RA 6390
RA 6775

Manual & Computer Controlled HF Receivers

RACAL

Racal Communications, Inc. is pleased to introduce a new generation of Modular High Frequency receivers:

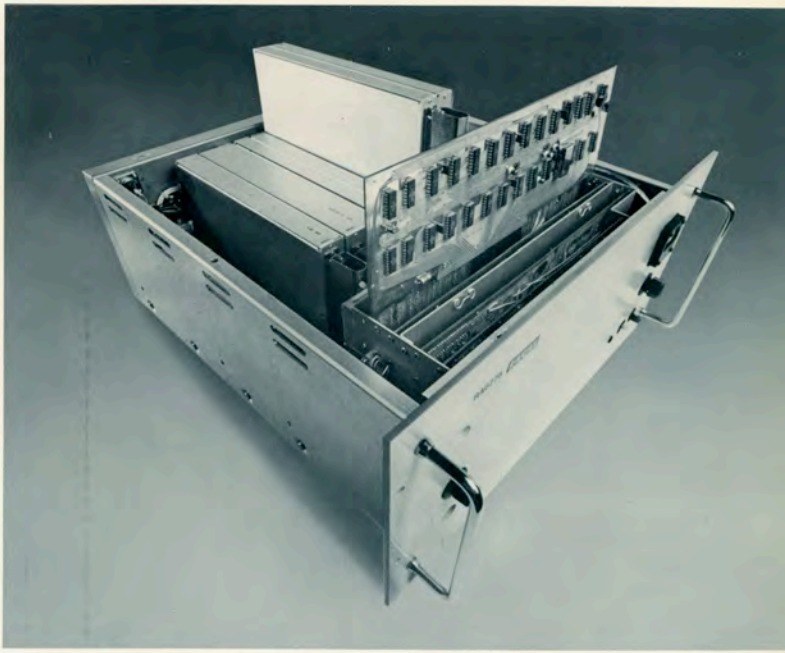
The RA 6775
The RA 6390

Designed specifically for surveillance and communication applications and site update programs. This family of receivers is easily integrated into existing operator controlled systems while simultaneously providing the capability for full computer controlled system architecture.

The RA6775/RA6390 series of receivers is the culmination of extensive design effort to provide high performance HF receivers that are easily adapted to conform with specialized requirements.

RA 6775 Computer Controlled HF Receivers
RA 6390 Manual & Computer Controlled HF Receivers

• Commonality of Modules Throughout Receiver Series • Frequency Range of 1.5 to 30 MHz • Fully Synthesized Tuning Increments in 10 Hz Steps • Computer Controlled Via Serial Asynchronous Command Word • Intermodulation (odd order intercept point) of +35 dBm • Plug-In Modular Construction • Synthesized ± 8kHz BFO



Optional Features

Specialized I/O Structures
Extended Frequency Range Down to 15 kHz
Additional Detection Modes, ISB, FSK, FM
Choice of Alternate Sideband and IF Filters
BFO Accuracy of ±1 Hz
Frequency Stability of ±1 part in 10^7
Selectable Baud Rate
455 kHz IF Converter Module

RA 6775 / RA 6390 Specifications

Frequency Range
1.5-30 MHz (15 kHz-30 MHz optional)

Frequency Selection
10 Hz increment

Frequency Stability
±1 part in 10^6 (standard)
±1 part in 10^7 (optional)

Modes of Operation
USB/A3J Upper Side-band
LSB/A3J Lower Side-band
ISB/A3B Independent Side-band (optional)
CW/A1 Continuous Wave
AM/A3 Amplitude Modulation
FSK/F1 Frequency Shift Keying (optional)
FM/F3 Frequency Modulation (optional)

Noise Figure
13db (typical)

Sensitivity
SSB/ISB 0.5 microvolts for 10 dB S+N to N ratio in a 3 kHz bandwidth.
CW 0.25 microvolts for 10 dB S+N to N ratio in a 300 Hz bandwidth. AM 30% mod. 1.5 microvolts for 10 dB S+N to N ratio in a 3 kHz bandwidth.

