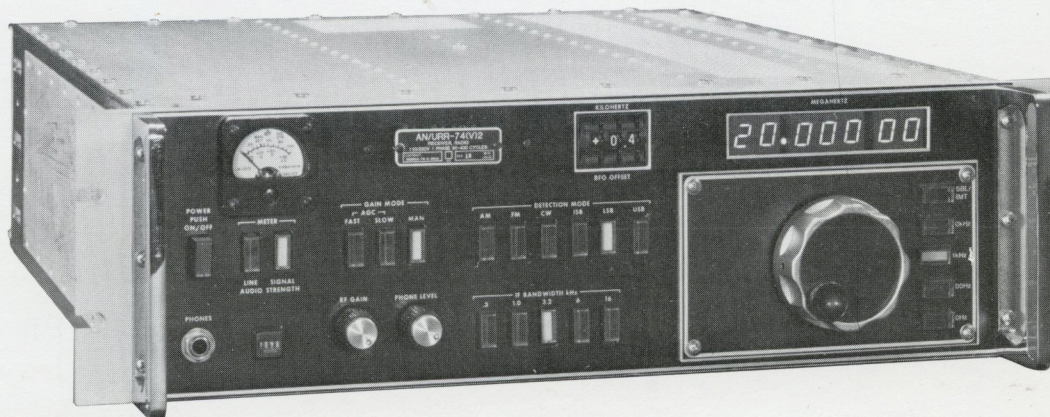


AN/URR-74(V)2 (MULTI-PURPOSE HF RECEIVER)



FEATURES

- Frequency Coverage from 5 kHz to 30 MHz
- Fully Synthesized Including BFO
- Five IF Bandwidths up to 16 kHz
- Demodulates A0, A1, A2, A3, A3A, A3B, A3H, A3J; F1, F2, F3, F4 & F6 signals*
- Low Mean-Time-To-Repair (MTTR)
- High Mean-Time-Between-Failure (MTBF)
- Remote control: MIL-STD-188C/RS-232/IEEE-488
- Modular construction
- High stability internal frequency reference, switch selectable external input
- Meets MIL-E-16400 and MIL-S-901C requirements
- High dynamic range

* See Option List

DESCRIPTION

The AN/URR-74(V)2 Multi-Purpose HF Receiver is designed to be used in either a manual or remote digitally controlled mode. With available options, this highly stable, solid state receiver provides excellent performance in almost any user requirement. Plug-in modular construction allows most options to be field installed should operational requirements change.

The AN/URR-74(V)2 pictured is a standard WJ-8718A Receiver equipped with Manual Control Module (MCM), Independent Sideband (ISB) and Navy Environmental (NAV) options. (The NAV option consists of: MS power connector, 13-pin MS audio connector, conformal coated printed circuit boards, Type "N" RF input connector, double fused AC power circuit, DPST power switch, nickel plated side panels, and MIL-STD elapsed time and RF/Audio meters.)

The front panel allows control of: RF frequency, analog meter functions, AGC decay time, manual gain, detection modes, BFO frequency, IF bandwidths, phone level and power.

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.

Several options are available to enhance the overall capability of the AN/URR-74(V)2 or satisfy specific requirements. Included in these options are: MFP (Microprocessor Front Panel) which allows digital control of all operations plus scanning of desired memory channels and several remote control options which include IEEE-488 and MIL-STD-188C. The aforementioned options come with BIT (Built In Test) which tests: ± 15 V power supplies, first and second LO lock/unlock (the LO lock is monitored continuously during receiver operation), bandwidth selection, BFO lock and offset frequency.

For Further Information Please Contact:

