

955.00

WJ-9477(G) PRECISION TUNABLE DEMODULATOR



STANDARD FEATURES

- 0 Hz to 31 MHz Tuning Range
- AM and FM Demodulation
- 1 Hz Tuning Resolution
- AGC or Manual Gain Control
- IEEE-488 Bus Compatible

OPTIONAL FEATURES

- Nine Selectable IF Bandwidths
- Single Sideband Demodulation (SSB)
- Independent Sideband Demodulation (ISB)
- IF Down Converter (IFC)
- Video Filtering (VF)
- Video Output Attenuator (VOA)

*NOTE: In January 1989, the front and rear panels of the WJ-9477 were redesigned to accommodate all selectable options. The function and circuitry are identical to previous WJ-9477 units except for the addition of 1 Hz tuning and the options. In order to distinguish between the old and new models, the redesigned WJ-9477 is labeled WJ-9477(G). Options will be indicated on the rear panel.

DESCRIPTION

The WJ-9477(G) Tunable Demodulator provides AM, FM, and optional SSB and ISB demodulation of received signals from 0 Hz to 31 MHz. The use of frequency synthesized local oscillators provides accurate tuning with a resolution of 1 Hz. The demodulator operates with input signal levels between -65 dBm and -15 dBm. Gain control is provided by AGC or manual gain modes, each having a range of 50 dB. Utilization of microprocessor-based digital control circuitry permits the flexibility of local or remote control. Local control allows complete operation of the demodulator via the front panel controls. These controls consist of audio level and signal level control knobs, tuning wheel, and a thirty-button keypad. Use of the LED indicators and two seven-segment LED displays provide a visual indication of the demodulator operating parameters. Two analog meters indicate signal strength and center tuning. Remote operation, via the standard IEEE-488 interface, allows front panel control functions to be selected by an external controller. The controller can also be utilized to obtain the complete operating status of the demodulator.

The WJ-9477(G) is designed to accommodate optional features that offer a wide variety of system configurations. The available options are listed below, followed by a functional description:

- **IF Bandwidth** — Up to nine bandwidths can be selected (ranging from 3.2 kHz to 6 MHz) from three different filter groups. Group 1 (GR1) standard filters exhibit good

signal processing quality and performance. Group 2 (GR2) precision filters are for exceptionally steep adjacent channel rejection. Group 3 (GR3) linear phase filters are optimized for good transient behavior, thus introducing minimal distortion to most forms of modulation such as AM, FM, or Pulsed RF. (See Table 1 for additional information on IF bandwidth specifications.)

- **WJ-9477/IFC, IF Converter** — Down converts the 21.4 MHz IF output to a center frequency ranging between 10 kHz and 3 MHz, programmable in 5-kHz steps. Also allows for an external LO to be used in place of the internal local oscillators.
- **WJ-9477/ISB, Independent Sideband** — Provides simultaneous USB and LSB outputs in addition to a selected USB or LSB output. (ISB option includes SSB option.)
- **WJ-9477/SSB, Single Sideband** — Permits selectable upper sideband (USB) or lower sideband (LSB) demodulation of the received signal.
- **WJ-9477/VF, Video Filter** — Provides up to nine selected video filters optimally matched to one-half of the IF bandwidth.
- **WJ-9477/VOA, Video Output Attenuator** — Built-in video output attenuator variable from 0 to 31 dB in 1 dB steps.

SPECIFICATIONS

Frequency Range	0 kHz to 31 MHz
Input Impedance	50 ohms nominal
Detection Modes	AM, FM (SSB or ISB optional)
Final IF	21.4 MHz
IF Rejection	80 dB minimum
Image Rejection	80 dB minimum
Conducted LO	-100 dBm maximum at RF Input
Noise Figure	18 dB maximum
Ultimate Signal to Noise Ratio	50 dB minimum in SSB 44 dB minimum in FM 45 dB minimum in AM
Harmonic Distortion FM	3% THD maximum when deviated 30% of BW
Bandpass Ripple	1.5 dB maximum
IF Bandwidths	Nine selectable IF bandwidths can be installed. For choice of bandwidth and filter see Table 1
Bandwidth Shape Factor	See Table 1
Bandwidth for optional SSB, ISB (-3 dB)	300 to 3500 Hz minimum
Inputs	
RF	-65 to -15 dBm
External Reference	1.0 MHz, 0 dBm nominal