Intermodulation
Third order intercept point +35 dBm minimum

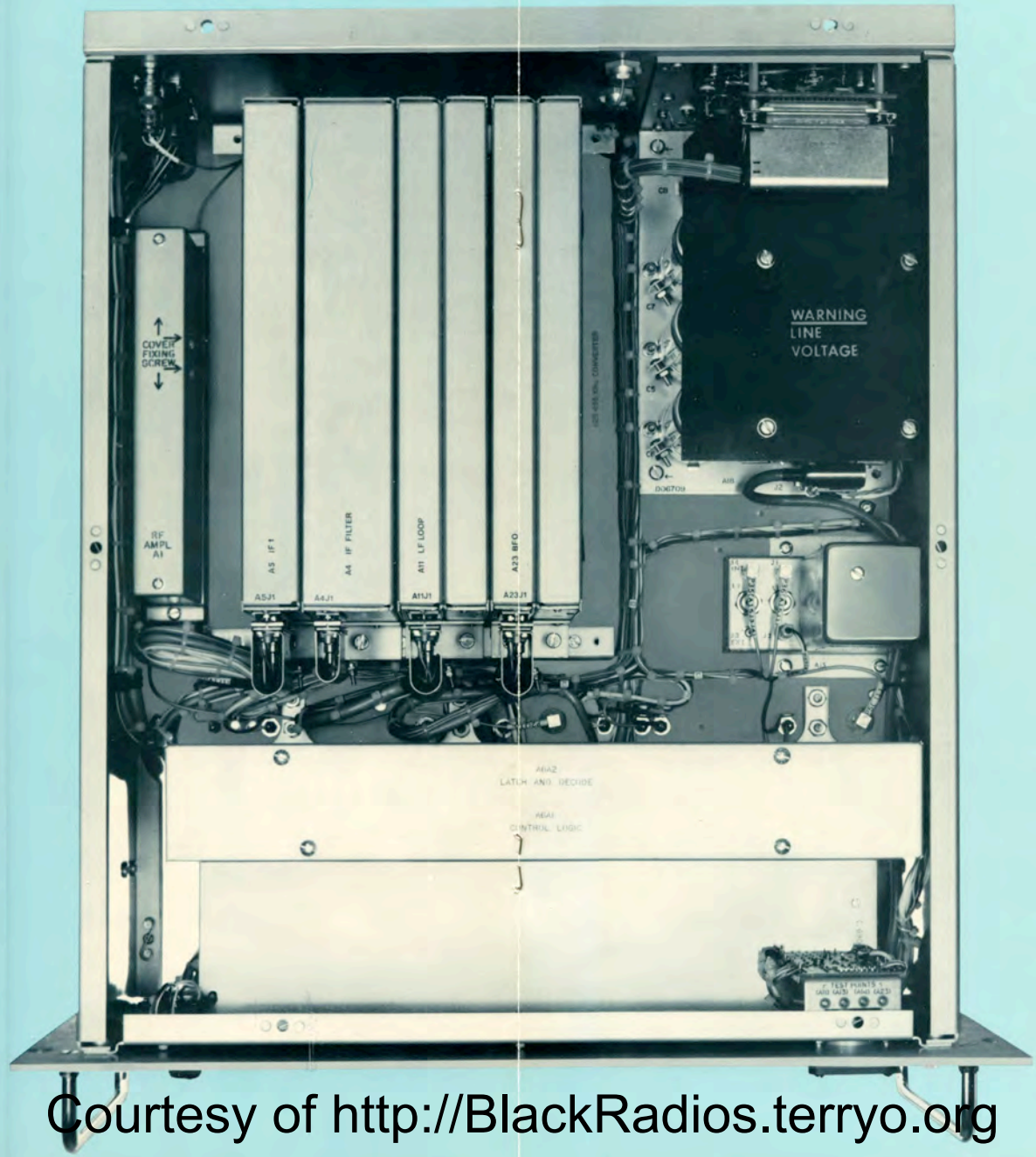
Image/Spurious Rejection
80 dB.

Cross Modulation
With a wanted signal of not less than 50 microvolts, in a 3 kHz bandwidth, an unwanted signal, 30% modulated, 100 kHz or more removed from the tuned frequency will be greater than 400 millivolts to produce an output 20 dB below the output produced by the wanted signal.

Blocking/Desensitization
With a wanted signal of not less than 100 microvolts, an unwanted signal 100 kHz or more removed from the tuned frequency will be greater than 1 volt to reduce the wanted output by 3dB.

