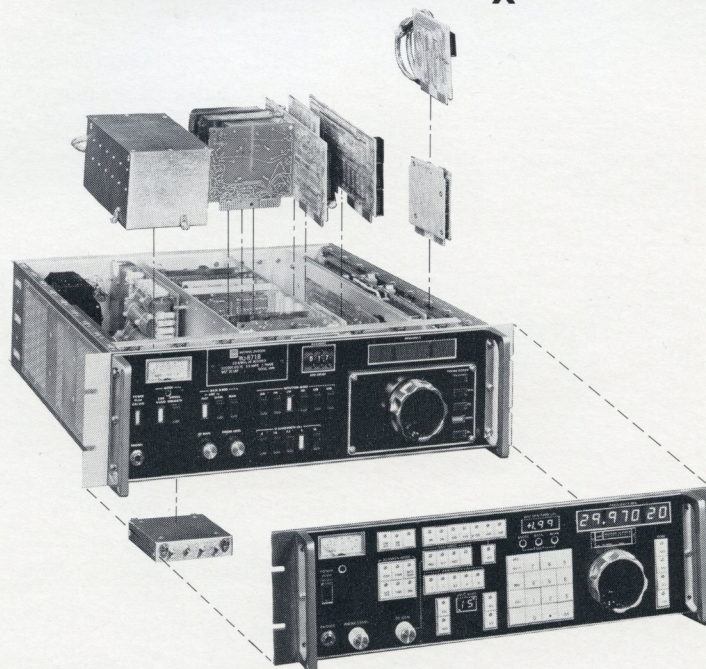




# WJ-8718 HF RECEIVER (AN/URR-74 (V)<sub>x</sub>)

198.10



## FEATURES

- Frequency Coverage from 5 kHz to 30 MHz in One Band
- Fully Synthesized Including BFO
- Five IF Bandwidths Up to 16 kHz
- AM, FM and CW Reception Modes with ISB (USB/LSB) Option
- Over 10 Performance Options and 6 Remote Control Options Available
- Low MTTR; High MTBF
- Modular Construction
- Remote Control Options Such as IEEE 488 and RS-232C/MIL-188C
- Meets MIL-E-16400 and MIL-S-901C Requirements\*
- High Dynamic Range

\*Contact WJ for Details.

## DESCRIPTION

The WJ-8718 General Purpose Receiver is designed to be used in either a manual mode or with remote digital control. Numerous performance and control options provide the exceptional flexibility necessary to conform to almost any

user requirement. Plug-in modular construction throughout allows most options to be field installed after initial delivery should requirements change.

Shown above is the WJ-8718 Receiver in its most popular configuration with the Manual Control Module (MCM) and Independent Sideband (ISB) options. Also pictured are the Preselector (PRE), Signal Monitor Output (SMO), 10 Hz BFO (B10), 1 Hz tuning (1 Hz) and Microprocessor Front Panel (MFP) options.

The front panel allows control of: analog meter functions, AGC decay time, manual gain control, detection mode, B.F.O. Control ( $\pm 8$  kHz) and IF bandwidths. The MCM option provides four tuning speeds and a tuning knob disable.

Sideband detection is accomplished by the Independent Sideband (ISB) option. Either independent, upper or lower detection modes may be front panel selected. When these detection modes are selected, equalized IF sideband filters are automatically switched into a separate detection path from the main signal path and the BFO is automatically set to the proper injection frequency.

Two rear panel terminal boards provide phone, line, FM and ISB audio outputs. (Phone audio is also available at front panel phone jack.) Predetection IF output is provided by a BNC female connector as is the 1 MHz reference output. The 1 MHz reference output is also selectable for an external input.

For Further Information Please Contact:

### WATKINS-JOHNSON COMPANY

700 Quince Orchard Road, Gaithersburg, Maryland 20760  
(301) 948-7550 TWX: 710-828-0546 Telex: 89-8402 Cable: WJCEI

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Specifications subject to change without notice.

