

## WJ-9195C RAPID ACQUISITION SPECTRUM PROCESSOR



### FEATURES

- Fast Scan Rate—1 GHz/second
- Broad Frequency Range: 20 – 512 MHz, expandable to 2 MHz – 1400 MHz
- High Dynamic Range—60 dB (Typical)
- Interactive RF Spectrum Display
- Control and Hand-off of up to 15 external Receivers
- High Resolution—5 kHz or 25 kHz

### DESCRIPTION

The WJ-9195C Rapid Acquisition Spectrum Processor (RASP) is a broadband receiver and spectrum display unit which offers exceptional scanning speed and dynamic range along with receiver control functions which facilitate its use as a system controller. Enclosed in a single 8.75" H x 19" W x 17" D housing, the WJ-9195C incorporates the requisite functions of a receiver front-end, and display.

The WJ-9195C has been designed to rapidly scan a user specified segment of the RF spectrum and report activity via a large electroluminescent (EL) display. All operation is effected via front panel controls with the aid of pop-up menus presented on the EL display. An auxiliary display is also included to assist in various operations. With all frequency extenders installed, the WJ-9195C can cover the 2 MHz to 1400 MHz band at a rate of 1 GHz per second, resolving the band into 25 kHz cells. For greater resolution, a 5 kHz mode is selectable. The resultant signal data is presented on 6 programmable traces which may be set up to provide a full view of the entire spectrum, or a detailed view of a specific area of interest. The scanning rate of the WJ-9195C remains constant regardless of the width of the spectrum being scanned. This results in a direct relationship between the amount of spectrum scanned and the revisit rate, and therefore, the probability of intercept. For example, a 1000 MHz span is scanned once per second, and a 100 MHz span is scanned ten times per second.

## DESCRIPTION (Continued)

In addition to the speed and display attributes of the WJ-9195C, extensive receiver control functions have been incorporated. When serving as a system controller, up to 15 external receivers may be effectively managed using the WJ-9195C as a single point of control. Complete receiver control, hand-off, and status monitoring functions are available. An auxiliary display panel, in conjunction with the control section, allows an operator to gain access to all operating parameters of the external receivers. Using a maximum of two keystrokes, the operator can easily hand-off, seize control, or monitor the status of any of the external receivers. Along with the spectral data, external receiver status is also presented on the EL display panel. The frequency assignments of the monitor receivers are displayed in a tabular format and, in addition, the receiver designator is superimposed under the signal to which it is assigned. This capability keeps the operator apprised of both signal activity and the availability of external receiver resources.

Embedded within the WJ-9195C is an optional IF section which provides complete IF bandwidth selection and demodulation capabilities. AM, FM, CW, USB, LSB, and Pulse type signals may be demodulated using IF bandwidth filters in the range of 3 kHz to 8 MHz. The IF and demodulation circuits are not engaged during scanning operations but may be utilized while the unit is in a fixed tune mode.

## FUNCTIONAL DESCRIPTION

The WJ-9195C Spectrum Processor can accept up to three pairs of antenna inputs: HF/VHF/UHF. The frequency bands associated with each pair of inputs can be

setup by the operator. These antenna inputs have been provided to allow for interfacing of the WJ-9195 to antennas which may have various frequency bands, polarization and/or directional characteristics. The frequency bands associated with the Antenna Switch can be setup by the operator via the front panel switches.

From the Antenna Switch, the signal is passed to the optional Frequency Extenders or the internal VHF/UHF receiver. The WJ-9195C Spectrum Processor can accommodate HF and/or UHF frequency extenders, providing combined coverage of 2 - 1400 MHz. Provision exists for locking to an external frequency timebase of 1, 5 or 10 MHz.

The internal receiver, under control of the Spectrum Processor, is scanned in large frequency steps and provides a 21.4 MHz wideband IF spectrum which is then routed to the IF Converter (A8) where this spectrum is down converted to a 2.5 MHz center frequency.

The output of the IF Converter is then routed to the IF Processor Assembly which is comprised of an analog to digital converter (ADC), a window multiplier, a digital to analog converter (DAC) and a Swept IF Filter Assembly which collectively serve to frequency multiply (time compress) the IF spectrum. This digital signal processing (DSP) technique allows for rapid spectrum analysis, approximately three times faster than the traditional spectrum analyzer approach.

The digital data developed by the IF Processor is then sent to the Database Processor. The Database Processor maintains the signal amplitude database for each frequency cell, based on the selected amplitude mode; real time, peak or decay, and the cell's other attributes, such as Lockout status and Antenna selection. The Graphics Formatter then selects the data required for display based on the user determined Scan scenario. The spectral data output from the Graphics Formatter is com-

