

Receiver Dynamic Testing (unless otherwise specified all dynamic range measurements are taken at the ARRL lab standard spacing of 20 kHz.)

Noise floor (mds), 500 Hz filter	Frequency	Preamp off	Preamp one	Preamp two
	1.0 MHz	-130 dBm	-137 dBm	-140 dBm
	3.5 MHz	-133 dBm	-141 dBm	-143 dBm
	14 MHz	-132 dBm	-138 dBm	-142 dBm
	50 MHz	-127 dBm	-136 dBm	-140 dBm
AM sensitivity, 10 dB (S+N)/N, 1-kHz tone, 30% modulation	Frequency	Preamp off	Preamp one	Preamp two
	1.0 MHz	1.7 μ V	0.8 μ V	0.6 μ V
	3.8 MHz	1.2 μ V	0.6 μ V	0.4 μ V
	53 MHz	2.4 μ V	1.0 μ V	0.5 μ V
FM sensitivity, for 12 dB SINAD	Frequency	Preamp off	Preamp one	Preamp two
	29 MHz	0.5 μ V	0.2 μ V	0.2 μ V
	52 MHz	1.0 μ V	0.4 μ V	0.2 μ V
Blocking dynamic range, 500 Hz filter	Frequency	Preamp off	Preamp one	Preamp two
	3.5 MHz	122 dB	120 dB	115 dB
	14 MHz	122 dB	120 dB	113 dB
	50 MHz	119 dB*	119 dB*	111 dB*
Two-tone, third order IMD dynamic range, 500 Hz filter	Frequency	Preamp off	Preamp one	Preamp two
	3.5 MHz	91 dB	89 dB	87 dB
	14 MHz	88 dB*	86 dB	87 dB
	50 MHz	88 dB*	86 dB*	84 dB*
Third-order intercept	Frequency	Preamp off	Preamp one	Preamp two
	3.5 MHz	+3.6 dBm	-7.7 dBm	-13 dBm
	14 MHz	-0.3 dBm	-9.1 dBm	-17 dBm
	50 MHz	+4.9 dBm	-7.1 dBm	-14 dBm
Second-order intercept		Preamp off	Preamp one	Preamp two
		+60 dBm	+65 dBm	+51 dBm
FM adjacent channel rejection	20 kHz channel spacing, both preamps on: 29 MHz, 67 dB; 52 MHz, 60 dB			
FM two-tone, third-order IMD dynamic range	20 kHz channel spacing, both preamps on: 29 MHz, 67 dB*, 52 MHz, 70 dB* 10 MHz channel spacing, both preamps on: 52 MHz, 106 dB			
S-meter sensitivity, S9 signal at	Frequency	Preamp off	Preamp one	Preamp two
	14.2 MHz	82 μ V	31 μ V	9.5 μ V
	50 MHz	178 μ V	60 μ V	20 μ V
Squelch sensitivity, at threshold, both preamps on	SSB, 16 μ V; FM, 29 MHz, 0.08 μ V, FM 52 MHz, 0.2 μ V			
Receiver audio output	2.3 W at 10% THD into 8 Ω			
IF/audio response: Range at -6 dB points, (bandwidth)	CW-N: (500 Hz filter): 221-972 Hz (751 Hz) CW-W: 67-2625 Hz (2558 Hz) USB-W: 87-2591 Hz (2504 Hz) LSB-W: 64-2597 Hz (2533 Hz) AM: 66-2510 Hz (2444 Hz)			
Spurious and image rejection	First IF rejection: 14 MHz, 81 dB Image rejection: 14 MHz, 72 dB			

Frequency coverage: 0.03 – 60 MHz (Sensitivity reduced below 0.06 MHz). **DC current drain:** 2 A. Tested at 13.8 V.

Modes of operation: SSB, CW, AM, S-AM, FM, AFSK. **Size** (hwd): 3.7x9.5x9 inches. **Weight:** 6.6 pounds.

* Measurement was noise-limited at the value indicated.

Receiver Dynamic Testing (unless otherwise specified all dynamic range measurements are taken at the ARRL lab standard spacing of 20 kHz.)

