



# SS-IBS

INTERNATIONAL BROADCAST RECEIVER



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SQUIRES-SANDERS, INC., Millington, N. J. U.S.A.

# SS-IBS INTERNATIONAL

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### High Performance Communications Receiver — explicitly designed for operation on the International Broadcast Bands

The SS-IBS International Broadcast Receiver is a completely new high performance communications receiver explicitly designed for use on the high frequency broadcast bands between 3.5 and 26.1 megacycles. The SS-IBS receiver is *unique* in its ability to receive weak signals located only a few kilocycles away from powerful broadcasts. The SS-IBS features unusual simplicity of operation, allowing relatively unskilled individuals to achieve results of professional quality; yet it provides performance characteristics and operating controls which will improve reception at the hand of an experienced operator. SS-IBS may be used with accessory speaker or headphones for monitoring and has suitable output connection for recording, direct rebroadcast, and visual band monitoring with the SS-1V Video Bandscanner. Exploiting a new approach to front-end design, the receiver attains extreme freedom from cross-modulation and overload while obtaining signal-to-noise ratios, or sensitivities, superior to most contemporary communications equipment.

Frequency precision and stability are of such a high order that digital display of frequency — with  $\pm 1$  kc. absolute accuracy — is provided.

A crystal bandpass filter with exceptional skirt selectivity is used for SSB and narrow — AM reception, while newly developed IF tuned circuits provide great ultimate attenuation and excellent shape factors for broad and normal AM reception. Provision is made for exalted carrier reception.

This unique receiver design provides for a fixed tuned position at 10.0 MC for calibration with WWV plus an auxiliary band from 5.0 to 5.5 MC (for WWV at 5.0 MC). Additionally a 100 kc. crystal calibrator provides check points on all bands making possible highly accurate calibration at any frequency.

The SS-IBS is designed for use with an optional noise silencer (SS-1S) of extreme effectiveness on impulse noise. An optional video oscilloscope display (SS-1V Video Bandscanner) of unique design showing the full 500 kc. band (or any part) in use — as well as a marker indicating the exact frequency to which the receiver is tuned — can be added.

Standby and Mute provisions permit the receiver to be used with most transmitters if such operation is desired.

### OPERATING and PERFORMANCE FEATURES

**Dial Calibration.** Since the precision and stability of the SS-IBS represents a major advance in HF equipment, *digital readout* to the nearest kilocycle is provided. The front-end employs precision crystals for the first conversion, while a high-stability VLO (Variable Local Oscillator), employing a precise tuning capacitor of linearity exceeding that of most frequency meters, establishes the second conversion frequency. The slide rule dial simply indicates the nearest 100 kc., while the digital display reads 0 to 99 kilocycles directly.

**Selectivity.** Three bandwidths are available, independent of the AM/LSB/USB/BFO function. The 8 kc. and 5 kc. bandwidths are most useful for AM and are obtained through very high Q IF bandpass elements. The 2.5 kc. bandwidth is most suitable for SSB or exalted-carrier AM reception, and is obtained with a bandpass crystal filter having a 60/6 db shape factor of only 2:1.

**Operational Modes.** All modes are under complete control of the operator. When operating AM, for example, the operator can select fast, slow or no AGC, any one of three bandwidths, and use either injection frequency (USB or LSB) for exalted carrier reception (which reduces the noise and distortion associated with selective fading). The IF limiter provides protection against static pulses, and on occasions when CW reception is desired permits excellent adjustable threshold CW limiting.

**AGC.** A fast attack, slow release AGC can be used in all reception modes with two release time constants for optimum AM or SSB performance.

**ANL.** The automatic limiter, with adjustable threshold, operates in the IF on all modes. Unlike audio limiters it will establish automatic threshold on SSB as well as AM.

**Bandswitch and Frequency Display.** A twelve position, 360° continuous bandswitch controls the positioning of a drum dial in the band-in-use window of the frequency display. This drum indicates the fixed (10 MC) WWV position plus a 500 kc. scale for each of the International Broadcast bands. The slide rule pointer indicates the nearest 100 kc. position. Counters are used for digital display of kilocycles 0 to 99 and are driven directly from the main tuning shaft through low-backlash helical gears.

