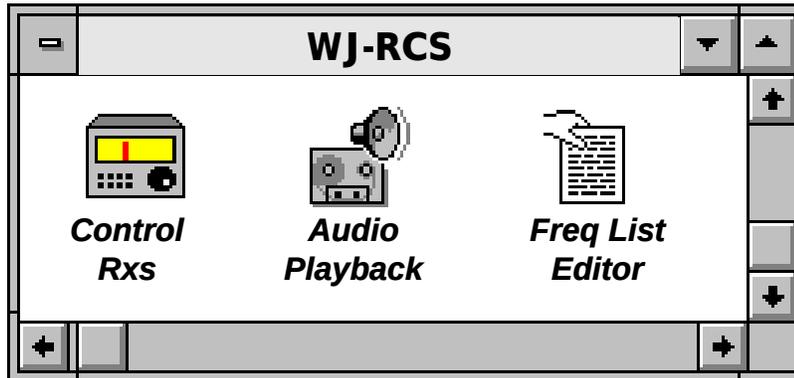


May 1997

Receiver Control Software WJ-RCS

Version 01.01.00



WJ-RCS is a collection of Windows applications for real-time control and monitoring of various **WJ** receivers. The applications operate under **MS-Windows 3.1**, **MS-Windows NT** or **MS-Windows 95**. The receiver control application includes both **IF** and **RF** signal displays that incorporate point-and-click tuning operations. It supports simultaneous operator-directed and automatic-search operations on multiple receivers. **WJ-RCS** offers built-in signal-analysis database tools for easy editing, cataloging, and hand-off to selected receivers. It also includes signal logging with digital storage of receiver audio on the controlling computer. **WJ-RCS** provides on-line **HELP**, context-sensitive **HELP**, and **HELP** file access.

WJ-RCS supports a variety of communication interfaces. An operator can connect receivers to a **Personal Computer (PC)** through **RS-232** communication ports, a **National-Instruments GPIB (IEEE-488)** PC interface card, or a **National Instruments VXI I/O** interface.

WJ-RCS consists of three stand-alone Windows applications:

1. **Control Rxs** — includes receiver control, signal list cataloging, and audio recording
2. **Audio Playback** — allows analysis of captured audio information
3. **Freq List Editor** — offers the off-line creation of a signal list database.

Features

- Windows applications to control up to 12 receivers on RS-232, IEEE-488 or VXI
- Simple Graphical User Interface (GUI) for manual operations
- Comprehensive GUI for automatic-search operations
- Search with RF pan displays
- Signal-characteristics documentation through a selectable signal list
- Manual hand-off function from signal list
- Signal monitor pan displays, using WJ-9168 Signal Monitor
- Audio recording & playing back, using multimedia computer
- On-line HELP, context-sensitive HELP & HELP file**

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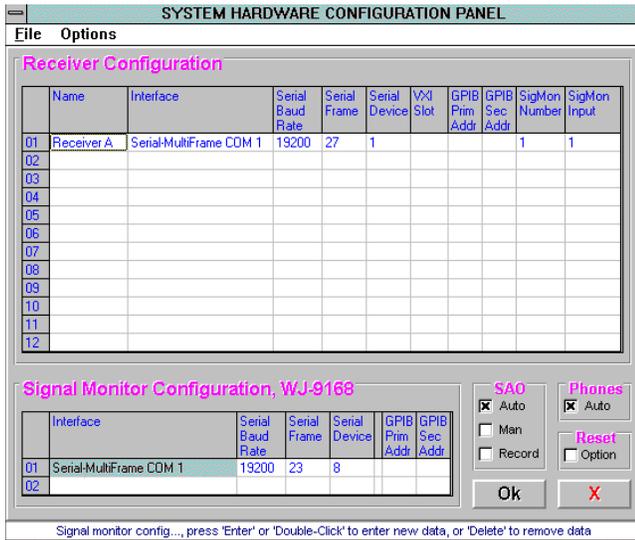
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Control RS

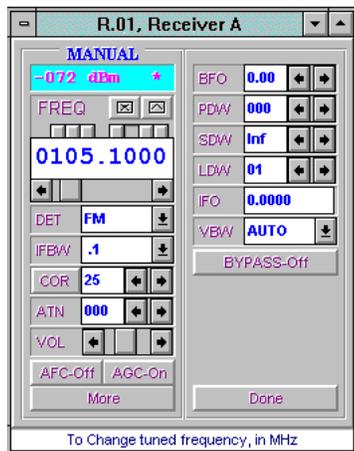
The Control Rxs application provides real-time controlling and monitoring of WJ receivers. It can control up to 12 independent receivers, of the same or different models. It requires Windows NT or Windows 95 to control more than five receivers. The Control Rxs application includes control panels for system-hardware configuration, receiver control, lockout list, signal list and audio recording.