Receiver Control
Remote computer via serial asynchronous command word or MA6003 Command Control Unit or Manual, Front Panel Controls (RA6390 only)

Controlled Functions
Frequency in 10 Hz increments, Detection Mode, IF Bandwidth (AM & CW modes only 0.3, 3, and 8 kHz), AGC time constant, BFO offset (±8 kHz) 10 Hz increments, IF Gain, Receiver Status indication



Data Baud Rate
9.6 K baud or 19.2 K baud

Selectivity
SSB/ISB Passband at – 3 dB: 250 Hz to 3000 Hz. Passband at – 60 dB: – 400 Hz and + 4100 Hz.
CW Passband at – 3 dB: 300 Hz nominal. Passband at – 60 dB: 2.5 kHz max.
AM/CW Passband at – 3 dB: 3 kHz max. Passband at – 60 dB: 12 kHz max.
AM Passband at – 3dB: 8 kHz nom. Passband at – 60 dB: 30 kHz max.

Input Impedance
50 ohms nominal: Type BNC connector

AGC
Range: An increase in input of 100 dB above 1 microvolt will produce an output change of less than 6 dB.
Time Constants (USB/LSB/ISB):
Short - 10 m/s attack, 10 m/s decay
Medium - 15 m/s attack, 200 m/s decay
Long - 10 m/s attack, 4 second decay

Dynamic Range
120 dB minimum

Outputs
Phone Output: 10 mw nominal into 600 ohms at 1% distortion
Line Outputs: Independently adjustable to plus 6 dBm into 600 ohm balanced load. Distortion 1% maximum
IF Output: – 10 dBm into 50 ohms
Receiver Status via separate buss to MA6003 Command Control Unit or computer.

Design
Full solid state, plug-in modular construction

Environment
The equipment is designed to operate in environments compatible with MIL-E-4158
Operating Temperature: 0° to +55°C
Storage Temperature: –40° to +70°C
Altitude: Operation to 10,000 ft.

Primary Power
115/230 volts, ±10%, 48-420 Hz, single phase.

Power Consumption
80 watts (nominal)

Dimensions
Height: 8.75 in. (22.2 cm)
Width: 19 in. (48.3 cm)
Depth: 20 in. (50.8 cm)

Weight (approx.)
45 lbs (20.3 kg.)

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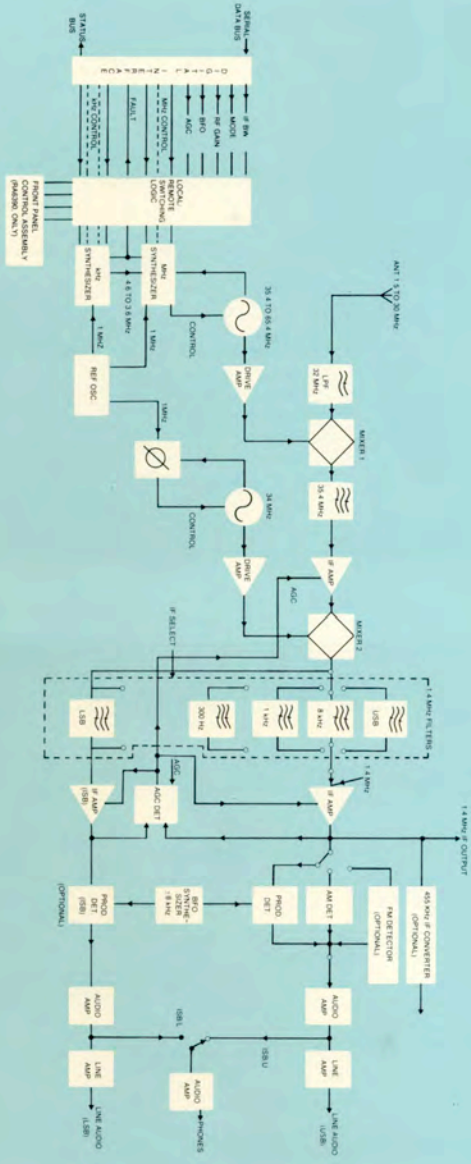
Simplified Principle of Operation

The simplified block diagram shows the basic principle of operation of the RA6775/RA6390 family of receivers.