**Tuning Mechanism.** A very slow manual tuning rate (10 kc. per knob revolution) has been provided for easy and exact tuning. This is achieved by a precision anti-backlash worm wheel and drive providing extremely smooth "feel" and very accurate positioning.

**Motor Driven Tuning.** Fast traverse across a band is accomplished by push-button motor drive which is clutch-disengaged from the tuning mechanism in manual mode.

**Cabinet.** The SS-IBS cabinet design is a unique combination of simple but rugged construction and conservative styling. A custom, heavy-gage aluminum extrusion is used for the one piece front panel and sides, providing unusual rigidity. The heavy chassis plate installs firmly in extruded ways and is completely accessible from both top and bottom when the perforated dust cover (top, back and bottom) is removed.

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# L B R O A D C A S T R E C E I V E R

## SPECIFICATIONS

### Frequency Coverage

Band	"Meters"	Int. Broadcast Band MC	Total Coverage, MC
1	75	4.000 - 33.950	4.000 - 3.500
2	49	6.200 - 5.950	6.400 - 5.900
3	41	7.100 - 7.300	7.000 - 7.500
4	31	9.775 - 9.500	10.000 - 9.500
5	25	11.975 - 11.700	12.000 - 11.500
6	19	15.100 - 15.450	15.000 - 15.500
7	16	17.700 - 17.900	17.500 - 18.000
8	13	21.450 - 21.750	21.400 - 21.900
9	12	25.600 - 26.100	25.600 - 26.100
10	WWV Fixed Tuned at 10.0 MC AUX - Internal - 5.0 - 5.5 MC		

Note: Positions 11 and 12 are not used.

### Selectivity

#### Nominal Bandwidths in Kilocycles

	-6 db	-60 db
A.	8.0	32
B.	5.0	25
C.	2.5	5.0

**Sensitivity.** Less than 0.5 microvolt for 10 db S+N/N in 2.5 kc. bandwidth (measured with unmodulated carrier in SSB mode). Note: on the 7.000 - 7.500 MC band, where single-conversion is used, sensitivity is less than 1.0 microvolt.

**Frequency Stability.** Less than 500 cps drift from cold start. Typical warm-up time is less than 5 minutes. Less than 100 cps frequency change in any one hour period thereafter, including  $\pm 10\%$  line voltage variations.

**Frequency Accuracy.**  $\pm 1$  kc. maximum error.

**IF and Image Rejection.** Greater than 60 db.

**Internal Spurious.** Less than 0.5 microvolt equivalent (except at 6.200 and 12.0 MC where internal spurious may approach 10 to 15 microvolt equivalent).

**Cross Modulation.** When receiving a 10 microvolt signal with 2.5 kc. selectivity, an unwanted 50 millivolt signal 20 kc. away will produce negligible cross modulation. In any mode, when receiving a 1.0 microvolt signal, an unwanted 0.25 volt signal 100 kc. away will produce not more than 3 db signal reduction.

**AGC Time Constants.** Attack 1 millisecond  
Fast Release 0.1 second  
Slow Release 1.0 second

**Audio Output.** 1 watt at less than 10% distortion into 4 or 500 ohms, 2 watts maximum. AF auxiliary output jack may be used to drive a tape recorder or other audio amplifier. Level of this high impedance (approx. 1 megohm) output is nominally 1 volt with a 50 microvolt 30% modulated AM input signal. The output level is not affected by the AF Gain Control setting.

