

# SCR200

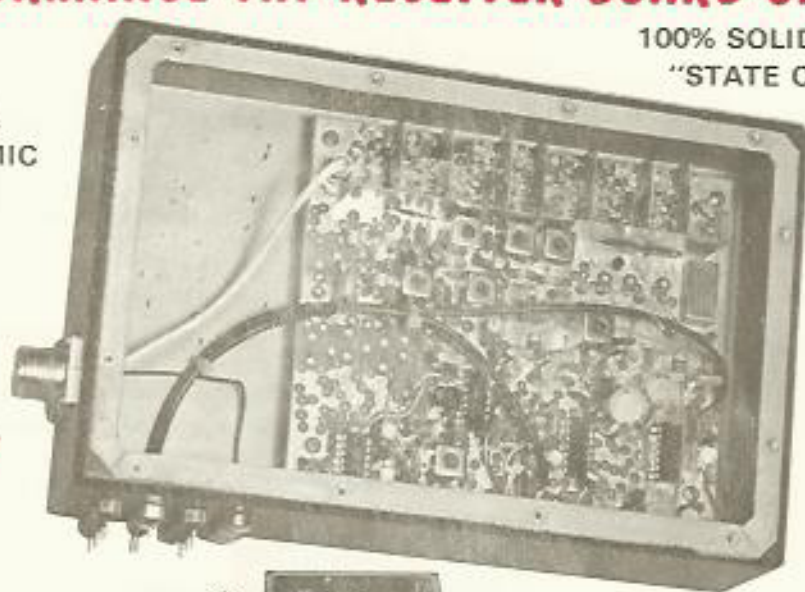
## HIGH PERFORMANCE VHF RECEIVER BOARD OR ASSEMBLY

100% SOLID STATE — LATEST  
"STATE OF THE ART" DESIGN

8 POLE CRYSTAL  
+ 4 POLE CERAMIC  
IF FILTERS!

USED IN THE  
SCR1000 REPEATER!

SUPER SENSITIVITY,  
SELECTIVITY, & WIDE  
DYNAMIC RANGE



8 POLE  
FRONT END  
FILTER!

SIGNAL STRENGTH,  
DISCRIMINATOR  
& DEVIATION  
METER OUTPUTS!



RACK MOUNT LINK RECEIVER OPTION

### INTRODUCTION

The Spectrum Communications Corp. SCR200 Receiver utilizes the very latest in design techniques and "state of the art" components to achieve what has to be the very finest VHF Receiver Board or shielded sub-assembly on the market today! A maximum of ICs and other sealed components (such as a true Double-Balanced Mixer and monolithic Crystal & Ceramic Filters) have been incorporated for optimum long-term circuit stability and performance, as well as circuit simplicity. Its very wide dynamic range (for excellent rejection of spurious responses, desense, and "intermods"), plus its superior sensitivity & selectivity make the SCR 200 ideal for Repeater or Link Receiver, Monitor, Transceiver or other special purpose application.

### CIRCUIT DESCRIPTION

The Receiver Front End consists of an RF Preamplifier stage followed by a second RF Amplifier stage. The transistors used for this application are new, state of the art types which are designed to provide an extremely low noise figure, while simultaneously giving high gain, and an extremely wide dynamic range. Eight "Hi Q" Preselector Resonators are intermixed with the two RF transistors. These tuned circuits provide extremely good rejection of strong out of band signals. The Double Balanced Mixer converts the VHF input signal down to the 21.4MHz IF frequency. (This type of mixer inherently has extremely wide dynamic range characteristics and they are widely used in microwave receiver applications due to their superior performance capabilities.) The Local Oscillator chain consists of a third overtone crystal oscillator stage followed by two multiplier stages. "Double-tuned" filter sections are used through-out the LO chain in order to filter-out spurious signals. This results in an extremely "clean" drive signal to the Mixer, and

therefore super-low overall receiver spurious responses. The first mixer is immediately followed by an 8 Pole first IF Crystal Filter and a 21.4MHz IF Amp. stage. A 21.4MHz IF frequency is used in this design since it greatly helps in the attenuation of image and spurious responses. This high frequency IF is far superior in this respect to the commonly used 10.7MHz IF stages.

The 21.4MHz first IF signal is fed to a multi-purpose second IF IC. This IC performs the functions of second LO and Mixer (also doubly-balanced to reduce spurious responses). It also includes 455KHz second IF Amplifier and limiter stages, as well as the FM Quadrature Detector, and high frequency Squelch Noise Amp. The second mixer's output is filtered by a 4 Pole Ceramic Filter which provides additional skirt selectivity for unusually superior adjacent channel rejection. In addition, the receiver incorporates a new advanced design Squelch circuit which has many benefits over older, simpler designs. The built-in hysteresis circuit reduces squelch "chop-out" effects on weak, fluttery mobile signals. This circuit keeps the squelch "open" even though the weak received signal may have faded a few dB below the original threshold (opening) point.

The AF Amp IC will supply up to 5W. of very clean and clear audio output to a 4 $\Omega$  minimum load. The audio is very low in distortion, and fidelity and quality are unusually good!

In addition - in response to customer demand, the SCR200 Receiver also includes built-in Discriminator, Deviation, and Signal Strength Meter functions! These functions can be very valuable to the control operator or maintenance technician at the receiver site since he can quickly and conveniently check all of the users on the air for Peak Deviation, Frequency Error and relative Signal Level! (Accuracy is typically within  $\pm 1\text{KHz}$  @ +10 to +35°C.) These functions (if used) can be wired to a front panel switch and 1mA DC meter.



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