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198.10

**WJ-8718 HF RECEIVER**



**FEATURES**

- 5 kHz to 30 MHz Frequency Coverage
- AM, FM, CW, ISB, LSB and USB Reception Modes
- IF Bandwidths from 300 Hz to 16 kHz
- Exceptional Signal Handling Capability
- Meets the EMI Requirements of MIL-STD-461A
- Remote Control Options such as IEEE 488

**DESCRIPTION**

The WJ-8718 General Purpose HF Receiver is designed to be used in either a manual mode or with remote digital frequency control. The unit is capable of detecting AM, FM, CW, ISB, LSB and USB emissions (A1, A2, A3a, A3b, A3h, A3j, A4, F1, F2, F3 and F4) over the frequency range.

The WJ-8718 General Purpose HF Receiver uses a building block approach; certain features are available as options in order to increase the capabilities of the receiver. Also, an optional Remote Control Module or Manual Control Module is required for control of the

receiver mainframe. The receiver mainframe provides the following:

- 5 kHz to 30 MHz Frequency Coverage
- Seven Selectable IF Bandwidths from .3 to 16 kHz (including the ISB option)
- Seven-digit Green LED Frequency Display (Note 1)
- AM, FM and CW Detection Modes
- Low Phase Noise Frequency Synthesizers
- 10 Hz Tuning Steps
- Tunable Synthesized BFO ( $\pm 8$  kHz)
- Audio Level/Signal Strength Meter

Front panel controls on the WJ-8718 include Meter Select, BFO Offset, Detection Mode, Gain Mode, IF Bandwidth Select, Phone, Audio Level Adjust and RF Gain.

Plug-in options include:

- Remote Control Module (RCM)
- Manual Control Module (MCM)
- Remote/Manual Control Module (MCM-2)
- ISB Module (ISB)
- Sub-Octave Preselector Module (PRE)

The standard Remote Control Module allows remote digital BCD frequency control and IF Bandwidth selection via a 37-line parallel CMOS (5 volt) interface. Other control formats can be accommodated, such as IEEE 488 interface buss.

For Further Information Please Contact:

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Specifications subject to change without notice.

The Manual Control Module allows for front-panel frequency control with single knob tuning and four push-button selection of tuning speed (10 Hz, 100 Hz, 1 kHz or 10 kHz resolution), and a tuning disable pushbutton. The Manual Control Module also provides for automatic storage and return of the frequency data during power interrupt.

The ISB Module allows for detection of USB, LSB or ISB signals. The separate upper and lower sideband filters are group delay compensated. The BFO is automatically set to the proper injection frequency when any SSB detection mode is selected. The ISB mode features an automatic gain controlled IF amplifier, product detector and audio amplifier chain separate from the main signal path. The ISB upper sideband information appears at the Line Audio Output, the ISB lower sideband information appears at the ISB Audio Output.

The Sub-Octave Preselector Module provides improved second order intermodulation distortion performance of the basic receiver. The preselector filters are automatically selected from the internal RF frequency data information.

## SPECIFICATIONS

Tuning Range .....	5 kHz to 29.99999 MHz
Tuning Resolution .....	10 Hz
Antenna Conducted Oscillator Radiation .....	-87 dBm, maximum
Antenna Input Protection .....	The antenna input will withstand the effects of RF power to +15 dBm and static build-up. The protection circuit automatically resets.
Input Impedance .....	50 ohms, unbalanced, nominal
IF Bandwidths (3 dB) .....	Standard: 0.3, 1, 3.2, 6 and 16 kHz
IF Shape Factor .....	IF BW 60 dB:3 dB, Typical
	0.3 kHz 7.0:1
	1 kHz 4.5:1
	3.2 kHz 2.5:1
	6 kHz 2.3:1
	16 kHz 2.0:1
Detection Modes .....	Standard: AM, FM, CW
	Optional: LSB, USB, ISB
Gain Control Modes .....	Manual, Fast AGC, Slow AGC
AGC and Manual Range .....	100 dB, minimum
AGC Threshold .....	3.0 microvolt, typical
AGC Attack Time .....	15 ms, maximum
AGC Release Time .....	Fast AGC: 25 ms, maximum
	Slow AGC: 4 sec, maximum
Frequency Display .....	7 digit green LED (Note 1)
Frequency Resolution/Readout .....	10 Hz
Frequency Stability .....	$6 \times 10^{-8}$ per day, $2 \times 10^{-6}$ per year
Frequency Control .....	Manual or Remote options
Synthesizer Lock-Up Time .....	3 ms typical; 10 ms max.
Synthesized BFO .....	$\pm 8$ kHz in 100 Hz steps
Power Interrupt .....	With the Manual Control Module option, storage of the frequency data will automatically occur. Upon restoration of power, the receiver will return to the previously tuned frequency.
IF Rejection .....	Greater than 90 dB
Image Rejection .....	Greater than 90 dB

