

185.00

WJ-8709 HF RECEIVER



FEATURES

- Half Rack General Purpose HF Receiver
- Single or Dual 19" Rack Mount Capability
- Frequency Coverage from 5.0 kHz to 30 MHz in One Band
- Fully Synthesized Including BFO
- Five IF Bandwidths Up to 16 kHz
- AM, FM and CW Detection Modes STD, USB and LSB as Options
- Modular Construction for Low MTTR and High MTBF
- High Dynamic Range
- IEEE-488 and RS-232C/MIL-188C Remote Control Options
- Uses Proven WJ-8718 RF, IF and Synthesizer Modules

DESCRIPTION

The WJ-8709 is the Watkins-Johnson general purpose "Half Rack" HF Receiver for surveillance and monitoring of RF communications in the 5 kHz to 30 MHz frequency range. For ease of operation, operator designed controls provide: frequency tuning, IF Bandwidth, BFO (± 8 kHz), analog meter input, manual or AGC gain with slow or fast decay times, detection mode and line audio level selection. All controls are the conventional rotary type except BFO offset and tuning speed

which are pushbutton switches. A large meter is provided to indicate either signal strength or line audio level. Frequency is displayed on easy to read yellow LED indicators.

Several options are available to enhance the overall capability of the WJ-8709. Included in these options is SSB (Single Sideband) which provides upper and lower delay equalized single sideband filters. Sideband detection provides either upper or lower detection selectable from the front panel. When either of these detection modes are selected, equalized IF sideband filters are automatically switched to provide a separate detection path, and the BFO is automatically set at the proper injection frequency to recover the intelligence. The optional SMO (Signal Monitor Output) provides wideband (28 kHz, min.) 455 kHz IF output to drive a signal monitor or other signal processor. The FSK (Frequency Shift Keying) option provides demodulation of Binary FSK Signals and two remote control options, IEEE-488 and RS-232C, furnish comprehensive digital control. One to 15 WJ-8709 receivers may be used as handoff receivers when used with a WJ-8718A Receiver with a microprocessor front panel option installed and common I/O interfaces in all receivers.

Predetection IF output is provided by a BNC connector, as is a 1 MHz reference output. The reference output may be switched to accept a 1 MHz input.

The receiver is housed in a standard half-rack package which is supplied with a unique rack mount adapter kit.