**SPECIFICATIONS**

Tuned Frequency . . . . .	5.0 kHz to 29.99999 MHz										
Display . . . . .	7 Digit yellow LED 1/2 inch high (see options list)										
Tuning Speeds . . . . .	Four front panel, pushbutton selected 10 kHz step, 1.2 MHz/turn 1 kHz step, 120 kHz/turn 100 Hz step, 12 kHz/turn 10 Hz step, 1.2 kHz/turn										
Resolution . . . . .	10 Hz (see options list)										
Stability (Internal Reference) . . . . .	6 x 10 <sup>-8</sup> /day, 2 x 10 <sup>-6</sup> /year										
External Reference . . . . .	1 MHz, 50 to 500 MV rms into 50 Ω										
Synthesizer Lock-up Time . . . . .	3 ms typical, 10 ms maximum										
Optional . . . . .	Calculator format, keypad entry of frequency (optional with MFP)										
Detection Modes . . . . .	AM – A3-A4A FM – F1-F2-F3-F4 CW – A0-A1 MCW – A2-A4A Sideband (see options list)										
IF Bandwidths . . . . .	5 standard front panel selected										
Shape Factor (3 dB to 60 dB) . . . . .	3 dB bandwidth minimum										
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 2px;">0.3 kHz</td> <td style="padding: 2px;">1 kHz</td> <td style="padding: 2px;">3.2 kHz</td> <td style="padding: 2px;">6 kHz</td> <td style="padding: 2px;">16 kHz</td> </tr> <tr> <td style="padding: 2px;">7.0:1</td> <td style="padding: 2px;">4.5:1</td> <td style="padding: 2px;">2.5:1</td> <td style="padding: 2px;">2.3:1</td> <td style="padding: 2px;">2.0:1</td> </tr> </table>	0.3 kHz	1 kHz	3.2 kHz	6 kHz	16 kHz	7.0:1	4.5:1	2.5:1	2.3:1	2.0:1
0.3 kHz	1 kHz	3.2 kHz	6 kHz	16 kHz							
7.0:1	4.5:1	2.5:1	2.3:1	2.0:1							
IF Output . . . . .	455 kHz 20 mV minimum into 50Ω for an input signal > 3 μV (see options list)										
Gain Control Mode . . . . .	Manual, AGC fast and slow										
Range . . . . .	100 dB minimum										
AGC threshold . . . . .	3.0 μV 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)										
Optional . . . . .	Keypad entry of frequency offset, 10 Hz resolution										
Sensitivity, 200 kHz - 30 MHz . . . . .	IF BW   Input Signal   (S+N)/N at Audio Out										
CW . . . . .	0.3 kHz   0.40 μV   16 dB										
AM . . . . .	6 kHz   1.7 μV/50% mod. 400 Hz   10 dB										
FM . . . . .	16 kHz   2.5 μV/400 Hz mod.   17 dB 4.8 kHz peak dev.										
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.										
Sideband . . . . .	See options list										
Signal Handling Capabilities											
3rd Order Input Intercept Point . . . . .	+20 dBm, minimum for signals separated by > 30 kHz. (Performance may degrade below 3MHz)										
Reciprocal Mix . . . . .	IF BW 3.2 kHz, desired sig. of 25 μV (-79 dBm) with undesired signal of 79 mV (-9 dBm) Δf from desired >30 kHz, noise ratio (S+N)/N ≥ 20 dB.										
Cross Modulation . . . . .	IF BW 1.0 kHz, desired signal of 10 μV (-87 dBm) with undesired signal 31.6 mV (-17 dBm) Δf 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 $\mu$ V 30% AM signal 600 $\Omega$ unbalanced Line Audio 1W minimum.
Amplifier response .....	$\pm$ 1.5 dB from 100 Hz to 8 kHz, 1 kHz reference frequency
Distortion .....	< 5% at rated output.
Headphone Output .....	30 mW minimum into 600 ohm phones.
FM/CW Output .....	DC coupled low level output from FM/CW detector is provided on the rear panel.
Power Interrupt .....	Programmed and 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 $\Omega$ unbalanced, nominal
Protection .....	Will withstand the effects of RF power up to +30 dBm and static build up. The circuit automatically resets.
Conducted Oscillator Radiation .....	-87 dBm, maximum
Operating Temperature Range .....	0 $^{\circ}$ C to +50 $^{\circ}$ C.
Power Requirements .....	115/220 V AC $\pm$ 15%, 48-410 Hz, 70 watts nominal 90 watts with maximum options installed.
Weight .....	Approximately 35 pounds (15.75 kg)
Size .....	5.25 inches high (13.34 cm)
	19 inches wide (48.26 cm)
	19.4 inches deep (49.28 cm)