Minimum discernible signal (Noise floor), 500 Hz filter	Frequency	
	1.0 MHz	-135 dBm
	3.5 MHz	-138 dBm
	14 MHz	-135 dBm
AM sensitivity, 10 dB (S+N)/N, 1-kHz tone, 30% modulation	Frequency	
	1.0 MHz	0.45 μ V
	3.8 MHz	0.35 μ V
FM sensitivity, for 12 dB SINAD	Frequency	
	29 MHz	0.32 μ V
Blocking dynamic range, 500 Hz filter	Frequency	
	3.5 MHz	128 dB*
	14 MHz	125 dB*
Two-tone, third order IMD dynamic range, 500 Hz filter	Frequency	
	3.5 MHz	92 dB
	14 MHz	91 dB
Third-order intercept	Frequency	
	3.5 MHz	+3.1 dBm**
	14 MHz	+4.5 dBm**
Second-order intercept	+73 dBm	
FM adjacent channel rejection	20 kHz channel spacing: 29 MHz, 78 dB	
FM two-tone, third-order IMD dynamic range	20 kHz channel spacing: 29 MHz, 78 dB*	
S-meter sensitivity, S9 signal at	Frequency	
	14.2 MHz	69 μ V
Squelch sensitivity, at threshold	SSB, 14 MHz, 0.34 μ V; FM, 29 MHz, 0.46 μ V	
Receiver audio output	2.7 W at 10% THD into 4 Ω	
IF/audio response: Range at -6 dB points, (bandwidth)	CW-N: (500 Hz filter): 555-1091 Hz (536 Hz)	
	CW-W: 274-2027 Hz (1753 Hz)	
	USB: 286-2874 Hz (2588 Hz)	
	LSB: 283-2879 Hz (2596 Hz)	
	AM: 243-1954 Hz (1711 Hz)	
Spurious and image rejection	First IF rejection: 14 MHz, 109 dB	
	Image rejection: 14 MHz, 113 dB	

Frequency coverage: 0.1 – 30 MHz (0.1 MHz – 2 Ghz with optional CHE-199 wideband converter – cellular phone frequencies are blocked).

DC current drain: 1.3 A. Tested at 13.8 V. **Modes of operation:** SSB, CW, AM, FM, AFSK. **Size** (hwd): 5.1x13.0x11.2 inches. **Weight:** 16.5 pounds.

* Measurement was noise-limited at the value indicated.

** Third-order intercept points were determined using S5 reference.

Receiver Dynamic Testing

Minimum discernible signal (Noise floor), 500 Hz filter	Frequency	
	1.0 MHz	-126 dBm
	3.5 MHz	-129 dBm
	14 MHz	-127 dBm
AM narrow sensitivity, 10 dB (S+N)/N, 1-kHz tone, 30% modulation	Frequency	
	1.0 MHz	1.4 μ V
	3.8 MHz	2.4 μ V
Blocking dynamic range, 500 Hz filter	Frequency	
	3.5 MHz	105 dB*
	14 MHz	108 dB*
Two-tone, third order IMD dynamic range, 500 Hz filter	Frequency	
	3.8 MHz	91 dB*
	14 MHz	90 dB
Third-order intercept	Frequency	
	3.8 MHz	+12.6 dBm
	14 MHz	+11.0 dBm
Second-order intercept	+52 dBm	
Receiver audio output	3.6 W at 2% THD into 8 Ω	
IF/audio response: Range at -6 dB points, (bandwidth)	USB:	329-2911 Hz (2582 Hz)
	LSB:	324-3095 Hz (2771 Hz)
	AM:	340-2512 Hz (2172 Hz)
Spurious and image rejection	IF rejection:	68 dB
	Image rejection:	86 dB

Frequency coverage: 0.1 – 30 MHz. **Modes of operation:** AM, SSB, CW.

DC current drain: 1.2 A. (max volume, no signal), tested at 13.8 V. **Size** (hwd): 2.6x8.3x7.7 inches. **Weight:** 2.2 pounds.