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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)	6×10^{-8} /day, 2×10^{-6} /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 — A2-A3-A4A FM — F1-F2-F3-F4-F6 CW — A0-A1 MCW — A2-A4A USB, LSB, ISB (A3A-A3H-A3J-A2A-A2H-A2J) ISB line output 100 MW, 600 Ω balanced 5 standard front panel selected 3 dB bandwidth minimum															
IF Bandwidths																
Shape Factor (3 dB to 60 dB)	<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;">3.0:1</td> <td style="padding: 2px;">2.6:1</td> <td style="padding: 2px;">2.4:1</td> </tr> </table>	0.3 kHz	1 kHz	3.2 kHz	6 kHz	16 kHz	7.0:1	4.5:1	3.0:1	2.6:1	2.4:1					
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7.0:1	4.5:1	3.0:1	2.6:1	2.4:1												
IF Output	455 kHz 20 mV minimum into 50 Ω for an input signal > 3 μ V (see options list)															
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)															
Optional	Keypad entry of frequency offset, 10 Hz resolution															
Sensitivity, 200 kHz – 30 MHz																
CW	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;"><u>IF BW</u></td> <td style="text-align: center;"><u>Input Signal</u></td> <td style="text-align: center;"><u>(S+N)/N</u> <u>at Audio Out</u></td> </tr> <tr> <td style="text-align: center;">0.3 kHz</td> <td style="text-align: center;">0.40 μV</td> <td style="text-align: center;">16 dB</td> </tr> <tr> <td style="text-align: center;">6 kHz</td> <td style="text-align: center;">1.7 μV/50% mod. 400 Hz</td> <td style="text-align: center;">10 dB</td> </tr> <tr> <td style="text-align: center;">16 kHz</td> <td style="text-align: center;">2.5 μV/400 Hz mod. 4.8 kHz peak dev.</td> <td style="text-align: center;">17 dB</td> </tr> <tr> <td style="text-align: center;">3.2 kHz</td> <td style="text-align: center;">0.56 μV</td> <td style="text-align: center;">10 dB</td> </tr> </table>	<u>IF BW</u>	<u>Input Signal</u>	<u>(S+N)/N</u> <u>at Audio Out</u>	0.3 kHz	0.40 μ V	16 dB	6 kHz	1.7 μ V/50% mod. 400 Hz	10 dB	16 kHz	2.5 μ V/400 Hz mod. 4.8 kHz peak dev.	17 dB	3.2 kHz	0.56 μ V	10 dB
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AM																
FM																
ISB																
	ISB Filter Characteristics: 2950 Hz at 6 dB points minimum, equalized to 2000 μ s group delay. Bandpass ripple ± 1.5 dB maximum. (60 dB Bandwidth, 4.7 kHz) (F)															
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 signal of 25 μ V (-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 μ F (-87 dBm) with undesired signal 31.6 mV (-17 dBm) Δ 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% AM signal 600 Ω unbalanced Line Audio 1 W 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 Ω 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 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	-87 dBm, maximum
Operating Temperature Range	0 $^{\circ}$ C to +50 $^{\circ}$ C.
Power Requirements	115/220 Vac \pm 15%, 48 - 410 Hz, 70 watts nominal 100 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 μ V measurements referenced to 50 Ω impedance.

OPTIONS

Nomenclature

Description

B10	10 Hz BFO. Provides an additional thumbwheel switch to increase the BFO tuning resolution to 10 Hz. (F)
1 Hz	1 Hz Tuning Resolution. Allows 1 Hz tuning resolution with either manual or remote control options. (C)
SMO	Signal Monitor Output. An additional rear panel 455 kHz output with 28 kHz BW minimum. (C)
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 99 memory channels and memory scan capabilities. (C)
PRE	Preselector. Automatic preselection of 10 suboctave filters, enhances 2nd order intermodulation characteristic. PRE insertion loss modifies sensitivity. (F)
COR	Carrier Operated Relay. Switched circuitry provided for external use. Threshold is front-panel adjustable and LED indicator displays COR closure. (C)
FSK	Frequency Shift Keying Demodulator. Provides demodulation of binary FSK signals with shifts of less than 50 Hz to greater than 2000 Hz. Provides for tuning indicators on front panel meter. Bipolar EIA or MIL compatible outputs or monopolar TIL/CMOS. (F)
232	RS-232C Bidirectional Asynchronous Communication. Optionally compatible with MIL-STD-188C. Allows master/slave operation via dip switch selection. (F)
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) (F)
232M	RS-232-C/MIL-STD-188C Remote control option for use with WJ-8718A/MFP. (F)
488M	IEEE-488/1975 Bidirectional Remote control option for use with WJ-8718A/MFP. (F)

