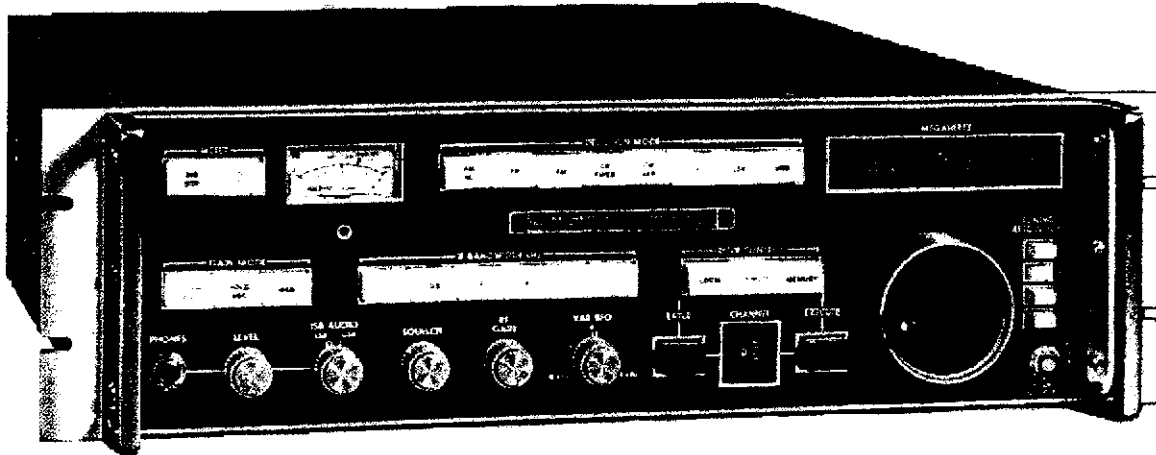




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WJ-8888B HF RECEIVER



FEATURES

The WJ-8888B is a highly versatile HF receiver which provides exceptional signal handling capabilities over the frequency range of 500 kHz to 30 MHz. The receiver has three operating modes: Local, Remote and Memory. In the Local mode, the receiver is tuned manually by the operator. In the Remote mode, the receiver accepts and stores a digital word which controls the tuned frequency, detection mode, gain mode, IF bandwidth, RF gain level, and BFO frequency. In conjunction with the Local mode, the Memory mode enables the operator to store up to sixteen sets of receiver frequencies and control parameters, which may be recalled as required.

The receiver is designed for the reception of AM, FM, CW, ISB, LSB and USB emissions. Up to six IF bandwidths may be selected via front panel pushbutton switches. Four standard IF bandwidths of 0.5-, 2-, 4-, and 8-kHz are supplied with two IF bandwidths reserved for customer selection. The optional IF bandwidths are 0.2-, 1-, 3-, 6-, 12-, or 16-kHz. Each IF bandwidth filter is mounted on an individual plug-in card for simplified maintenance and changeover.

The WJ-8888B is supplied with four switch-selectable tuning speeds with resolutions of 10 Hz, 100 Hz, 1 kHz and 10 kHz. Other standard features include automatic switching of sub-octave preselection filters to minimize intermodulation distortion and synthesized local oscillators for maximum receiver stability.

The tuned frequency of the receiver is displayed on a front-panel seven-digit LED readout. Resolution of the

display is 10 Hz over the entire tuning range. Three selectable gain control modes are provided: Manual, Normal AGC and Hold AGC. A meter on the front panel indicates relative signal strength or calibrated line audio output level. Front panel controls include: Main Tuning, RCVR Control, IF Bandwidth Select, Gain Mode Select, Detection Mode Select, RF Gain, ISB Audio Select, Audio Level, Squelch, Variable BFO Control and the four tuning resolution switches.

Variable audio output is available at a front-panel phone jack and balanced LSB, USB and Line Audio Outputs as well as the variable audio are available at a rear panel connector. An audio squelch circuit mutes the receiver audio output in the absence of incoming signals below the threshold set by the front panel Squelch Control. The receiver also provides a predetection IF output and a Signal Monitor output with a center frequency of 455 kHz. The 64-bit TTL-compatible I/O data is interfaced to the unit via connectors on the rear panel.