The input signal is fed from the antenna via a 32 MHz low pass filter to the first mixer where it is combined with a variable frequency output from the synthesizer. This frequency, in the 36.9 to 65.4 MHz range, is selected via the computer or from the front panel controls through the common local/remote switching logic.

The IF output from the first mixer is fed via a 35.4 MHz bandpass filter and an IF amplifier to the second mixer, where it is combined with a 34 MHz output from the synthesizer to provide a 1.4 MHz IF output. Dependent upon the mode selected, the 1.4 MHz signal is then fed to the SSB or IF selectivity filters.

The output from the selected filter passes via the main IF amplifier to an AGC amplifier and detector which controls the gain of the various IF amplifier stages, and to the detector stage. A product detector is provided for CW/SSB modes and an envelope detector for DSB. For CW, a synthesized BFO is provided whose frequency can be varied 8 kHz from the 1.4 MHz IF. In the ISB mode two identical IF amplifiers provide separate upper and lower sideband outputs. An FM detector is provided as an optional feature. After detection, the signals are fed to the appropriate audio amplifier and output connectors.



RA6775/RA6390 Receiver Series Simplified Block Diagram

Command Word Format

The RA6775/RA6390 Receiver series is controlled via a character oriented serial asynchronous command word. The receiver also provides monitoring of all command information when requested by the computer. Receiver address decoding and data rate selection is by means of jumper pins in the external I/O connector. This feature permits the receiver to be installed in any assigned position.

The following table depicts a typical command word format. Several variations of format are available and can be tailored to specific requirements.

Control of the receiver may also be furnished by a local or remotely located MA6003 Receiver Command Control Unit.

CHARACTER	COMMAND/STATUS WORD								
1	SYNC BYTE								
2	STATUS OUT	STATUS REQ.	ADDRESS						
3	FREQUENCY 10 MHz							FREQUENCY 1 MHz	
4	FREQUENCY 100 kHz							FREQUENCY 10 kHz	
5	FREQUENCY 1 kHz							FREQUENCY 100 Hz	
6	FREQUENCY 10 Hz							MODE	
7	0	SYNTH LOCK	AGC	AGC				BANDWIDTH	
8	BFO 100 Hz							BFO 10 Hz	
9	GAIN							BFO 1 kHz	

Specifications

Continued from page 5

Front Panel Control and Indicators

Power/On Off Switch
Power Circuit Breaker
Power Indicator Lamp
"Fault" Warning Lamp
Meter
Meter Switch
Line Level Pre-set Adjust
Phone Jack
AF Gain Control

The following additional controls apply to the RA6390 only.

Tuning Control
Tuning Rate Selector
MHz Tuning Switch
LED Frequency Display, 10 Hz
Mode Selector
IF Bandwidth Selector
AGC Time Constant Control
BFO LED Frequency Display
IF Gain Control

Rear Panel Facilities

Antenna Input Connector (Type BNC)
IF.1 Output Connector (BNC)
IF.2 Output Connector (BNC) (Optional)
5 MHz REF In/Out Connector (BNC)
Power Input Connector
Ground Terminal
Remote Control/Monitor Input/Output Connector
Line AF Outputs, 600 ohms balanced

Specifications subject to change without notice.

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Receivers
Synthesized LF/MF/HF Receivers for Communications or Surveillance
Computer Controlled Synthesized HF Receivers
Local/Remote Controlled HF Receivers

Receiving Systems
HF/DF Receiving Systems, Panoramic Receiving Systems
Frequency Measuring Receiving Systems
Full Spectrum Receiving Systems
Master/Slave Hand-off Systems

Transceivers
Synthesizer Controlled HF SSB Manpack Transceivers
Crystal Controlled HF SSB Manpack Transceivers
"Flyaway Pack" 100 Watt HF SSB Field Radio Stations

Control and Ancillary Units
Receiver Control/Command Control Units
Local/Remote Control Units
Panoramic Adapters
Frequency Measuring Adapters
HF Receiver Pre-selection and Protection Units
High Speed Morse Units
Voice Privacy Units

Battery Packs and Chargers
Battery Chargers
Solar Battery Chargers
Nicad Battery Packs
Rechargeable Battery Packs

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