System-hardware Configuration Panel



With the system-hardware configuration panel, an operator can easily alter system-setup or create multiple system-configuration files in advance and later download them for quick system changes.

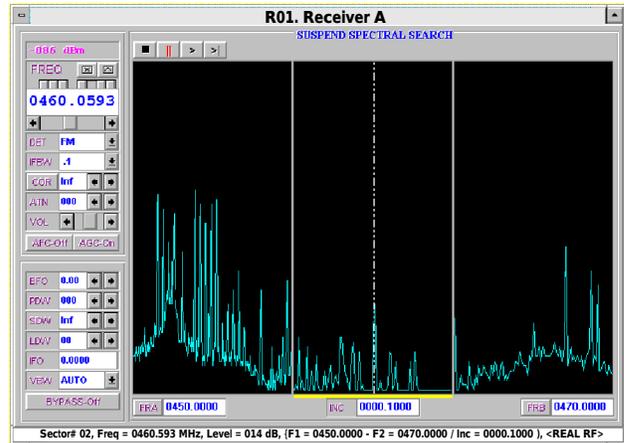
Manual-operation Control Panel



Control Rxs may provide up to 12 receiver-control panels, each fully independent and tailored to accommodate the receiver. The panels offer four different types of control operations. A simple and easy-to-use manual operation allows the user to monitor and change manual-tuning receiver parameters.

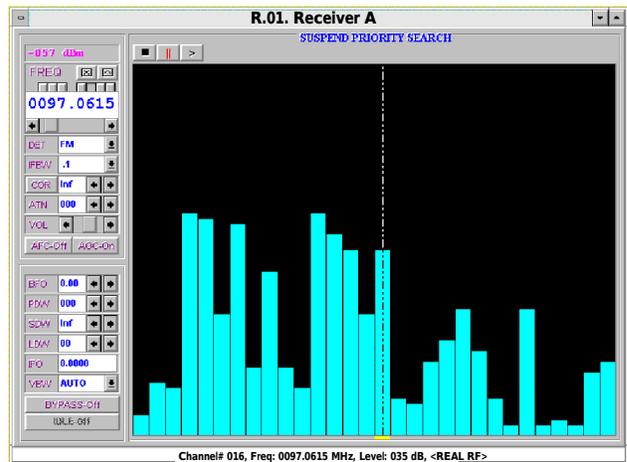
A spectral-search operation enables a user to sweep RF spectrums for signals of interest. The user may assign and search up to 10 independent sweep sectors, each containing unique Start frequency, Stop frequency, Increment frequency, and receiver setup. During the search operation, the RF pan display assists in identifying signals of interest. The operator can tune the receiver by pointing to signals on the RF pan display.

Spectral Search with 3 F1-F2 Sweep Sectors



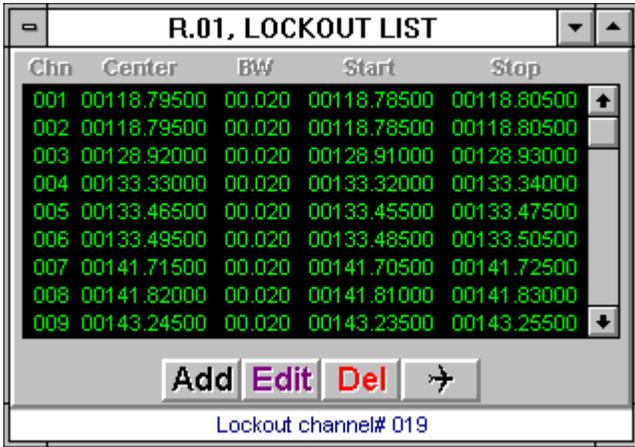
A priority-search operation allows the user to quickly step through a list of predefined signals. The user may enter up to 100 frequencies into a priority-search list. During the priority search, bar-graph displays assist in monitoring the status of each signal. As with the spectral search, the user can tune the receiver by pointing to the desired signal on the display.

Priority Search with 30 Step Frequencies



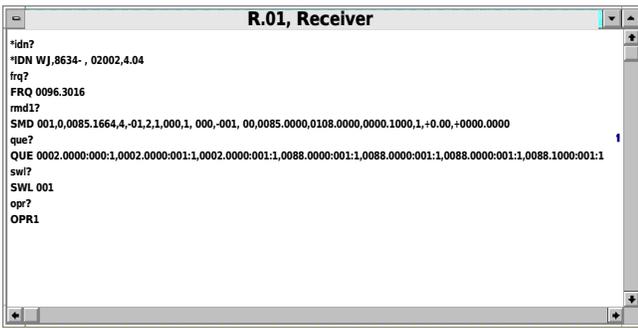
Programmable report-actions and lockout functions supplement the search operation. The report-actions function supports search for new signals, search for all signals, or skip all adjacent signals. The lockout function allows an operator to exclude RF spectrums from the spectral-search operation. The operator may define up to 200 lockout segments. The user may define lockout segments by frequencies and bandwidth, or by Start and Stop lockout frequencies.

