TECHNICAL DATA

WATKINS-JOHNSON

198.00

WJ-8736 RECEIVER

FEATURES

The WJ-8736 Receiver is a modern, state-of-the-art receiver intended to replace the RS-111-1B-12( ) Series Receivers. This new receiver incorporates the latest design concepts associated with receiving equipment and employs recently developed semiconductors and solid-state components resulting in a more efficient, highly sensitive, stable receiver. Additionally, the latest techniques for electromagnetic compatibility are included in the receiver design.

The WJ-8736 Receiver is designed for AM, FM, CW, and Pulse Reception over the frequency range of 20 to 1000 MHz. The receiver is contained in a 3.5 inch rack-mount unit.

A complete receiving system including a signal monitor and frequency counter can be easily assembled by adding an EF-201D Equipment Frame into which a type SM-9404A Signal Monitor and DRO-309A Frequency Counter can be installed. The addition of these equipments results in a complete system occupying only seven inches of vertical rack space.

A modular IF concept has been used whereby up to three IF strips may be installed for selection by a front panel switch. IF Bandwidths are available from 10 kHz to 3 MHz. Optional IF Bandwidths of 4 kHz and 4 MHz are available on special order. When the 20-90 MHz band is in use, the maximum IF Bandwidth available is 1 MHz up to 40 MHz, and 1.5 MHz above 40 MHz.

The receiver is provided with a carrier operated relay (COR) and an audio squelch circuit. A common threshold control for these circuits is available on the front panel. The WJ-8736 Receiver has the option of conventional AFC, DAFC, or open-loop operation as selected by a front-panel switch. DAFC operation requires a compatible WJ frequency counter, such as the DRO-333 or DRO-309A to be interfaced with the receiver. When so configured, the receiver can be locked to any frequency within the 20-1000 MHz range. The receiver is provided with an automatic frequency counter range and preset switching feature. This feature allows the counter's range and preset circuitry to be automatically changed when the tuner select switch is exercised.

IF modules for the WJ-8736 Receiver are designated as follows:

Type	IF Bandwidth
WJ-9930-10	10 kHz
WJ-9930-20	20 kHz
WJ-9930-50	50 kHz
WJ-9930-100	100 kHz
WJ-9930-200	200 kHz
WJ-9930-300	300 kHz
WJ-9930-500	500 kHz
WJ-9930-1M	1 MHz
WJ-9930-2M	2 MHz
WJ-9930-3M	3 MHz

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Printed in U.S.A.

AUGUST 1975

Specifications subject to change without notice.

SPECIFICATIONS

Tuning Range	20-1000 MHz
Band A	20-90 MHz
Band B	90-300 MHz
Band C	250-500 MHz
Band D	500-1000 MHz
Input Impedance	50 ohms, nominal
Input VSWR:	
Band A	4:1, maximum
Band B	3:1, maximum
Band C and D	2.5:1, maximum
Noise Figure:	
Band A	6 dB, maximum
Band B	8 dB, maximum
Band C	10 dB, maximum
Band D	12 dB, maximum
3rd Order Intermod Intercept Point	−10 dBm, typical, referred to input (in band)
Image Rejection	60 dB, minimum
IF Rejection	
Band A	60 dB, minimum
Band B, C, and D	80 dB, minimum
LO to Antenna Conduction	4 μV, maximum
Frequency Stability (LO drift at constant temperature after initial one-hour warm-up):	
Band A	10 kHz per hour, maximum
Band B	20 kHz per hour, maximum
Band C	30 kHz per hour, maximum
Band D	60 kHz per hour, maximum
Overall Bandwidth:	
Band A	1 MHz, minimum, below 40 MHz; 1.5 MHz minimum, above 40 MHz
Band B, C, and D	3 MHz, minimum
Tape Dial Accuracy	±1%.
Fine tuning Range	±0.05%
Local Oscillator Output	50 mV, minimum, 50-ohm load impedance
Antenna Inputs (two):	
VHF (20-500 MHz)	Bands A, B, and C
UHF (500-1000 MHz)	Band D
IF Frequency	21.4 MHz, Final IF
Types of Demodulation	AM, FM, CW, and Pulse
IF Bandwidths	Up to three front-panel selectable IF bandwidths are provided. The customer may select bandwidths between 10 kHz and 3 MHz as shown above.
Signal Monitor Output	21.4 MHz center frequency; 3 MHz flat response
Intermediate Frequency	21.4 MHz
Predetection IF Output	21.4 MHz center frequency; provides 100 mV, minimum, into 50-ohm load for input signals above AGC threshold.
BFO Circuit	Operates in all IF bandwidths. Crystal controlled, zero beat oscillator.
COR Sensitivity	6 dB below input signal levels specified for 10 dB (s plus n)/n for each tuner and IF bandwidth.
COR Range	Continuously adjustable to operate on minimum threshold input signals and up to −40 dBm input.
COR Operate Time	5 ms, maximum
COR Release Time	6 sec, ±25%
AM Output Stability with AGC	Output changes by no more than 6 dB from input signal levels specified for 10 dB (s plus n)/n for each tuner and IF bandwidth to −10 dBm