Note: All  $\mu$ V measurements referenced to 50 $\Omega$  impedance.

## WJ-8718 OPTIONS

### Nomenclature

### Description

(F) – Field installation kit is available

(C) – Contact factory for installation requirements

WJ-8718/MCM	Manual Tuning Control. Required for local manual control of the mainframe. Not required with MFP option. (F)
WJ-8718/MCM-2	Same as MCM plus remote control of tuned frequency and IF bandwidth. CMOS level compatible. (F)
WJ-8718/ISB	Independent Sideband. Allows separate or simultaneous detection of upper and lower sidebands. Detection Modes: USB/LSB/ISB (A3A-A3H-A3J-A2A-A2H-A2J) ISB line output 100 MN, 600 $\Omega$ balanced. Sensitivity: IF BW      SIGNAL IN      (S+N)/N at audio out 3.2 kHz      .56 $\mu$ V (-112 dBm)      10 dB Filter Characteristics: 2950 Hz at 6 dB points minimum, equalized to 2000 $\mu$ s group delay. Bandpass ripple $\pm$ 1.5 dB maximum. (60dB Bandwidth, 4.7 kHz) (F)
WJ8718/NAV	Special Environment Configuration*
WJ-8718/B10	10 Hz BFO. Provides an additional thumbwheel switch to increase the BFO tuning resolution to 10 Hz. (F)
WJ8718/1 Hz	1 Hz Tuning Resolution. Allows 1 Hz tuning resolution with either manual or remote control options. (C)
WJ-8718/SMO	Signal Monitor Output. An additional rear panel 455 kHz output with 28 kHz BW minimum. (C)
WJ-8718/MFP	Microprocessor Front Panel. Provides manual control of tuned frequency or BFO via keypad or rotary tuning controlled optical encoder; LED indicating pushbutton switches control all other receiver functions. Included are 16 memory channels (expandable to 99) and memory scan capabilities. (C)
WJ-8718/PRE	Preselector. Automatic preselection of 10 suboctave filters, enhances 2nd order intermodulation characteristic. PRE insertion loss modifies sensitivity. (F)
WJ-8718/COR	Carrier Operated Relay. Switched circuitry provided for external use. Threshold is front-panel adjustable and LED indicator displays COR closure. (C)
WJ-8718/RED	Red frequency readout display color. (F)
WJ-8718/GRN	Green frequency readout display color. (F)
WJ-8718/LLA	Low level audio option. Provides 1W nominal audio line output switchable to 1 mW (0 dBm) nominal. Distortion <2% in low level output. ISB line output switchable to 1 mW (0 dBm) nominal if installed.

**WJ-8718 – REMOTE CONTROL OPTIONS**

**Nomenclature**

**Description**

- WJ-8718/232 RS-232-C Bidirectional Asynchronous Communication. Optionally compatible with MIL-STD-188C. Allows master/slave operation via dip switch selection. (F)
- WJ-8718/488-1 IEEE-488/1975 Parallel Interface utilizing the General Purpose Interface Bus (GPIB) defined in IEEE Standard 488-1975. This is a receiver listen only interface. (F)
- WJ-8718/488-2 Same as 488-1 except the interface is bidirectional (Listen/Talk). (F)
- WJ-8718/COM Command Input. Allows remote control of receiver tuned frequency, IF bandwidth, detection and gain modes via 37 parallel input lines. CMOS levels required. Word format and logic are compatible with MON option allowing master/slave operation. (F)
- WJ-8718/MON Monitor Output provides operational information at rear panel. Word format and logic are compatible with COM option allowing master/slave operation. (F)
- WJ-8718/MCM-2 Same as MCM plus remote control of tuned frequency and IF bandwidth. CMOS levels required. (F)
- WJ-8718/232M RS-232-C Remote control option for use with WJ-8718/MFP. (F)
- WJ-8718/488M IEEE-488/1975 Bidirectional Remote control option for use with WJ-8718/MFP. (F)