SPECIFICATIONS

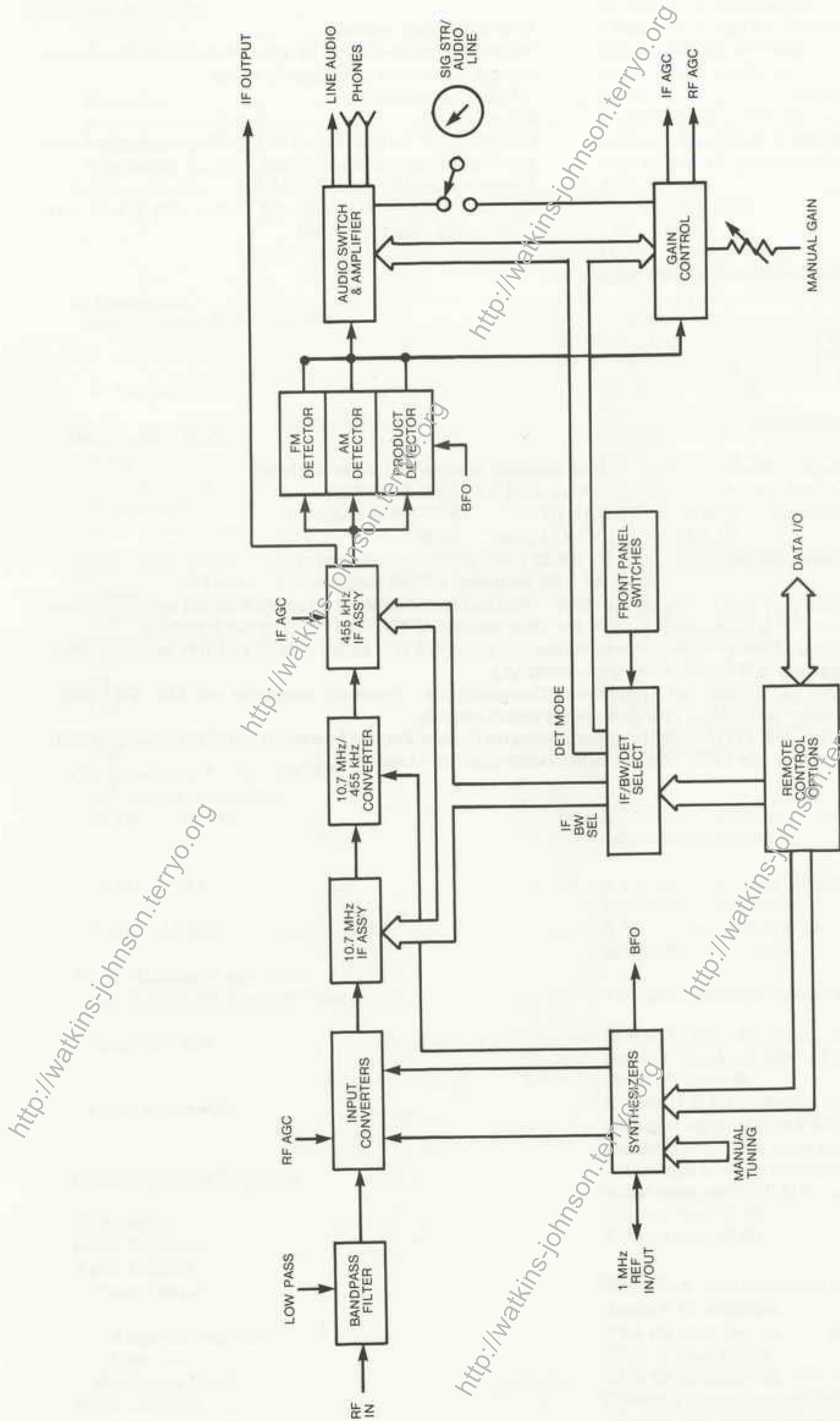
Tuned Frequency	5.0 kHz to 29.99999 MHz
Display	7 Digit yellow LED 3/8 inch high
	100 Hz step, 12 kHz/turn
	10 Hz step, 1.2 kHz/turn
	10 Hz
Resolution	6×10^{-8} /day, 2×10^{-6} /year
Stability (Internal Reference)	1 MHz, 50 to 500 m V rms into 50 Ω
External Reference	3 ms typical, 10 ms maximum
Synthesizer Lock-up Time	AM: A3-A4A
Detection Modes	FM: F1-F2-F3-F4
	CW: A0-A1
	MCW: A2-A4A
	USB, LSB (A3A-A3H-A3J-A2A-A2H-A2J)
IF Bandwidths	5 standard front panel selected
Shape Factor (3 dB to 60 dB)	minimum 3 dB bandwidth indicated
	0.3 kHz 1kHz 3.2 kHz 6 kHz 16 kHz
	7.0:1 4.5:1 3.0:1 2.6:1 2.4:1
IF Output	455 kHz 20 m V minimum into 50 Ω for an input signal greater than 3 μ V
Gain Control Mode	Manual, AGC fast and slow
Range	100 dB, minimum
AGC threshold	3.0 μ V, typical
AGC attack time	15 ms typical
AGC release time	Fast - 25 ms maximum
	Slow - 4 seconds maximum
BFO	± 8 kHz range
Display	2 digit
Resolution	100 Hz (see options list)
Sensitivity, 200 kHz - 30 MHz	IF BW Input Signal (S+N)/N at Audio Out
CW	0.3 kHz 0.40 μ V 16 dB
AM	6 kHz 1.7 μ V/50% mod. 400 Hz 10 dB
FM	16 kHz 2.5 μ V/400 Hz mod. 4.8 kHz peak dev. 17 dB
SSB	(See option List)
CW Sensitivity, 5 kHz - 200 kHz (0.3 kHz IF Bandwidth)	
50 kHz - 200 kHz	A 0.63 microvolt signal will produce at least a 16 dB (S+N)/N ratio at the Audio output.
15 kHz - 50 kHz	A 1.4 microvolt signal will produce at least a 16 dB (S+N)/N ratio at the Audio output.
5 kHz - 15 kHz	A 63 microvolt signal will produce at least a 16 dB (S+N)/N ratio at the Audio output.
Signal Handling Capabilities	
3rd Order Input Intercept Point	+20 dBm, minimum for signals separated by 30 kHz.
Reciprocal Mix	IF BW 3.2 kHz, desired sig. of 25 μ V (-79 dBm) with undesired signal of 79 m V (-9 dBm) Δ f from desired > 30 kHz, produces (S+N)/N \geq 20 dB.
Cross Modulation	IF BW 1.0 kHz, desired signal of 10 μ V (-87 dBm) with undesired signal 31.6 m V (-17 dBm) Δ f from desired > 50 kHz and 30% AM, 10% cross modulation.
Internal Spurious Responses	All internal spurious responses are less than -114 dBm referred to the input above 50 kHz tuned frequency.
IF Rejection	Greater than 90 dB
Image Rejection	Greater than 90 dB
Audio Outputs	
Power Output	For a 3 μ V 30% modulated AM signal 600 Ω unbalanced Line Audio 1 W minimum.
Amplifier response	± 1.5 dB from 100 Hz to 8 kHz, 1 kHz reference frequency
Distortion	< 5% at rated output
Headphone Output	30 m W minimum into 600 ohm phones.
Power Interrupt	Operating parameters are retained during power interrupts up to 48 hours and restored upon resumption of power.
Analog Metering	Front panel selectable line audio or signal strength monitoring.