When ordering plug-in options for the WJ-8718 receiver, please specify as follows:

<u>Number to Order</u>	<u>Options</u>
WJ-8718/MCM-2†	Remote/Manual Control Module
WJ-8718/RCM†	Remote Control Module
WJ-8718/MCM†	Manual Control Module
WJ-8718/ISB	ISB Module
WJ-8718/PRE	Sub-Octave Preselector Module
WJ-8718/488-1	IEEE 488 Interface Buss - Listen Only
WJ-8718/RED	Red LED Frequency Display
WJ-8718/YEL	Yellow LED Frequency Display

Additional options can be accommodated if required. Available options include the following, please inquire for details:

WJ-8718/B10	10 Hz BFO
WJ-8718/SMO	Signal Monitor Output
WJ-8718/TTY	Teletype Output
WJ-8718/IFP	Indicating Front Panel

†Either RCM or MCM is required for receiver operation.

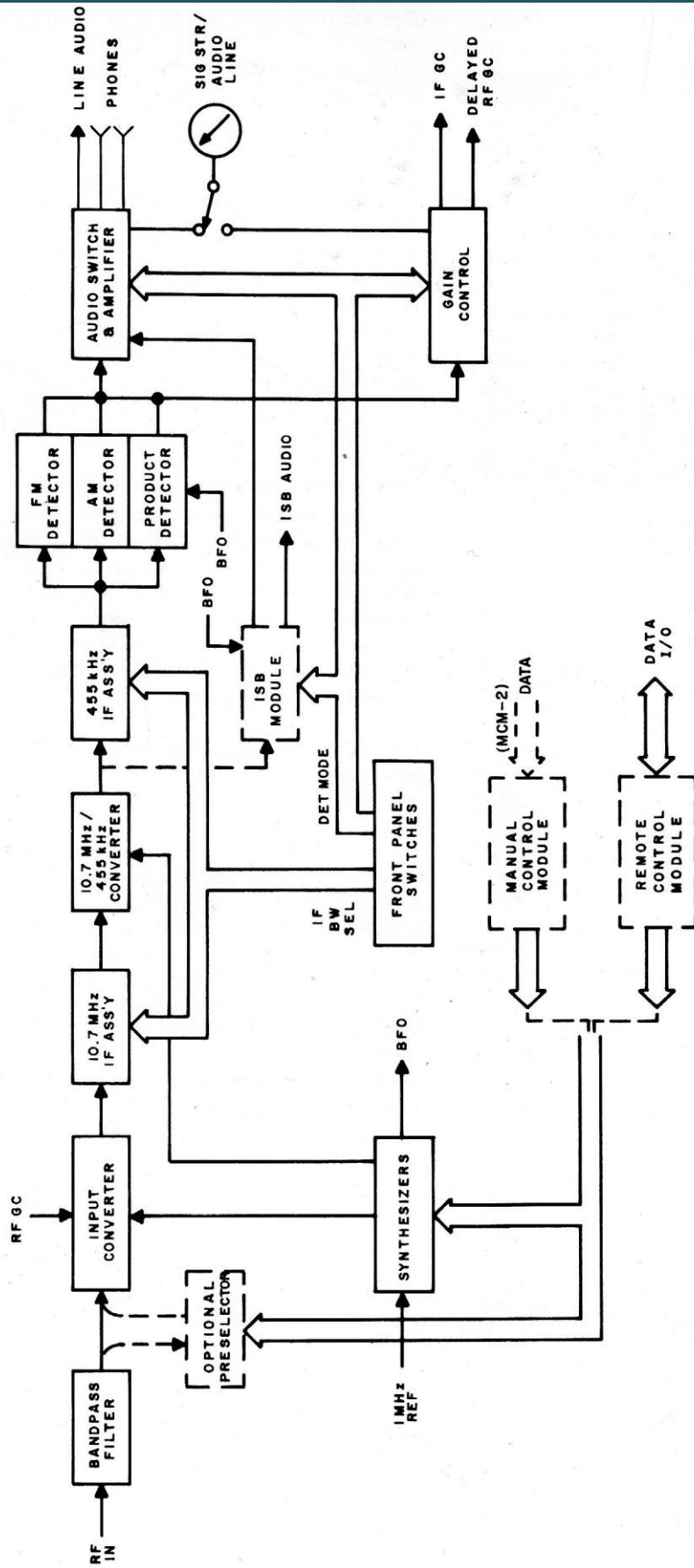


Sensitivity: (0.2-30 MHz, see CW Sensitivity for extended frequency range)	
AM Sensitivity (6 kHz IF Bandwidth)	A 1.7 microvolt signal 50% AM modulated at a 400 Hz rate will produce at least a 10 dB (s+n)/n ratio at the audio output.
FM Sensitivity (16 kHz IF Bandwidth)	A 2.5 microvolt signal FM modulated at a 400 Hz rate with a 4.8 kHz peak deviation will produce at least a 17 dB (s+n)/n ratio at the audio output.
CW Sensitivity (0.3 kHz IF Bandwidth)	
200 kHz-30 MHz	A 0.40 microvolt signal will produce at least a 16 dB (s+n)/n ratio at the audio output.
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 a 16 dB (s+n)/n ratio, typically at the audio output.
ISB, (USB, LSB) Sensitivity (3 kHz SSB Bandwidth)	A 0.56 microvolt signal will produce a 16 dB (s+n)/n ratio at the audio output.
Audio Outputs:	
ISB Output	100 milliwatts, minimum across 600 ohms