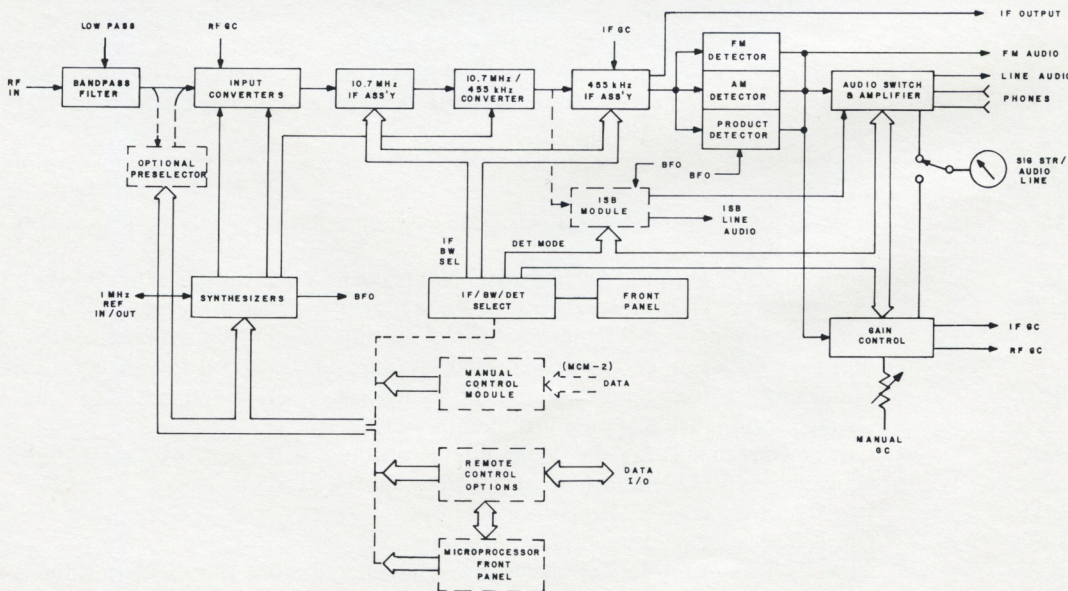
(F) – Field installation kit is available

\*Contact WJ for details.

**CROSS REFERENCE**

CHOSEN OPTION	MCM	MCM-2	232	488-1	488-2	COM	MON	MFP	232M	1 Hz	488M	RED	GRN
MCM	■	E	E	E	E			E	E		E		
MCM-2	I	■						E	E	E	E		
232	E	E	■	E	E	E	E	E	E		E		
488-1	E	R	E	■	E	E	E	E	E	E	E		
488-2	E	E	E	I	■	E	E	E	E	E	E		
COM	E	R	E	E	E	■		E	E	E	E		
MON	E	R	E	E	E		■	E	E	E	E		
MFP	I	I	E	E	E	E	E	■					
232M	E	E	E	E	E	E	E		■		E		
488M	E	E	E	E	E	E	E	E	E		■		
1 Hz		E		E	E	E	E			■	E		
RED												■	E
GRN												E	■

E = CHOSEN OPTION EXCLUDES CROSS REFERENCE OPTION  
 I = CHOSEN OPTION INCLUDES CROSS REFERENCE OPTION  
 R = CHOSEN OPTION REQUIRES CROSS REFERENCE OPTION



WJ-8718 RECEIVER MAINFRAME SIMPLIFIED BLOCK DIAGRAM