**RA3711 RA3712**

**MODULAR HF RECEIVERS**

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**KEY FEATURES**
- Frequency range 0.5-40MHz
- High RF performance
- Modular construction
- Wide range of optional modules
- Automatic scanning of channels and frequency
- Serial ASCII or IEEE 488 control
- Controller of slave receivers
- Simple to operate
- Comprehensive BITE

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**DESCRIPTION**

These high performance HF receivers cover the extended frequency range 0.5-40MHz.

Using a highly modular design, the same frame and modules can be configured to assemble receivers to meet a variety of different applications.

They are part of the successful RA3700 Series and comprise single and dual variants. A range of optional modules can be added to enhance the receiver facilities.

The RA3711 is a Single receiver, whilst the RA3712 is a Dual version.

Each receiver includes, as standard, a serial ASCII remote control interface with a built-in multi-addressing capability of up to 100 receivers. Alternatively, an IEEE 488 interface may be fitted. Slave receivers may be controlled in a number of ways: by computer; by using the RA3700 receiver control unit; or by the RA3711 and RA3712 receivers, which have built-in controller facilities. All front panel operating functions except power on/off switching can be controlled remotely.

Single function buttons control the most commonly used operations and four keys control the receivers’ many special facilities by means of a menu system.

Comprehensive built-in test equipment (BITE), locates faults to module level and may be controlled remotely as well as locally from the front panel.

The frequency synthesizer is patented in the UK (2026268) and the US (4204174).

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**RACAL COMMUNICATIONS**
RA3711 RA3712
TECHNICAL SPECIFICATION

Frequency Range
0.5MHz to 40MHz in 1Hz or 10Hz steps.

Tuning
By numeric keypad or single spinwheel tuning knob with selectable tune rate.

Mode of operation
- CW
- AM
- FM
- USB/LSB
- R2A, H2A, J2A, R3E, H3E, J3E

Options:
- SSB
- BFO
- FSK
- F16

BFO
Tunable ±9.99kHz in 10Hz steps using the main tuning knob or by keypad entry.

Channel store
100 frequencies in non-volatile EEPROM memory with associated mode, bandwidth, AGC and BFO settings. Bulk erase of the memory is possible from the front panel or remotely.

Scan modes
- Channel scan between designated channels with selected dwell time on each channel (0.1 to 9.99s).
- Frequency sweep between any two frequencies with selected step size (0.1kHz to 9999kHz) and sweep rate (1kHz to 999.99kHz). Each step is mode selectable to be either on or off on the signal of a group of a threshold set on the front panel with the IFF gain control.

Frequency stability
One of the following optional frequency standards may be fitted:
- Frequency accuracy ±1.5 ppm in ±10ppm.
- 9420 oven owned oscillator
  - Temperature stability ±2ppm in ±10°C.
  - Ageing ±1ppm in ±10°C per year after 3 months continuous operation.

Sensitivity
SSB/CW: A signal of 1μV (1μV emf) in 1kHz bandwidth gives an S+N/N of 20dB.

- AM: A signal of 10μV (1μV emf) in a bandwidth of 1kHz gives an S+N/N of 20dB with the RF amplifier on.

Sensitivity
SSB/CW: A signal of 1μV (1μV emf) in 1kHz bandwidth gives an S+N/N of 20dB.

AM: A signal of 1μV (1μV emf) in a bandwidth of 1kHz gives an S+N/N of 20dB with the RF amplifier on.

Selectivity
The following bandwidths are standard:
- USW: 2kHz
- LSB: 2kHz
- Symmetrical: 500Hz
- 3kHz: 2kHz
- 6kHz: 1kHz
- 12kHz: 1kHz

Other filters are available as options. A total of 5 filters (giving 7 bandwidths) are fitted in the basic receiver. The optional IF filter module allows a further 7 filters to be added.

Reciprocal mixing
With a wanted signal of 1μV emf in 1kHz bandwidth, an unwanted signal 20kHz removed must be greater than 50μV (2dB) above the wanted signal to give a noise level equal to the output produced by the wanted signal. At 1kHz removed the difference must be greater than 100μV (10dB).

Out of band intermodulation products
RF amplifier on
With two -13dBm (100mV emf) signals separated and removed from the wanted signal by 25kHz, the third order intermodulation products will be
- less than 60μV (60dB) below the interfering signals.
- Third order intercept point not less than +10dBm (+10dB). RF amplifier off
- Third order intercept point typically not less than +30dBm.

In band intermodulation products
Two in band signals of -23dB (100mV emf) with 600Hz spacing produce third order intermodulation products not greater than -50dB at the output and line input.

Blocking
With a wanted signal of -53dB (1μV emf) and an unwanted signal 20kHz removed must be greater than +7dBm (+130dB) to reduce the output by 3dB.

Cross modulation
With a wanted signal of -53dB (1μV emf) in 1kHz bandwidth, an unwanted signal 30% modulated, more than 20kHz removed must be greater than +10dBm (+170dB) to produce an output 2dB below the output produced by the wanted signal.

External spurious responses
Spurious response rejection not less than 80dB (90dB).

Image and IFF rejection
Image and IFF rejection not less than 80dB (90dB).

Internal spurious responses
Typically fewer than 5 internal spurious responses give an output not more than 3dB above the receiver noise level in 1kHz bandwidth. None give an output more than 5dB above the receiver noise level in 1kHz bandwidth.

Antenna input
- Input impedance 50 ohms nominal.
- The receiver will withstand, without damage, input signals of up to 50V emf continuously.

AGC
An increase in input of 120dB above -10dBm (2μV emf) produces an output change of less than 2dB.

Weight
Approximately 14kg (31 lb) for the basic RA3711 receiver. Approximately 10kg (44 lb) for the RA3712 receiver.

Power supply
100, 120, 220, 240V 45-65Hz.

Specified voltage levels over the range -15% to +10% relative to taps. Withstands a mains surge of ±50% for up to 1 second without damage.

Power consumption approximately 90W for the basic RA3711 receiver. Power consumption approximately 90W for the RA3712 receiver.

Environmental
The full Environmental Specification is given in the Racial Document R350 (Issue 5.1) available on request. The equipment is suitable for operation in fixed or transportable installations.

Dimensions
Height 135mm (5.31"")
Width 485mm (19"")
Depth 450mm (17.7"") behind front panel.

Note: Figures in [] are typical values.