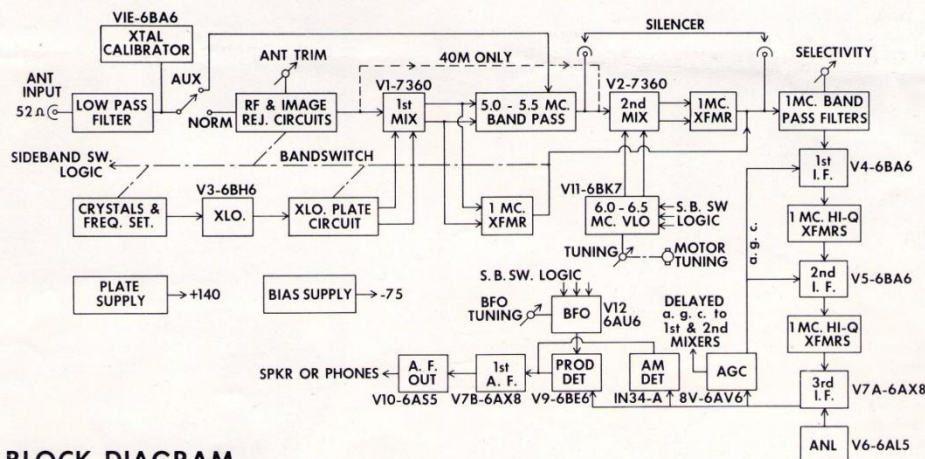
**Antenna Input.** 52 ohms nominal, accepts UG-88/U connector.

**Mute.** Provision is made for muting the receiver on transmit when used with a transmitter. External contacts open on transmit, closed on receive, are required. Function switch must be in STANDBY position.

**Size and Weight.** 7- $\frac{3}{4}$ " high x 16- $\frac{1}{4}$ " wide x 13" deep. 25 pounds.

**Power Input.** 115/230 V AC  $\pm 10\%$ , 50/60 cps, 55 watts.

**Tubes and Diodes.** 13 tubes, 7 germanium diodes, 3 silicon rectifiers.



BLOCK DIAGRAM

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e Road, Millington, New Jersey, U.S.A.

## MATCHING SYSTEM COMPONENTS

**SS-1V, Video Bandsanner.** This unique oscilloscope display unit, when used with the SS-IBS, shows all signals in the band in use, or any portion of the band can be expanded to full screen for detailed examination. Both linear and logarithmic displays are provided. A unique feature is that the receiver signals displayed *do not move* as the receiver is tuned, but a marker pip constantly shows the exact frequency to which the receiver is tuned. The sharp resolution of this unit permits observation and measurement of two AM sidebands displaced only 2.5 kc. from the carrier. In addition provision is made for transmitter monitoring or analysis with automatic switching on "transmit".



SS-1V



RACK MOUNT

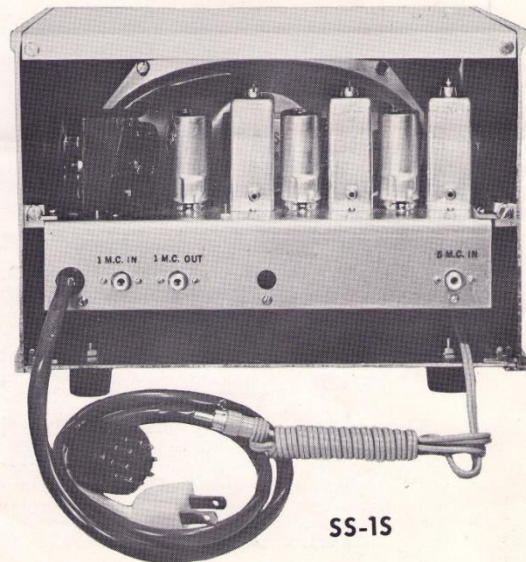
**Rack Mount.** The Rack Mount provides an easy and efficient method for mounting the SS-IBS or the SS-1V in a standard 19" mounting rack. The mount is a drawer type mount and care should be taken to see that antenna and other interconnecting cables will reach even when the drawer is pulled out. The SS-IBS Receiver (or the SS-1V Bandsanner) mounts in the rack drawer without removal of dust cover.



SS-1RS

**SS-1RS, Matching Speaker.** A 4 ohm, 4 x 8 speaker, housed in matching extruded cabinet.

**SS-1S, Noise Silencer.** The SS-1S Noise Silencer provides for virtually complete elimination of impulse noise. This radically new development makes possible solid copy of barely detectable signals (S2 or less) even in the presence of S9 or greater impulse noise caused by ignition, neon signs, switches, power leaks, etc. Provision is made for neatly housing the silencer unit in matching speaker cabinet.



SS-1S

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