Lockout Panel



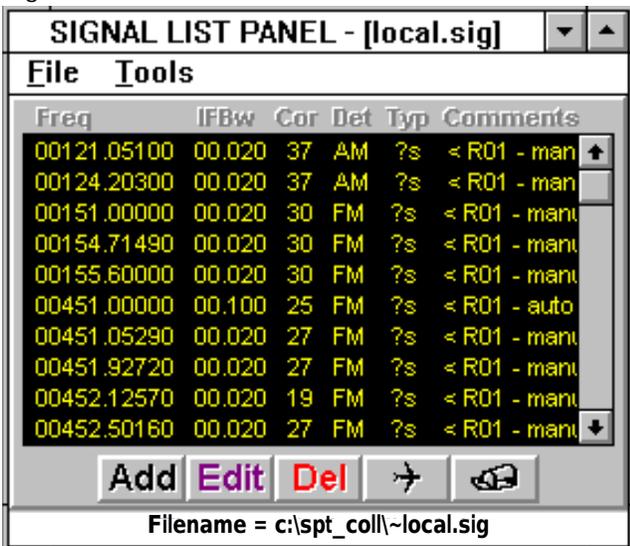
A mnemonic communication form allows the operator to type in commands or queries, and then send them directly to the receiver. This gives the operator full access and control of receivers.

Direct Communication Open-text Form



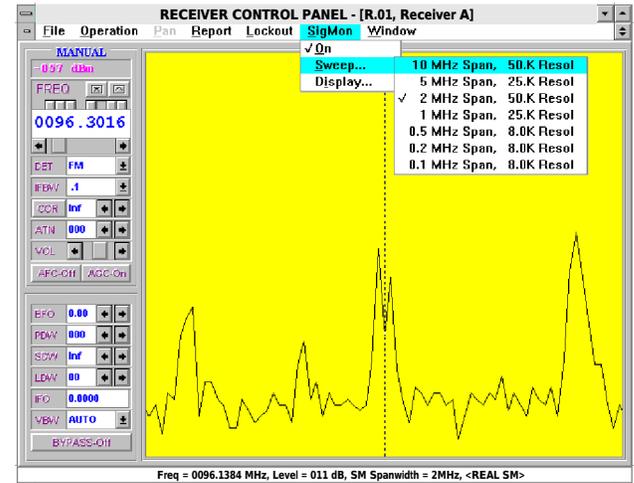
In addition to the four different operational types, Control Rxs also provide access to a signal-list editor window. The user may enter information such as tuned frequencies, IF bandwidth, COR setting, detection mode, signal identification, and comments. The user can then use the information from the list to create a priority-search list for the priority-search operation, a lockout list for the lockout function, and a hand-off signal for the hand-off operation.

Signal-list Editor Panel



If the hardware-system setup includes a WJ-9168 Signal Monitor, the operator may enable the IF Pan display function. The Control Rxs application retrieves digital IF data from up to two WJ-9168s and displays it as an IF Pan picture. The operator may select span width and resolution of IF Pan via a drop-down menu. The operator may tune the receiver by pointing to signals on the IF PAN display.

IF Pan Picture



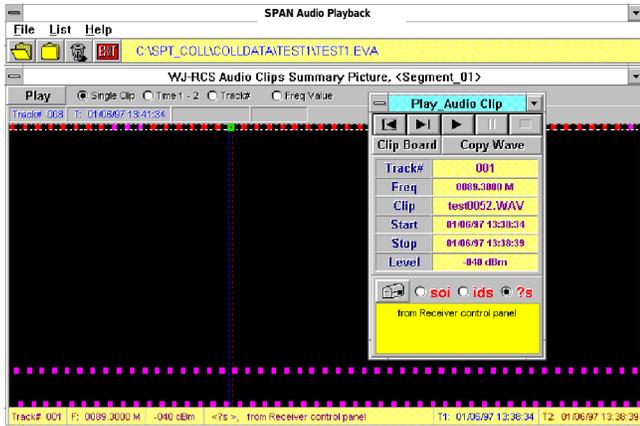
The Control Rxs application automatically detects the presence of a multimedia audio card. If the computer has multimedia capability, the operator can select the audio recording function via the main-menu bar. In order to record audio, there must be a physical connection between the audio output of the receiver(s) and the audio input of the multimedia computer. The audio recording function allows an operator to predefine the audio filename, audio source, and methods to activate the recording. The audio source may be a single receiver, or the selected audio bus on receivers that support this feature, so that the operator can select one of the system receivers for recording. For compatibility and easy file access with commercial off-the-self applications, the WJ-RCS collects and stores digital audio data in a standard Microsoft Waveform Audio-file format (WAV).