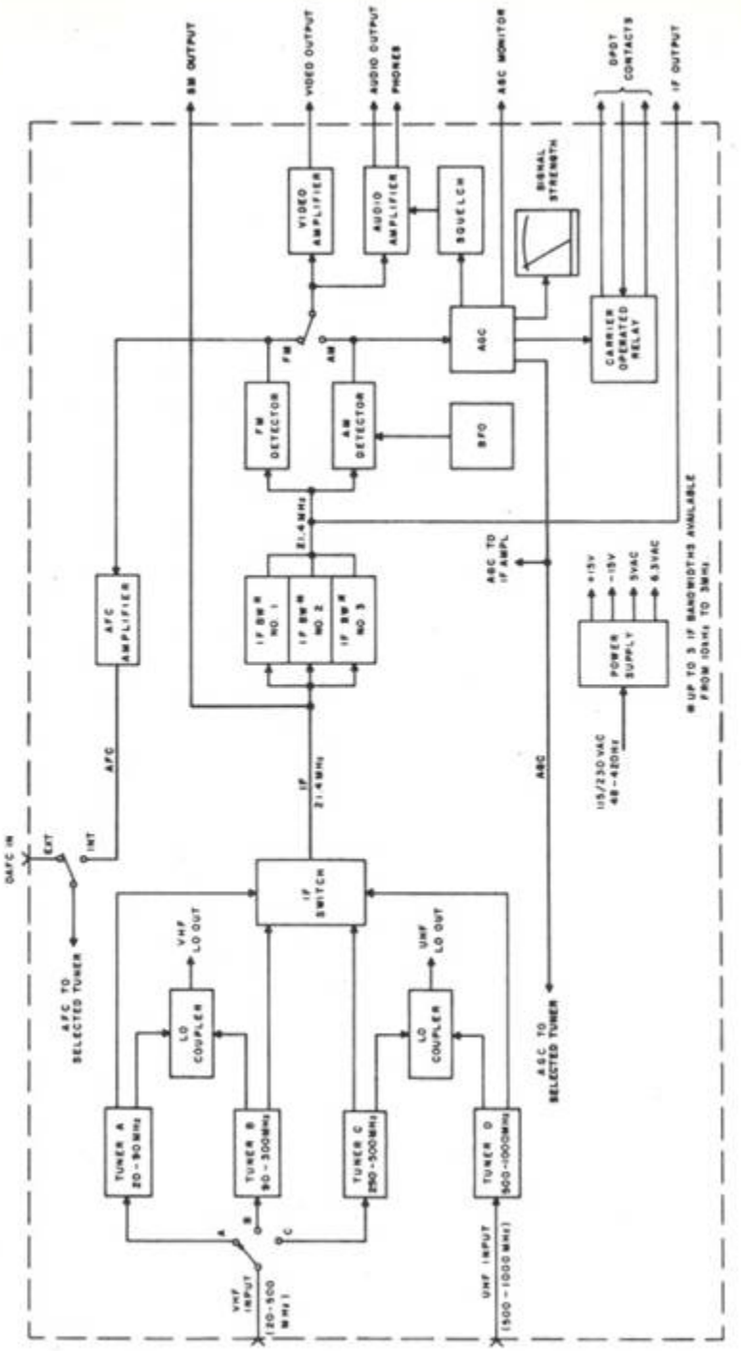
Sensitivity	See Sensitivity Table
Tangential Sensitivity	Input signal levels 6 dB lower than those in the table will produce tangential sensitivity for pulse signals with a repetition rate equal to .01 of the IF bandwidth and a 10% duty cycle.
Gain Control Characteristics:	
Pulse AGC, 3-MHz Bandwidth	Charge time sufficiently short to permit pulse widths as narrow as 1 μsec and as wide as a square wave. Discharge time sufficiently long to operate with PRR of 100 pps.
Manual Control Range	70 dB, minimum
Video Output Power	1 V RMS into 100 ohm load
Video Amplifier Response	Within 3 dB from 20 Hz to 2 MHz
Audio Output Power	100 mW, minimum into 600-ohm load floating at phone jack or at rear-panel multipin connector.
Audio Frequency Response	Within 3 dB from 100 Hz to 20 kHz
Meters	Signal Strength and Tuning
Operating Temperature	0^{o} C to 50^{o} C
Input Power	115/220 Vac, ±10%, 48-420 Hz
Power Consumption	35 watts, approximately
Dimensions	3.5 inches high, 19 inches wide, 19.5 inches deep
Weight	35 lbs., approximately

SENSITIVITY TABLE

Receiver AM,* FM* Sensitivity in dBm At Available IF Bandwidths									
Frequency Range	10 kHz	20 kHz	50 kHz	100 kHz	200 kHz	300 kHz	500 kHz	1 MHz	3 MHz
20-90 MHz	−109	−106	−102	−99	−96	−94	−92	−89	−84
90-300 MHz	−107	−104	−100	−97	−94	−92	−90	−87	−82
250-500 MHz	−105	−102	−98	−95	−92	−90	−88	−85	−80
500-1000 MHz	−103	−100	−96	−93	−90	−88	−86	−83	−78

*AM The input signal level in dBm, AM modulated 50% by a 1 kHz tone, will produce 10 dB (s plus n)/n minimum when used with a tuner having a noise figure as specified in the Table.

*FM The input signal levels in dBm, FM modulated at a 1 kHz rate with a deviation equal to 30% of the IF bandwidth, will produce 17 dB (s plus n)/n minimum when used with a tuner having a noise figure as specified in the Table. For the 4 and 10 kHz IF bandwidths, the FM is modulated at a 400 Hz rate.



WJ-8736 RECEIVER SIMPLIFIED BLOCK DIAGRAM