Antenna Input	
Impedance	50 Ω unbalanced, nominal
Protection	Will withstand the effects of RF power up to +30 dBm and static buildup. The circuit automatically resets.
Conducted Oscillator Radiation	-80 dBm, maximum
Operating Temperature Range	0°C to +50°C
Power Requirements	115/220 VAC \pm 15%, 48 - 410 Hz, 50 watts nominal with maximum options installed.
Weight	Approximately 30 pounds (15.75 kg)
Size	5.25 inches high (13.34 cm), 9.5 inches wide (24.13 cm), 21.75 inches deep (55.24 cm)

Note: All μ V measurements referenced to 50 Ω impedance.

WJ-8709 OPTIONS

Nomenclature	Description
WJ-8709/SSB	Single Sideband. Allows separate detection of upper and lower sidebands. Detection Modes: USB/LSB (A3A-A3H-A3J-A2A-A2H-A2J) Sensitivity: IF BW SIGNAL IN (S+N)/N at audio out 3.2 kHz .56 μ V (-112 dBm) 10 dB Filter Characteristics: 2950 Hz at 6 dB points minimum, equalized to 2000 μ S group delay. Bandpass ripple \pm 1.5 dB maximum. (60 dB Bandwidth, 4.7 kHz)
WJ-8709/FSK	Frequency Shift Keying Demodulator. Provides demodulation of binary FSK signals with shifts of less than 50 Hz to greater than 2000 Hz. (Not available if WJ-8709/SMO option installed.)
WJ-8709/SMO	Signal Monitor Output. An additional rear panel 455 kHz output with 28 kHz BW minimum. (Not available if WJ-8709/FSK option installed.)
WJ-8709/232	RS-232C Bidirectional Asynchronous Communication. Optionally compatible with MIL-STD-188C. Allows master/slave operation via dip switch selection.
WJ-8709/488-2	IEEE-488/1975 Parallel Interface utilizing the General Purpose Interface Bus (GPIB) defined in IEEE Standard 488-1975. This is a bidirectional interface. (Listen/Talk)



**WJ-8709 RECEIVER
SIMPLIFIED BLOCK DIAGRAM**