Line Audio	2 watts, minimum, across 600 ohms for an input signal of 3 microvolts, 30% AM modulated at a 400 Hz rate.
Headphone Output	30 milliwatts, minimum, for an input signal of 3 microvolts, 30% AM modulated at a 400 Hz rate. (Note 2)
Audio Distortion	Less than 5% at rated audio output
Audio Frequency Response	±1.5 dB from 100 Hz to 8 kHz, 1 kHz reference frequency
Final IF Output	20 millivolts, minimum, into 50 ohms for input signals greater than 3.0 microvolts
Intermodulation Distortion:	
3rd Order Input Intercept Point	+20 dBm, minimum for signals separated by 30 kHz, minimum
Unwanted Sideband Rejection	50 dB at 350 Hz into unwanted sideband
Signal Meter	Indicates carrier level or line audio level
Reciprocal Mixing	With a desired signal of 25 microvolts, in the 3.2 kHz IF bandwidth, the desired signal to noise ratio will be greater than 20 dB, when an undesired signal 70 dB higher in amplitude and removed 30 kHz in frequency is present.
Cross Modulation	With a desired signal of 10 microvolts, an undesired signal 70 dB higher, 30% AM modulated will produce less than 10% cross modulation for frequency separation of greater than 50 kHz in the 1 kHz IF bandwidth.
Operating Temperature Range*	0°C to 50°C
Power Consumption	Approximately 0.6 amps at 115 V ac
Power Requirements	115/220 V ac ±15% 48-420 Hz
Size	5.25 inches high, 19 inches wide and 19.4 inches deep
Weight	Approximately 35 pounds

Note 1. Red or Yellow display available as an option.

2. A stereo headset will provide 30 milliwatts for each sideband in the ISB mode. USB output available on the stereo phone "tip;" LSB output available on stereo phone "ring."

\*Operation within specifications guaranteed at 25°C +5°C



WJ-8718 RECEIVER MAINFRAME BLOCK DIAGRAM