* All dynamic range measurements were taken using the ARRL lab standard spacing of 20 kHz. Third-order intercept points were determined using S5 reference.

T e n T e c R X - 3 2 0

QST, March 1999
Measured in the ARRL Lab

Receiver Dynamic Testing

Minimum discernible signal (Noise floor), 500 Hz filter	Frequency	
	1.0 MHz	-117 dBm
	3.5 MHz	-133 dBm
	14 MHz	-134 dBm
AM sensitivity, 10 dB (S+N)/N, 1-kHz tone, 30% modulation	Frequency	
	1.0 MHz	7.4 μ V
	3.8 MHz	1.36 μ V
Blocking dynamic range, 500 Hz filter	Frequency	
	3.5 MHz	111 dB*
	14 MHz	109 dB*
Two-tone, third order IMD dynamic range, 500 Hz filter **	Frequency	
	3.5 MHz	84 dB*
	14 MHz	82 dB*
Third-order intercept **	Frequency	
	3.5 MHz	-7.4 dBm
	14 MHz	-10.7 dBm
Second-order intercept	-29 dBm	
S-meter sensitivity, maximum indication at	Frequency	
	14.2 MHz	484 μ V
Receiver audio output	2.9 W at 10% THD into 4 Ω	
IF/audio response: Range at -6 dB points, (bandwidth)	CW-N: (500 Hz filter): 769-1250 Hz (481 Hz)	
	CW-W: 794-3333 Hz (2539 Hz)	
	USB: 118-2667 Hz (2549 Hz)	
	LSB: 111-2667 Hz (2556 Hz)	
	AM: 67-3793 Hz (3726 Hz)	
Spurious and image rejection	First IF rejection: 14 MHz, 54 dB	
	Image rejection: 14 MHz, 102 dB	

Frequency coverage: 0.1 – 30 MHz (Specification table states “degraded performance below 1 Mhz”). **Modes of operation:** AM, SSB, CW.

DC current drain: 0.33 A. tested at 13.8 V. **Size** (hwd): 3.0x6.3x6.5 inches. **Weight:** 2.5 pounds.

Unless otherwise noted, all dynamic range measurements were taken at the ARRL lab standard spacing of 20 kHz.

* Measurement was noise-limited at the value indicated.

** Two-tone, third order IMD and Third-order intercept [manufacturer] specifications were met. These are: Third-order intercept of +10 dBm, and Two-tone third order IMD dynamic range of 90 dB. These figures are based on a 2.4 kHz bandwidth and 50 kHz spacing.

Grundig Satellit 800 Millennium

QST, October 2000
Measured in the ARRL Lab

Receiver Dynamic Testing

Minimum discernible signal (Noise floor), 2.3 kHz filter	Frequency	
	1.0 MHz	-126 dBm
	3.5 MHz	-124 dBm
	14 MHz	-125 dBm
AM sensitivity, 10 dB (S+N)/N, 1-kHz tone, 30% modulation	Frequency	
	1.0 MHz	1.3 μ V
	3.8 MHz	3.2 μ V
	120 MHz	3.4 μ V
FM sensitivity, for 12 dB SINAD, 15 kHz bandwidth	Frequency	
	100 MHz	1.2 μ V
Blocking dynamic range, 2.3 kHz filter	Frequency	
	3.5 MHz	103 dB*
	14 MHz	110 dB*
Two-tone, third order IMD dynamic range, 2.3 kHz filter	Frequency	
	3.5 MHz	84 dB*
	14 MHz	89 dB*
Third-order intercept	Frequency	
	3.5 MHz	+2.0 dBm
	14 MHz	+8.4 dBm
Second-order intercept	+90.7 dBm	
S-meter sensitivity, S9 signal at	Frequency	
	1.0 MHz	81.2 μ V
	14.2 MHz	108 μ V
Squelch sensitivity, at threshold	AM, 120 MHz, 0.84 μ V	
Receiver audio output	1.4 W at 10% THD into 8 Ω	
IF/audio response: Range at -6 dB points, (bandwidth)	USB-W:	442-2307 Hz (1865 Hz)
	LSB-W:	436-2235 Hz (1799 Hz)
	AM:	360-2442 Hz (2082 Hz)
Spurious and image rejection	First IF rejection: HF, 67 dB; AM aircraft, 69 dB; FM broadcast, 89 dB.	
	Image rejection: HF, 48 dB; AM aircraft, 97 dB; FM broadcast, 62 dB.	