To enhance the receiver's versatility, a number of options are available in addition to the customer selected bandwidth options. The receiver may be ordered without the preselector sub-octave filters when the receiver is used in a low density environment or when preselection is accomplished by the associated antenna network. An optional logarithmic IF amplifier also is available.

The standard I/O interface module accepts the 64-bit serial synchronous data word. As a customer-selected option, transmission of the 64-bit data word can be serial

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SEPTEMBER 1977

Supersedes Technical Data Sheet 198.5 dated April 1976

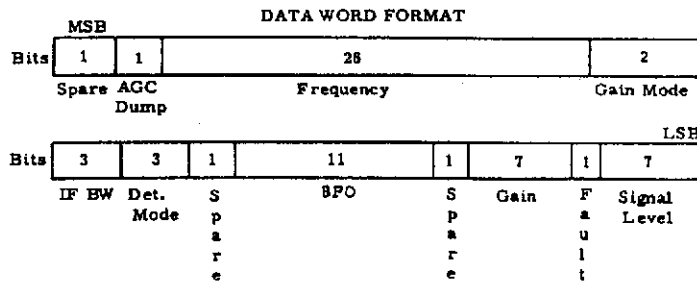
Specifications subject to change without notice.

asynchronous. In systems where master/slave or remote operation of receiver groups is desired, the remote/slave receivers can be supplied without front panel controls and frequency readout. The master/slave control is inherent in the optional serial asynchronous I/O module.

The WJ-8888B is designed for mounting in a standard 19-inch equipment rack and occupies 5.25 inches of vertical space. The standard unit operates on 115/220 Vac $\pm 10\%$, 48-62 Hz; 400 Hz operation is available as an option.

SPECIFICATIONS

Tuning Range	0.5 - 30 MHz
Tuning Resolution	10 Hz, 100 Hz, 1 kHz, 10 kHz; switch-selectable
Preselection	Sub-octave filters automatically switched
Input Impedance	50 ohms, unbalanced
Oscillator Radiation	10 μ V or less at receiver input
Antenna Input Protection	The antenna input will withstand the effects of RF power to +15 dBm and static build-up. The protection circuit automatically resets.
IF Bandwidths (3 dB)	4 Bandwidths supplied, 6 positions available
Normally Supplied	0.5-, 2-, 4-, and 8-kHz
Optional	0.2-, 1-, 3-, 6-, 12-, or 16-kHz
IF Shape Factor (Typical)	IF BW 50 dB:3 dB
	0.2 kHz 10:1
	0.5 kHz 7:1
	1 kHz 5:1
	2 kHz 3:1
	16 kHz 1.9:1
	Filters with higher selectivity may be special ordered.
Detection Modes	AM Noise Limiter, AM, CW Fixed, CW Variable, USB, LSB, ISB, FM
Gain Control Modes	Manual, Normal AGC, Hold AGC
AGC and Manual Range	100 dB, minimum, for input signals above 2 μ V
AGC Threshold	2.0 μ V, minimum
AGC Attack Time	20 ms, nominal
AGC Release Time	Normal AGC, 0.1 seconds. Hold AGC, 2 seconds; both nominal.
Internally Generated Spurious	1 μ V, maximum (equivalent input signal)
Tuning Speed (Remote)	5 ms, typical; 15 ms, maximum
Frequency Stability	6×10^{-8} per day, 2×10^{-6} per year
Standard Frequency Output	50 mV, minimum at 1 MHz into 50 ohms. Provision is made for an external 1 MHz standard.
Frequency Display	7 Digit, LED (dot matrix) display
Remote Control	Via Input/Output TTL serial synchronous differential pair, 64-bit word; formats as shown below:



