

# Technical Data Sheet

## Microwave Products Division



WATKINS-JOHNSON

## Microwave Receiver WJ-8969C



### DESCRIPTION

The WJ-8969C is a Microwave Receiver designed for receiving applications in the 0.5 to 18 GHz tuned frequency, with emphasis on small size, low phase noise and high NPR. The receiver is a single complete unit with the tuner, demodulator, and controller functions combined. A 70 MHz IF with 40 MHz minimum IF bandwidth is utilized for all receiving functions with up to six selectable IF filters included.

High resolution tuning, in 1 kHz synthesized steps, is implemented with very good phase noise performance. This performance, combined with the SAW filters used for IF filtering, provides superior results in digital and analog signal reception applications.

### FEATURES

- *0.5 to 18 GHz frequency range*
- *Frequency synthesized tuning in 1 kHz steps*
- *Wideband 70 MHz IF output*
- *Excellent phase noise and NPR*
- *AM, FM, and pulse detection modes*
- *Low group delay using SAW filters*
- *IEEE-488 control*

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## WJ-8969C

The WJ-8969C front panel provides all system controls for operations including manual tuning, memory scan, step and lockout programming and implementation, gain control, IF bandwidth selection, AGC and AFC functions, and demodulation mode control. The receiver implements built-in test which monitors system performance and automatically indicates hardware problems during operation. The IF filters, ranging from 250 kHz to 40 MHz, are customer installable and the

receiver automatically identifies installed filter values upon power-up. The WJ-8969C is a 3-1/2 inch high, standard 19-inch rack mountable chassis with all connections provided on the rear panel and all operator controls on the front panel. An IEEE-488 remote interface is included for computer control or status connections. Peripheral units such as IF Pan displays, digitally refreshed displays, and standard analysis equipment can easily be interfaced to the WJ-8969C.

### WJ-8969C SPECIFICATIONS

Input Frequency Range	0.5 to 18 GHz		
Frequency Resolution	1 kHz, Synthesized		
Frequency Accuracy (over temperature)	3 x 10 <sup>-7</sup> after 10-Minute Warm-Up 1 x 10 <sup>-7</sup> , Typical		
LO Radiation	-90 dBm, Maximum <-100 dBm, Typical		
Noise Figure	15 dB, Maximum 13 dB, Typical		
Input VSWR	2.5:1, Maximum		
Image Rejection	70 dB, Minimum		
RF to IF Gain	11 dB, Minimum (at WB Sig. Mon. Output)		
1 dB Compression Dynamic Range	85 dB, Minimum (1 MHz BW)		
Phase Jitter	1.5°, Maximum, Integrated from 100 Hz to 40 MHz		
SSB Phase Noise			
		dBc/Hz	dBc/Hz
	<u>Offset</u>	<u>(maximum)</u>	<u>(typical)</u>
	1 kHz	-73	-85
	10 kHz	-83	-95
	-93	-110	
	-120	-123	
Gain Control	Manual and AGC, 80 dB Range in 1 dB Steps		
IF Bandwidths	6 Selectable, Maximum. See Table 1.		
IF Outputs	Signal Monitor: 70 MHz, 40 MHz BW Filtered IF: 70 MHz, Bandwidth Selection Dependent; -25 dBm Nominal (AGC)		
Noise Power Ratio	40 dB, Nominal		

**WJ-8969C SPECIFICATIONS (Continued)**

Demodulation	AM, FM, Pulse
Video Outputs	AM: 0.1 to 1.2 Vp-p, Adjustable; DC-Coupled FM: 0.1 to 1.2 Vp-p, Adjustable; AC-Coupled
Video Impedance	50Ω, Nominal
Video Response	DC to 1/2 Selected IF Bandwidth
Audio Output	Selected Audio, 0V to 1.0V, Minimum; DC-Coupled
Connectors	
Inputs	RF Input, SMA Female AC Power IEEE-488
Outputs	Pan IF, BNC Female Selected IF, BNC Female AM Video, BNC Female FM Video, BNC Female Selected Audio, BNC Female DRD Serial Interface, Twin-Ax Female
Digital Control	IEEE-488
Physical Size (H x W x D)	3.5 x 19 x 20 inches, not including handles, connectors, controls etc.
Temperature Range	
Operating	0°C to +50°C
Nonoperating	-20°C to +80°C
Power	115, 230 Vac ±15% 47 to 400 Hz Single Phase 140W
EMI	MIL-STD-461B, CE03, and RE02 <sup>1</sup>
Weight	50 Pounds, Maximum

<sup>1</sup>The WJ-8969C has been designed to meet the applicable requirements of MIL-STD-461B.

Table 1. Available IF Bandwidth Filter Values (3 dB BW, 70 MHz Center)

250 kHz	6.5 MHz	18 MHz
500 kHz	7.0 MHz	20 MHz
750 kHz	7.5 MHz	22 MHz
1.0 MHz	8.0 MHz	24 MHz
1.5 MHz	8.5 MHz	26 MHz
2.0 MHz	9.0 MHz	28 MHz
2.5 MHz	9.5 MHz	30 MHz
3.0 MHz	10.0 MHz	32 MHz
3.5 MHz	11.0 MHz	34 MHz
4.0 MHz	12.0 MHz	36 MHz
4.5 MHz	13.0 MHz	38 MHz
5.0 MHz	14.0 MHz	40 MHz
5.5 MHz	15.0 MHz	
6.0 MHz	16.0 MHz	