



*A cost effective alternative  
for analog cellular, SSB,  
paging and mobile radio  
testing*

## 1200 Super S Communications Service Monitor



- Analog meter and VFD (Vacuum Fluorescent Display) offer high visibility in all lighting conditions
- Convenient service analyzer with duplex and simplex connectors
- Standard internal spectrum analyzer to 1 GHz
- Built-in 1 MHz oscilloscope
- Comprehensive testing of analog and advanced digital paging with the AC510 option

### RF Solutions

Designed for land mobile professionals with demanding RF testing requirements, the 1200 Super S has a sensitive 2  $\mu$ V triple conversion receiver capable of monitoring AM, FM and SSB carriers within the low band, VHF, UHF and high band ranges.

Depending on your specific needs, the 1200 Super S also gives you the choice of receiving straight "off the air" or through a direct connection to a T/R port.

Recognized for its versatility, the 1200 Super S supports DCS, DTMF and pulsed audio signaling formats.

The 1200 Super S also meets RF measurement needs for:

- RF frequency error
- RF power
- Audio frequency error
- CTCSS frequency
- CTCSS modulation

In duplex mode the 1200 Super S is capable of simultaneously generating and

receiving frequency offsets in 2.5 kHz steps. The duplex feature can be configured to operate in three modes:

- Testing using separate transmit and receive ports
- Testing using one common transmit/receive port
- "Off-the-air" duplex testing

With standard features like a 1000 MHz spectrum analyzer and built-in 1 MHz oscilloscope, the 1200 Super S virtually eliminates the need for costly additional equipment purchases. An optional tracking generator makes cable testing simple.

### Paging Solutions

The versatility of the 1200 Super S also allows comprehensive testing of the most popular paging protocols, including encode/decode or 2-tone sequential, 5/6 Tone testing..

For those involved with advanced paging protocol systems, the AC510 option supports the following paging standards:

- Flex
- POCSAG
- Golay Sequential Code (GSC)
- NEC D3

### Trunking Solutions

With the CLEARCHANNEL LTR<sup>®</sup> trunking option, the 1200 Super S is an ideal platform for testing LTR mobiles, portables and repeaters. For basic repeater testing, the 1200 Super S allows you to perform extensive receiver and transmitter tests. For more in-depth analysis, the LTR test option emulates the repeater system and

allows testing of home repeater access and next repeater access, including Handshake and Hand-off operation.

In addition, with 760 trunking channels, an internal LTR tracking generator and user friendly LTR programming screens, the 1200 Super S is designed to give you the greatest control and flexibility possible.

### Complex Functionality That's Simple to Use

From the user interface to functions and displays, the 1200 Super S allows technicians of any skill level to fully utilize its vast testing resources.

- Intuitive user interface makes complex testing simple and efficient.
- CTCSS encode/decode feature makes it easy to work with sub-audible tones.
- A standard RS-232 port allows remote testing.
- Internal memory allows storage of up to 99 RF frequencies.

From programming automatic test sequences to executing standard measurements, the operating system of the 1200 Super S provides a high level of testing. Yet the 1200 Super S is so user-friendly, you'll spend less time setting up tests and more time testing.

# 1200 Super S

To receive a calibration and/or repair quote-RMA from R.A.E. Services Inc.  
Click here>> [www.raeservices.com/services/quote.htm](http://www.raeservices.com/services/quote.htm)