The Control Rxs application also provides on-line HELP, context-sensitive HELP, and a HELP file. On-line HELP is always available at the bottom of each receiver-control panel. This window contains a quick definition of a command button or data field indicated by the position of the mouse cursor. The HELP menu provides more comprehensive instructions, or an operator can use the F1 function key to access context-sensitive HELP.

Audio Recording Panel



Audio Playback Panel

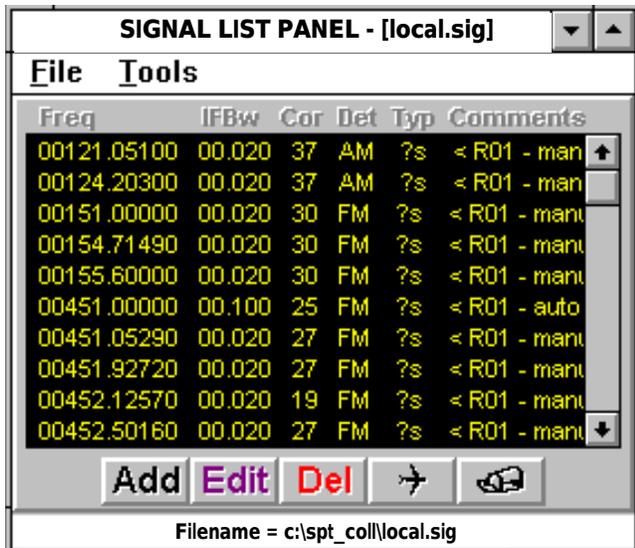


The Audio Playback application allows playback of digital audio files, created by the Control Rxs application, on a multimedia computer. It graphically displays the audio files along with their frequencies, signal strength (-dBm), and time of collection. It also performs frequency cross-references between audio files and the user-selectable signal list. When the program finds a matching frequency, it displays comments and signal classification in the signal list along with the audio-wave files. Audio Playback allows direct access to a signal list. An operator can enter frequency information pertaining to individual audio files, classify the data, and then attach comments into a default or user-specified signal list. The operator can classify each signal in the list as unidentified, identified, or a signal of interest. The Audio Playback application includes both context-sensitive HELP and HELP file operations.

A user can playback audio by pointing to the graphical audio clip and clicking a mouse button. The application provides playback:

- By individual audio clips
- Sequentially by time of collection
- Time-sequentially by frequency
- Time-sequentially by track assignment.

Freq-list Editor Panel



Freq List Editor

The Freq(uecy) List Editor application allows an operator to independently create and edit signal-list files. The operator may create a new signal list from scratch or import data from existing files. Editing tools are available such as add, new data, edit, delete, copy, cut, and paste. The Freq List Editor also provides a quick on-line HELP window at the bottom of the form. Depending on the position of the mouse cursor, the program automatically updates the window with HELP information.

Both the Control-Rxs and Audio Playback applications can use the signal-list files. In the Control Rxs application, an operator uses signal-list data to create lockout information, form a priority-search list, or allow manual setup of receiver operation (hand-off function). The signal-list data also helps identify collected audio files during post-analysis in the Audio Playback application.

Supported Receivers

- WJ-860X Miniceptor Family with RS-232 interface
- WJ-860XA Miniceptor Family with RS-232 interface
- WJ-8609A Wideband Miniceptor Family with RS-232 interface
- WJ-8611 VHF/UHF Receiver
- WJ-8629 ViXceptor VHF/UHF Receiver
- WJ-8634 VXI VHF/UHF Receiver Family
- WJ-8635 HF/VHF/UHF Receiver Family
- WJ-8654 Microceptor Family
- WJ-871XA HF Receiver Family
- WJ-8721 Digital HF VXI Receiver
- WJ-9902 Miniceptor Frame
- WJ-9903 Miniceptor Frame
- WJ-9904 Microceptor Frame
- WJ-9908 Miniceptor Frame

Supported I/O interfaces

- RS-232, Single-drop or Multidrop using PC Com Ports
- National Instruments GPIB PC Interfaces (IEEE-488)
- National Instruments VXI Bus Slot-0 interface

Hardware Requirements

- IBM PC or compatible
- MS Windows 3.1 or higher, MS Windows NT, or MS Windows 95
- RS-232, GPIB-488 or VXI I/O interface
- Standard multimedia audio card, (for audio playback & recording)
- WJ receiver(s)
- Interface cable(s)

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