

# RA3701 RA3702

## MODULAR HF RECEIVERS



### KEY FEATURES

- Frequency range 150kHz to 30MHz.
- 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 BTE.

### DESCRIPTION

This family of high performance HF receivers covers the frequency range 150kHz to 30MHz.

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

The family includes single and dual receivers and a range of optional modules may be fitted to enhance the receiver facilities. The following receivers are available:-

RA3701 Single HF Receiver with front panel controls.

RA3702 Dual HF Receiver with front panel controls.

Each of the receivers 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 is available.

IEEE based receivers may be controlled in a number of ways: by computer; by using the RA3700 receiver control unit; or by the RA3701 and RA3702 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' more special facilities by means of a menu system.

Comprehensive built-in test equipment (BTE) access points to module level and may be controlled remotely as well as locally from the front panel.

The RA3701 is recommended design in the UK (G1039960) and the Federal Republic of Germany (RA1426196).

The frequency converter is permitted in the UK (G126208) and the UK (G126111).



RACAL COMMUNICATIONS

# RA3701 RA3702

## TECHNICAL SPECIFICATION

### Frequency range

150kHz to 300kHz in 10kHz or 20kHz steps.

### Tuning

By numeric keypad or single operational tuning knob.

### Reciprocal mixing

With a wanted signal of  $-115\text{dBm}$  (1 $\mu\text{V}$  rms) in a 2.7MHz bandwidth, an unwanted signal 20dB removed must be greater than  $+1\text{dBm}$  ( $\approx 10\text{mV}$ ) to produce an output 20dB above the output produced by the wanted signal.

### AGC

Automatic gain control for the receiver. Adjustable using the front panel volume control. This is switched off from the front

### Frequency stability

(from 100kHz to 300kHz range)

In either mode scanning may be halted on detection of a signal above a threshold set at the front panel with the  $F$  gain control.

#### Frequency stability

One of the following optional frequency standards may be fitted:

(a) TCXO

Accuracy  $\pm 1.5$  in  $10^6$

9442 ovened oscillator\*

Temperature stability  $\pm 0.3$  in  $20^\circ\text{C}$

Ageing

$\pm 3$  in  $10^6$  per day after 3 months continuous operation.

(b) 9420 ovened oscillator\*

Temperature stability  $\pm 1$  in  $20^\circ\text{C}$

Ageing

$\pm 5$  in  $10^6$  per day after 3 months continuous operation.

\*Full details in Royal Data Publications

RD57 and 627.2

#### Stability

For the frequency range 2.5 – 30MHz:

938700: A signal of  $-11.5\text{dBm}$  (1 $\mu\text{V}$  rms) in a

2.7MHz bandwidth gives an S+N of 14dB

(1kHz) with the IF amplifier on and 12dB (12dB)

with the RF amplifier off.

AR: A signal of  $-10.6\text{dBm}$  (1 $\mu\text{V}$  rms) 50%

modulated at 1000 Hz in a 600kHz bandwidth, gives an

S+N of 14dB (1kHz) with the RF amplifier on

and 12dB (12dB) with the RF amplifier off.

#### Selectivity

The following bandwidths are standard:

150 1.2kHz

150 2.7kHz

### Distortion

With a wanted signal of  $-25\text{dBm}$  (100 $\mu\text{V}$  rms) in a 2.7MHz bandwidth, an unwanted signal 20% modulated, more than 20dB removed must be greater than  $+1\text{dBm}$  ( $\approx 10\text{mV}$ ) to produce an output 20dB above the output produced by the wanted signal.

#### General spurious responses

Spurious response rejection not less

than 60dB (20dB)

#### Image and IF rejection

Image and IF rejection not less

than 50dB (20dB)

#### Internal spurious responses

Typically lower than 3 internal spurious responses,

give an output more than 20dB above the receiver

noise level in a 2.7MHz bandwidth. None give an

output more than 60dB above the receiver noise

level in a 2.7MHz bandwidth.

#### Antenna input

(a) Input impedance 50 ohms nominal

(b) The receiver will withstand, without damage,

transient signals of up to 50V and continuously

(c) Rejection from antenna input

0–30MHz: Not greater than  $-60\text{dBm}$

(1 $\mu\text{V}$  rms)

30–100MHz: Not greater than  $-65\text{dBm}$

( $\approx 1.8\text{mV}$ )

#### AGC

An increase in input of 120dB above  $-171\text{dBm}$

0.4V rms produces an output change of less

than 3dB.

Short medium and long decay times may be

selected from the front panel. When the mode is

changed the system automatically selects the best

to meet either RF signal level or AF test level.

#### Remote Control

One of the following interfaces is fitted:

(a) Serial ASCII compatible with IEC11

recommendation V14 and ICA Standard

9625A. Compatible with V20 91213C.

Data rate may be programmed in the range 0.5 baud

to 9600 baud.

(b) IEEE 488 complying with AGO IEEE Std

488-1979.

#### Power supply

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

Operates to full specification over the range  $-15\%$

to  $+15\%$  relative to type. Intermittent mains surge

of 0.55V for up to 1 second without damage.

Power consumption approximately 80W for the

basic RA3701 receiver.

Power consumption approximately 80W for the

RA3702 receiver.

#### Environmental

The full Environmental Specification is given in

Royal Document 1329 (Issue 1.1) available on

request. The equipment is suitable for operation in

fixed or transportable installations.

Operating temperature  $-10^\circ\text{C}$  to  $+55^\circ\text{C}$

Storage temperature  $-40^\circ\text{C}$  to  $+10^\circ\text{C}$

Relative humidity 95% at  $40^\circ\text{C}$ .

#### Dimensions

Height 132mm (5.25 in)

Width 402mm (15.8 in)

Depth 450mm (17.7 in) (without front panel)

#### Weight

Approximately 14 kg (31 lb) for the basic RA3701

receiver.

Approximately 20 kg (44 lb) for the RA3702