## Specification

### 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  
3.0 dB @ -20 dB attenuator setting

**Spectral Purity Harmonics**  
-30 dBc

**Spectral Purity Nonharmonics**  
-55 dBc

**IF Image**  
≤ -35 dB

**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

**Duplex Output Level**  
-40 dBm (Low), -15 dBm (High) into 50 Ω

**Input Protection**  
0.25 W

**T/R Port**  
-85 dBm ±10 dB fixed level

### Modulation

**Internal Frequency Modulation Range**  
0 to 50 kHz (1 kHz tone)

**FM Rate**  
10 Hz to 30 kHz (Internal)  
2 Hz to 30 kHz (External) (DC when in variable generate)

**FM Accuracy**  
±5% of reading, ±3% of full scale (1 kHz tone)

**FM Distortion**  
< 1% (to 20 kHz deviation)

**EXT MOD Sensitivity**  
0.1 VRMS/kHz (-0% + 30%)

**Amplitude Modulation Range**  
0 to 90%

**AM Rate**  
10 Hz to 10 kHz (30% maximum modulation above 5 kHz)

**AM Accuracy**  
±5% of reading, ±3% of full scale (1 kHz tone)

**AM Distortion**  
< 10% (to 60% modulation)

**EXT MOD sensitivity**  
0.01 VRMS (0% to +30%)

### Audio Generators

**Generator #1 Frequency Range**  
1 kHz

**#1 Accuracy**  
Same as Master Oscillator

**#1 Output Range**  
0 to 2.5 V (RMS, into 150 Ω)

**#1 Distortion**  
< 0.5%

**#1 Waveshape**  
Sine

**Audio Generator #2 Frequency Range:**  
10 Hz to 30 kHz

**#2 Resolution**  
0.1 Hz

**#2 Accuracy**  
±0.01%

**#2 Output Range**  
0 to 2.5 V (RMS, into 150 Ω)

**#2 Distortion (at 2.5 VRMS)**  
< 2% (10 Hz to 100 Hz) < 0.7% (100 Hz to 30 kHz)

**#2 Waveshapes**  
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

Mode	Rx BW	AF BW
FM WIDE	200 kHz	80 kHz
FM MID	200 kHz	8 kHz
FM NAR	15 kHz	3 kHz
SSB	6 kHz	3 kHz
AM NAR	6 kHz	3 kHz
AM NORM	15 kHz	8 kHz

### Adjacent Channel Rejection

Rx BW	BW > 40 dB Down
200 kHz	±300 kHz
15 kHz	±27 kHz
6 kHz	±12 kHz

### Demodulation Output

**AM Output Level**  
5 mV RMS/1%

**FM Output Level**  
60 mV RMS/1 kHz

**Impedance**  
600 Ω

### 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 responding)

**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% at 1 kHz

**Accuracy**  
± 1% (at 10% distortion)

**Signal Frequency**  
1 kHz

**Input Level**  
0.25 to 2 VRMS

**Input Impedance**  
10 kΩ nominal

### SINAD Meter

**Range**  
3 to 20 dB at 1 kHz

**Accuracy**  
± 1 dB (at 12 dB SINAD)

**Signal Frequency**  
1 kHz

**Input Level**  
0.25 to 2 VRMS

**Input Impedance**  
10 kΩ nominal

### 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)**  
DC to 1 MHz

**Input Ranges**  
10 mV/div to 10 V/div (decade sequence)

**Horizontal Sweep Rate**  
10 msec/div to 10 μsec/div (decade sequence)

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**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 (0 to 50°C)

**Ageing**  
±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**  
332 mm (13.06 in) wide, 185 mm (7.3 in) high,  
445 mm (17.5 in) deep

**Weight**  
17.2 kg (38 lbs) without options

**0.05 ppm OCXO (Premium)**

**Stability**  
0.05 ppm/year (0 to 50°C)

**Generate Amplifier (Premium)**

**Gain**  
30 dB (±2 dB) typical, 250 kHz to 1000 kHz

**Test Set Output with Analyzer Installed**  
Variable to +10 dBm, FM and CW  
Variable to +4 dBm, AM

**Tracking Generator (Premium)**

**Frequency Range**  
1 to 999.9999 MHz

**Output Level**  
Track High -5 dBm (+2/-5 dB)  
Track Mid -15 dBm (±7 dB)  
Track Low -40 dBm (+5/-10 dB)

**Flatness**  
±1 dB over center 30% of display  
±5 dB over remaining display

**Tracking Span**  
10 kHz to 10 MHz

**Output Impedance**  
50 Ω (nominal)

**Spurious**

Harmonic and non harmonic are <5 dBc, <10 dB typical  
Image (RF + 180 MHz) 0 dB typical

**Dynamic Range**  
70 dB

**Tracking Range**  
200 Hz to 1.0 kHz

**Versions and Accessories**

When ordering please quote the full order number information

**Ordering**

Numbers	Versions
1200SS-110	1200 Super S, 110 VAC
1200SS-110-C	1200 Super S, 110 VAC with Certificate of Calibration
1200SS-220	1200 Super S, 220 VAC operation
1200SS-220-C	1200 Super S, 220 VAC with Certificate of Calibration
1200SSH-110	1200 Super S Hi Stability (0.05 ppm OCXO time base, tracking generator) 110 VAC operation
1200SSH-110-C	1200 Super S Hi Stability, 110 VAC, Cert. Cal
1200SSH-220	1200 Super S Hi Stability, 220 VAC operation
1200SSH-220-C	1200 Super S Hi Stability, 220 VAC with Certificate of Calibration

**Accessories**

AC0002	Soft padded carrying case
AC0488	IEEE-488 (in lieu of RS-232C not avail. with 1200SSP or AC0450)
AC0489	CLEAR CHANNEL LTR
AC510	Paging encoder
AC1201	Telescopic antenna
AC1205	Microphone
AC2200	Maintenance manual
AC2201	Rack mounting kit
AC4101	Return loss bridge 5 MHz to 1 GHz (req. 1200 Super S Premium)
AC5249	Generate Amplifier +30 dBm

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