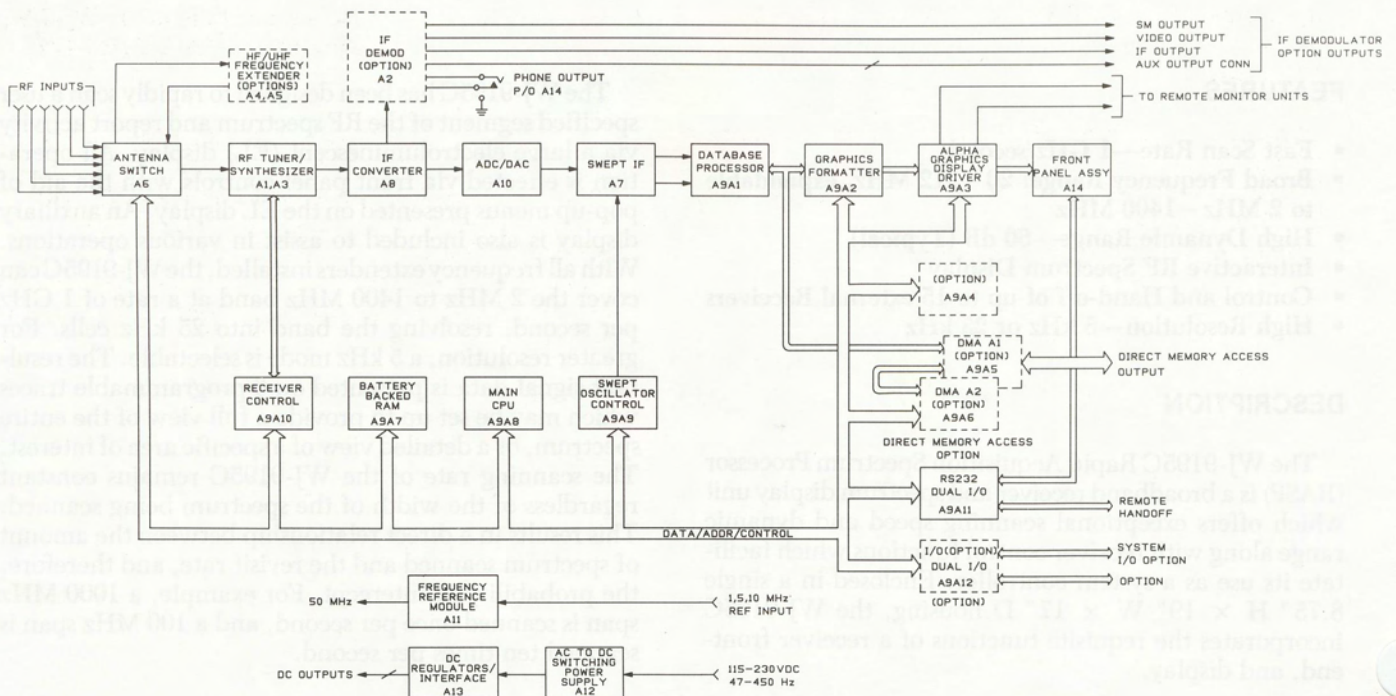


FIGURE 1  
SIMPLIFIED BLOCK DIAGRAM

bined with the alphanumeric data from the Main CPU in the Alpha Graphics Display Driver which generates the display signals for the EL panel. Once the display image information is created, it is sent to the Front Panel Assembly for display on the integral EL panel. The Alpha Graphics Display Driver also creates the information for the Remote Monitor Unit (RMU) and Remote Display Driver (RDD) options which can be connected

to the system as well.

The WJ-9195C Spectrum Processor may be controlled locally, using front panel controls, or from an external computer via RS-232 or IEEE-488 interface formats. The System I/O board (A9A12) serves to connect the external computer to the standard bus. Access to the WJ-9195C database is provided via an optional direct memory access (DMA) interface.

## SPECIFICATIONS

Frequency Range.....	20 MHz – 512 MHz Expandable to 2 MHz – 1400 MHz (1300 MHz maximum for 5 kHz cell size)
Cell Size.....	25 kHz, 5 kHz Selectable
Scan Rate.....	1000 MHz/second—25 kHz Resolution 200 MHz/second—5 kHz Resolution
Minimum Discernable Signal.....	≤ -105 dBm in 5 kHz mode
Instantaneous Dynamic Range.....	50 dB min.
MGC Range.....	30 dB
Tuning Accuracy.....	1 kHz
Input Power Requirements.....	110/220 VAC 48 – 400 Hz 175 watts nominal power consumption
Size.....	8.75" H × 19" W × 17" D
Weight.....	Approximately 60 lbs.
Operating Temperature Range.....	0°C - 50°C

## WJ-9195C OPTIONS

### WJ-9195C/HFE

HF Frequency Extender—Extends the frequency range down to 2 MHz. The /HFE option may be used with the WJ-9195C/FE.

### WJ-9195C/FE

Frequency Extender—Extends the frequency range up to 1400 MHz (1300 MHz for 5 kHz cell size). The /FE option may be used with the WJ-9195C/HFE.

### WJ-9195C/IFD

IF Demodulator—Provides complete AM, FM, CW, USB, LSB, and Pulse demodulation, using up to four (4) selectable IF Bandwidth filters, in the range of 3 kHz to 8 MHz. (Requires four WJ-9928-XXX IF Bandwidths)

### WJ-9195C/RMU

Remote Monitor Unit—Provides an external monitor driver and display unit.

Size: 8.75" H × 19" W × 5-1/4" D.

Weight: Approximately 10 lbs.

Power Requirements: 110/220 VAC 48-400 Hz.

Option includes monitor and cable.

### WJ-9195C/RDD

Remote Display Driver—Provides composite video signal for driving customer furnished remote displays. Cannot be used in conjunction with WJ-9195C/RMU.

### WJ-9195C/SIO

System Input/Output Interface—Allows an external computer to control the set-up functions of the WJ-9195C. The available interface options are RS-232, RS-422, and IEEE-488.

### WJ-9195C/HIO

Hand-off Input/Output Interface—Used to interface the WJ-9195C with up to 15 external receivers. The available interface option is IEEE-488. (Specify WJ receiver type when ordering)

### WJ-9195C/DMA

Direct Memory Access—Serves as an access port to the WJ-9195C database.—Please contact factory for details.