(F) - Field installation kit is available

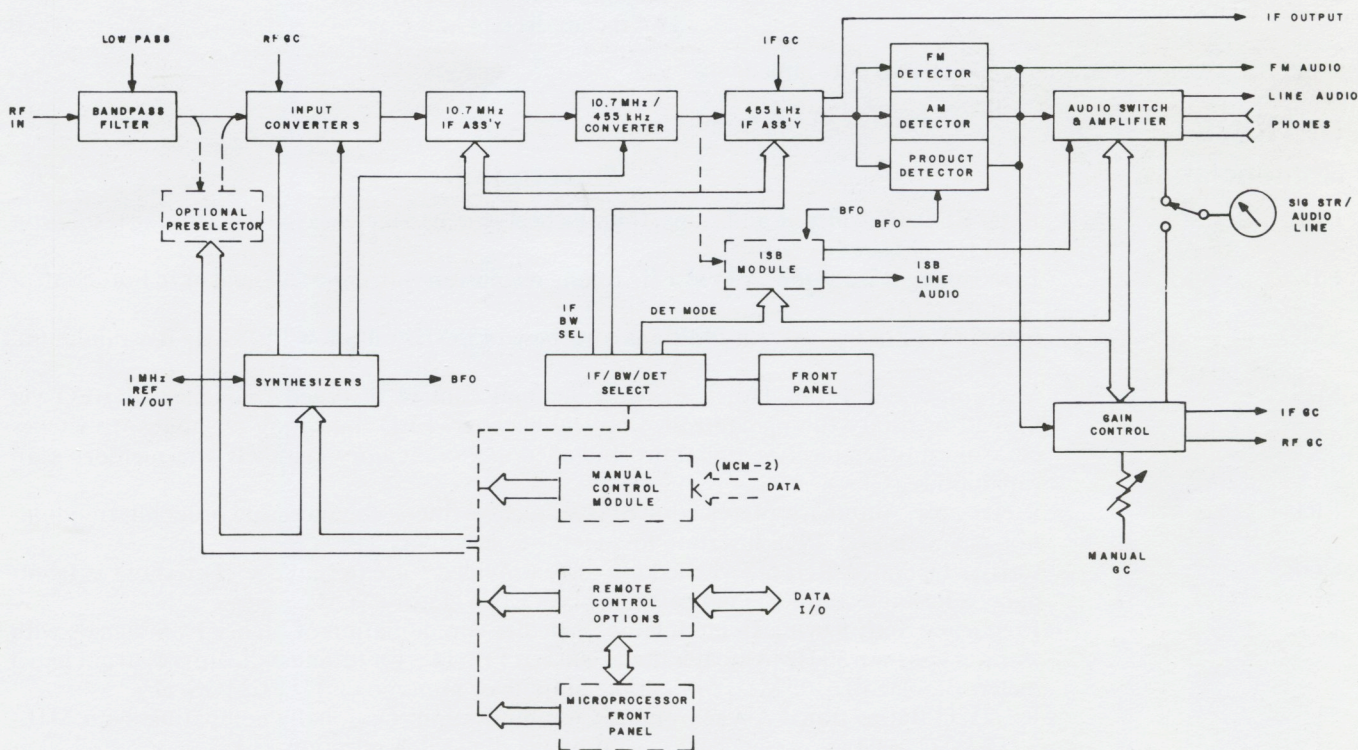
(C) - Contact factory for installation requirements

Contact Watkins-Johnson for details of all options listed.

The AN/URR-74(V)2 HF Receiver was tested according to the requirements of MIL-STD-461A. Test methods CE01, CE02, CE03, CE04, CS01, CS02, CS03, CS04, CS06, RE02, RS03, and RS02 were performed. The AN/URR-74(V)2 met all radiated and conducted emissions requirements and the susceptibility requirements. In addition the AN/URR-74(V)2 has successfully passed the following MIL-E-16400F and MIL-S-901C Environmental Test:

Test MIL-E-16400F	MIL-E-16400F Para. No.	Test Procedure Para. No.	Results
A. Power	4.5.10	3.9	Passed
B. Supply Line Voltage and Frequency	4.5.4	3.9	Passed
C. Heat	4.5.6	3.6	Passed
D. Temperature	4.5.8	3.6	Passed
E. Humidity	4.5.9	3.7	Passed
F. Vibration	4.5.14	3.5	Passed
G. Inclination	4.5.14	3.8	Passed
H. Shock	4.5.14	3.4	Passed
I. Radiated Susceptibility	4.5.11	3.10	Passed

Test MIL-S-901C	MIL-S-901C Para. No. 3.1.3	Test Classification Para. No.3.1.4	Results
A. Shock (Grade "A" or "B") MIL-S-901C Para. 3.1.1.1, 3.1.1.2)	3.1.3.1	3.1.4.1 3.1.4.2 3.1.5.1	Passed Passed Passed



**AN/URR-74(V)2 RECEIVER MAINFRAME
SIMPLIFIED BLOCK DIAGRAM**