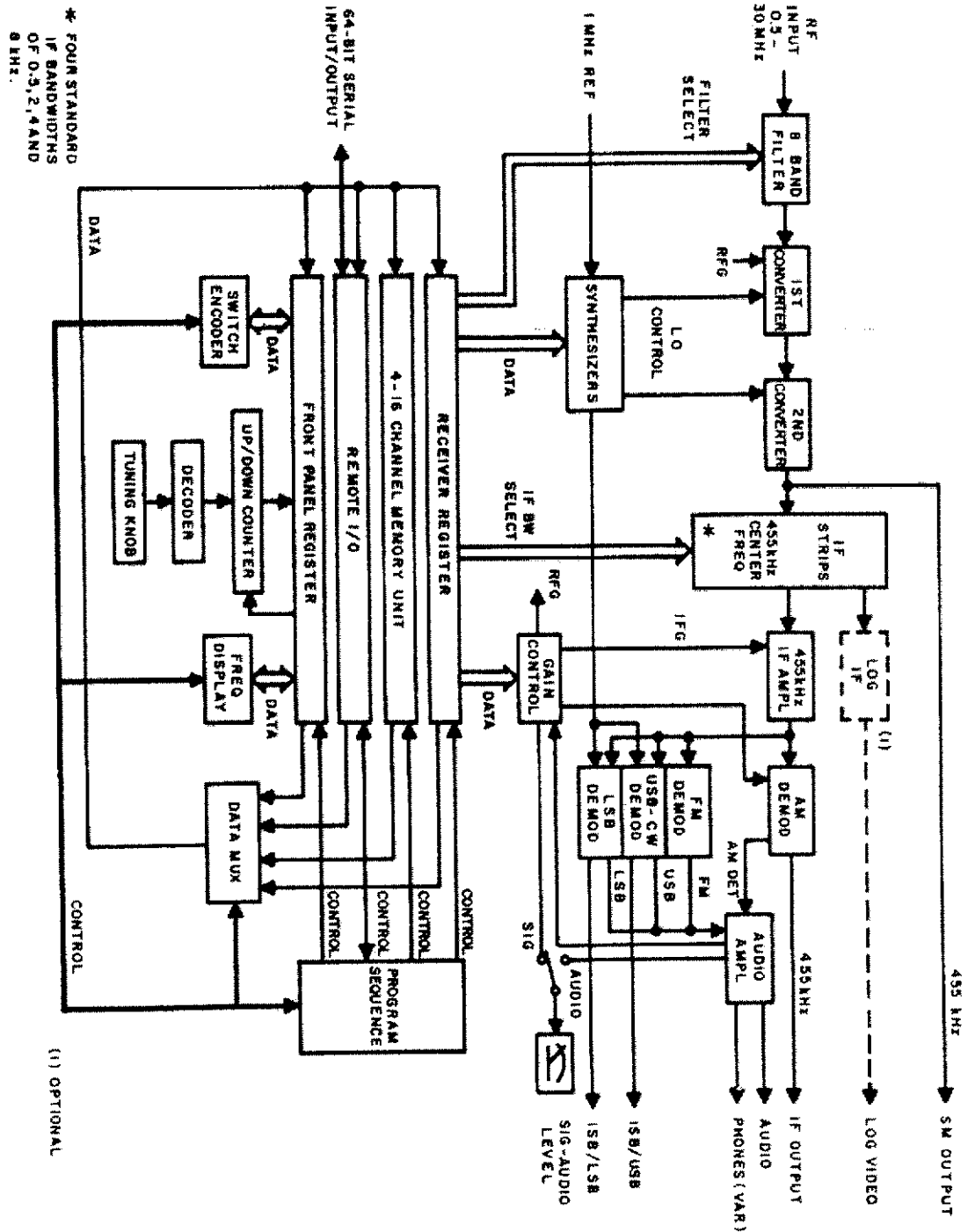
Remote Control Interface:	
Input Trigger	Differential pair, TTL strobe pulse, positive logic, 5 ms minimum pulse width; from controlling device to command receiver to supply clock signal for synchronous transfer of data.
Clock Input/Output	Two differential pairs, TTL clock train, 25 kHz, 10% duty cycle, square wave; effects serial data transfer to/from controller; may be OR wired.
Receiver Address	One differential pair, discrete, TTL level Logic 1 = receiver addressed Logic 0 = receiver not addressed