Outputs	
AM Video	DC coupled 1 V nominal into 75 ohms (50 ohms optional), 50% AM modulated signal
FM Video	DC coupled ± 1 V nominal into 75 ohms (50 ohms optional), peak deviation equals 30% of IF bandwidth
ISB (Optional LSB and USB Outputs)	0 dBm nominal into 600 ohms
Selected Video (With Optional Video Attenuation)	AC coupled 0 to 31 dB attenuation, 0 dBm nominal
Filtered IF Output	- 20 dBm nominal
IF Signal Monitor	20 dB nominal above input level at maximum gain
Optional IF Converter Output Level	- 10 dBm nominal
Center Frequency Range, Translated IF	10 kHz to 3 MHz, in 5 kHz increments
Image and Spurious Response Rejection, Translated IF	50 dB minimum (depending on selected IF filter)
Internal Reference Oscillator Accuracy	1 part in 10^7
Tuning Resolution	1 Hz to 100 kHz selectable in decades
Gain Control	Manual or AGC
Manual Gain Control Range	50 dB nominal
Video Attenuation (Optional)	31 dB in 1 dB steps
Operating Temperature Range	10° to 30°C
Power Requirements	115/230 VAC $\pm 10\%$, 50 to 400 Hz
Power Consumption	60 watts, typical
Size	19.0 inches wide, 23.5 inches deep overall, 5.22 inches high
Weight	40 pounds (18 kgs) approximate

TABLE 1

Bandwidth Filter Selection

Model Number*	3 dB Bandwidth (kHz)	Linear Phase**		
		Standard (3:60 dB) GR1	Precision (3:50 dB) GR2	(Linearity) GR3
WJ-9477/3.2K-*	3.2	3:1	2:1	—
WJ-9477/4K-*	4	3:1	2:1	—
WJ-9477/10K-*	10	3:1	2:1	$\pm 6^\circ$
WJ-9477/15K-*	15	3:1	2:1	$\pm 6^\circ$
WJ-9477/20K-*	20	3:1	2:1	$\pm 6^\circ$
WJ-9477/25K-*	25	3:1	2:1	$\pm 6^\circ$
WJ-9477/30K-*	30	3:1	2:1	$\pm 6^\circ$
WJ-9477/50K-*	50	3:1	2:1	$\pm 6^\circ$
WJ-9477/75K-*	75	3:1	2:1	$\pm 6^\circ$
WJ-9477/100K-*	100	3:1	2:1	$\pm 6^\circ$
WJ-9477/150K-*	150	3:1	2:1	$\pm 6^\circ$
WJ-9477/200K-*	200	3:1	2:1	$\pm 6^\circ$
WJ-9477/250K-*	250	3:1	2:1	$\pm 6^\circ$
WJ-9477/300K-*	300	4:1	2:1	$\pm 6^\circ$
WJ-9477/500K-*	500	4:1	2:1	$\pm 6^\circ$
WJ-9477/750K-*	750	4:1	2:1	$\pm 6^\circ$
WJ-9477/1M-*	1000	4:1	2:1	$\pm 6^\circ$
WJ-9477/1.5M-*	1500	4:1	2:1	$\pm 10^\circ$
WJ-9477/2M-*	2000	4:1	2:1	$\pm 10^\circ$
WJ-9477/2.5M-*	2500	4:1	2:1	$\pm 18^\circ$
WJ-9477/5M-*	5000	4:1	2:1	$\pm 18^\circ$
WJ-9477/6M-*	6000	4:1	2:1	$\pm 18^\circ$

*When ordering, add GR1, GR2, or GR3, as appropriate, following model number to specify group selection.

**Shape factor is 5:1 for GR3 filters, -3 dB to -40 dB bandwidth ratio.