Frequency coverage: 0.1 – 30 MHz (SSB/AM), 87-108 MHz (FM), 118-137 MHz (AM). **Modes of operation:** AM, SSB, WFM. **DC current drain:** 0.53 A. tested at 9.0 V. dc**. **Size (hwd):** 9.3x20.9x8.5 inches. **Weight:** 14.6 pounds.

* Measurement was noise-limited at the value indicated.

**A 120/230 V. ac 60/50 Hz power supply is included.

Unless otherwise noted, all dynamic range measurements are taken at the ARRL lab standard spacing of 20 kHz.

Third-order intercept points were determined using noise floor reference.

QST, August 1997
 Measured in ARRL Lab

Grundig
 Yacht Boy 400

Sangean ATS-909 /
 Radioshack DX-398

Sony
 ICF-2010

Minimum discernible signal (Noise floor)	Frequency			
	180 kHz	7.24 μ V	0.14 μ V	1.64 μ V
	1.0 MHz	0.8 μ V	0.06 μ V	0.58 μ V
	14 MHz	0.08 μ V	0.06 μ V	0.04 μ V
AM sensitivity, 10 dB (S+N)/N, 1-kHz tone, 30% modulation				
	1.0 MHz	6.02 μ V	0.67 μ V	9.99 μ V
	14 MHz	1.44 μ V	0.71 μ V	0.78 μ V
	120 MHz	--	--	1.55 μ V
Blocking dynamic range, SSB mode				
	14 MHz	78 dB	85 dB	112 dB
Two-tone, third order IMD dynamic range, SSB mode				
	14 MHz	76 dB	80 dB*	82 dB
FM Sensitivity, 12 dB SINAD				
	100 MHz	1.64 μ V	1.8 μ V	1.15 μ V

Except as noted, all dynamic range measurements were taken using the ARRL lab standard spacing of 20 kHz.

* noise limited.

Grundig Yacht Boy 400

Frequency coverage: AM, SSB, 144-353 kHz; 0.52-30 MHz. FM, 87.5-108 MHz. **Modes of operation:** AM, FM, SSB (CW).

Power requirements: 9 V at 110 mA. **Size** (hwd): 4.75x7.75x1.375 inches. **Weight:** 1 pound, 12 oz (with carrying case and batteries).

All measurements were made with the **DX/LOCAL** switch set to **DX**, the **NARR/WIDE** switch set to **NARR**, and the **TONE** switch set to "high".

Sangean ATS-909 / Radioshack DX-398

Frequency coverage: AM, SSB, 153-1710 kHz; 1.7-30 MHz. FM, 87.5-108 MHz. **Modes of operation:** AM, FM, SSB (CW).

Power requirements: 6 V at 78 mA. **Size** (hwd): 5.5x8.5x1.5 inches. **Weight:** 2 pounds, 2 oz (with carrying case and batteries).

All measurements were made with the **AM RF GAIN** control set to maximum, the **NARR/WIDE** switch set to **NARR**, and the **TONE** switch set to "music".

Sony ICF-2010

Frequency coverage: AM, SSB, 0.15-30 MHz. FM, 76-108 MHz. Aircraft AM, 116-136 MHz. **Modes of operation:** AM, FM, SSB (CW).

Power requirements: 4.50 V at 150 mA. **Size** (hwd): 6.5x11.25x1.75 inches. **Weight:** 3 pounds, 8 oz (with batteries).

All measurements were made with the **DX/LOCAL** switch set to **DX**, the **AM RF GAIN** control set to maximum, the **NARROW** switch enabled, and the **TONE** switch set to "high".