Memory Mode	Four channel memory capacity supplied. The entire 64-bit word is stored. Complete operating mode of the receiver may be internally stored and recalled later.
Optional Memory	Up to a total of sixteen channels in groups of four channels.
AC Power Interrupt	While the receiver is in the Local Mode, all the above functions are placed in a separate memory and reappear when power returns.
Control Modes	Local, Memory and Remote
Sensitivity:	
AM Sensitivity	The input signal levels specified in Table 1, 50% AM modulated at a 400-Hz rate will produce a 10 dB (S+N)/N ratio at the audio output (1 kHz and greater IF bandwidths).
CW Sensitivity	The CW input signal levels specified in Table 1, will produce a 16 dB (S+N)/N ratio at the audio output.
FM Sensitivity	The input signal levels specified in Table 1, FM modulated at a deviation equal to 30% of the IF bandwidth at a 400 Hz rate, will produce a 17 dB (S+N)/N ratio at the audio output (6 kHz and greater IF bandwidths).
LSB, USB, ISB	0.56 μ V for 10 dB (S+N)/N or greater in 2.8 kHz bandwidth (8 kHz IF bandwidth also in use).
Audio Outputs:	
Line Audio	1 mW, minimum, transformer coupled, balanced into 600 ohms at 2.0 μ V input level or greater.
Audio Distortion	Less than 5%
Audio Amplifier Frequency Response	Within 3 dB from 100 Hz to 15 kHz
Phones	10 mW, minimum into 600 ohms; front panel adjusted
ISB (LSB, USB)	Two, each provides 1 mW, minimum, transformer coupled, balanced, into 600 ohms at 0.56 μ V input level
IF Output	455 kHz, 50 mV, minimum, at 2 μ V input level or greater
Signal Monitor Output	455 kHz center frequency, bandwidth limited by first IF filter
IF Rejection	Greater than 100 dB
Image Rejection	Greater than 100 dB
Unwanted Sideband Rejection	50 dB at 350 Hz into unwanted sideband
Intermodulation:	
Third Order Input Intercept Point	+20 dBm, minimum, for the undesired signals separated by more than 50 kHz
Second Order Input Intercept Point	+60 dBm, minimum
Reciprocal Mixing	With a desired signal of 25 microvolts, in the 2 kHz IF bandwidth, the desired signal to noise ratio will be greater than 20 dB, when an undesired signal 70 dB higher in amplitude and removed 30 kHz in frequency is present.
Cross Modulation	With desired signal at 50 μ V, an undesired signal at 50 mV greater than 50 kHz away, AM modulated 50% produces an output at least 20 dB below the output level of desired signal in the 2 kHz IF bandwidth.
Non-Remote Control Functions	Phone level, squelch, memory channel select and RF/Audio Meter
Signal Meter	Indicates RF input signal level or line audio output level
Size	19 inches wide, 5.25 inches high, and 19.5 inches deep
Weight	Approximately 40 pounds
Operating Temperature Range*	0°C to 50°C
Power Consumption	Approximately 0.8 amps at 115 Vac
Input Power Requirements	115/220 Vac \pm 10%, 48-62 Hz

*Operation within published specifications guaranteed at 25°C \pm 5°C.

TABLE 1. SENSITIVITY

IF Bandwidth kHz	Input Level		IF Bandwidth kHz	Input Level	
	Microvolts	dBm		Microvolts	dBm
0.2	0.40	-115.5	4.0	1.3	-105
0.5	0.45	-114	6.0	1.7	-102.5
1.0	0.64	-111	8.0	1.8	-102
2.0	0.89	-108	12.0	2.4	-99.5
3.0	1.2	-105.5	16.0	2.5	-99



* FOUR STANDARD
IF BANDWIDTHS
OF 0.5, 2, 4 AND
8 KHZ.

(1) OPTIONAL

WJ-8888B RECEIVER - SIMPLIFIED BLOCK DIAGRAM

INSTRUCTION MANUAL
FOR
TYPE WJ-8888-5 HF RECEIVER

The accompanying manual covers the basic WJ-8888 Receiver. The WJ-8888-5 differs from the WJ-8888 as follows:

- (1) An additional IF bandwidth (1 kHz) is included. The additional bandwidth is incorporated by replacement of Type 72399-1 IF Filter Assembly A4 by Type 72399-8. Schematic Figure 7-9 in the manual covers the new IF filter type (see detail B on schematic). Front-panel pushbuttons change accordingly.

- (2) Upon receipt of a remote trigger (Synchronous I/O installed), the unit automatically reverts to remote operation, regardless of the current locally-selected operating mode. This feature is included primarily to facilitate master/slave operation in conjunction with the WJ-9526 Master/Slave Control Unit. To permit remote selection of remote operation, jumper WJ1 on Asynchronous I/O board A16 (see schematic Figure 7-18) is not connected and jumper JW2 is connected, as explained in circuit-description paragraph 4.5.2.8.

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AJB June 1975
Revised by DLT
August 1975