RA 3796
MULTIPLE DIGITAL HF RECEIVER UNIT

KEY FEATURES
- Six full performance receivers in single 4U 19" rack unit
- Frequency range 10kHz to 30MHz
- High performance RF circuits
- Digital Signal Processing
- Full remote control of all RA3790 series features
- Automatic scanning of channels and multiple frequency ranges
- User programmable digital IF filters providing up to 100 bandwidths
- Tunable IF notch filter plus passband tuning
- Serial RS422 or Ethernet Remote Control
- Wide range of options
- Modular construction
- Comprehensive Built In Test Equipment (BITE)

DESCRIPTION
The RA3796 is a member of the RA3790 series of digital HF receivers. The RA3796 provides six independent, high performance HF receivers in a single 4U 19" rack unit with integral power supply and cooling facilities. In 19" rack installations, the RA3796 provides three times the receiver density of the RA3792/4 dual receivers. The RA3796 is the ideal choice for multiple receiver installations for either remote operator or computer control.

Each receiver covers the frequency range 10kHz to 30MHz with functions such as IF filtering, AGC and demodulation being implemented using digital signal processing techniques. The receivers provide the high level of IF performance required when operating in the crowded HF spectrum, and particular attention has been given to sensitivity, intermodulation, reciprocal mixing and spurious responses.

A serial ASCII remote interface is provided as standard to allow a multi-addressing capacity of up to 100 receivers by any one receiver. Control of the receivers may be carried out using either the RA3790 control unit, or any RA3791 or RA3792 receiver, all of which have identical front panels and controller facilities.

Alternatively they may be controlled from a suitable computer or workstations. All the standard RA3790 series receiver functions may be remotely controlled. The remote control protocol is compatible with that used in the well established RA3700 series, thereby allowing RA3790 and RA3700 series receivers to be used together in the same system.

As an option the RA3796 may be fitted with an Ethernet Local Area Network interface complying with IEEE 802.3 and operating the TCP/IP network protocol. This interface is specified and is readily available for most computers. It permits cheap, simple cabling and has a high bandwidth (10Mbps) with a multiple access topology.

In addition to the remote control interfaces, the RA3796, in common with all the RA3790 series receivers, has an independent local control bus. This serial interface allows any RA3790 series unit with an operator's front panel to monitor or control each receiver in the RA3796 attached to the local bus.

RACAL RADIO
**Technical Specification**

**Frequency range**: 10 kHz to 30 MHz in 1 kHz steps.

**Modulation**
- AM: A1A
- FM: A1A
- FSK: F1B
- USB/LSB: ICA, ICB, IVE
- RAO: IVA, IVC, RSE

**Option**
- IEB: BNE, BNE, BNW

**BFO**
- Tunable with a 40 Hz. in 10 Hz steps.

**Channel store**
- 150 frequencies in non-salable EEPROM memory with annotated mode, bandwidth, AGC and IBO settings. Blank memory is possible by remote control.

**Scan modes**
- Channel scan between designated channels with selected dwell time on each channel (0.1 s to 8.99 s).

**Frequency sweep**
- Sweep over a range of channels defined by the user. Scan ranges or frequencies may be programmed. Step size 10 kHz to 9999 kHz. Sweep rate 10 kHz to 9999.9 kHz/Hz. Further mode scanning may be fasted on detection of a signal above a programmable threshold.

**Frequency stability**
- One of the following optional frequency standards may be selected.
  1. TCXO ±7 parts in 10^6 over the range -30°C to +55°C.
  2. Ovened oscillator ±1 part in 10^6 over the range -30°C to +55°C.
  3. Aging ±20 parts in 10^6 per day after 24 hours continuous operation.
  4. High stability ovened oscillator ±0.2 parts in 10^6 over the range -10°C to +55°C.
  5. Aging ±0.4 parts in 10^6 per day after 30 days continuous operation.

**Sensitivity**
- For the frequency range 0.5 to 50 MHz:
  - S1/2/2A: Signal-to-Noise Ratio (S/N) ERB=1% at 0.05 kHz bandwidth at 0.25 dB/sensitivity.
  - S1/2/1: IF amplifier on, 10 dB (1.38 μV) IF amplifier off.
  - S1/2/0: IF amplifier off.

**Selectivity**
- The receiver has digital filters with the following bandwidths:
  - LSB: 2 kHz (0.3 kHz to 3 kHz).
  - USB: 2 kHz (0.3 kHz to 3 kHz).
  - Symmetrical: 10 kHz.

**The user may programme the receiver via the remote interface to configure additional filters by entering the bandwidth required. Up to 100 different filters may be configured. Once configured, the filters are selected by filter name, via the remote interface. All filters have very low ripple and differential group delay and a bandwidth standardizing to 200 kHz.

**Reciprocal mixing**
- With a signal input of 13 mV (10 kHz ERB) in a 2.7 kHz bandwidth, an unwanted signal 50 Hz removed must be greater than 9 MHz (10 kHz) above the wanted signal input in order to give a noise level equal to the output produced by the wanted signal. Att.8000 removed the difference in level must be greater than 10 MHz (10 kHz).

**Out of band intermodulation products**
- With a signal input of 13 mV (10 kHz ERB) in a 2.7 kHz bandwidth, an unwanted signal 50 Hz removed must be greater than 9 MHz (10 kHz) above the wanted signal input in order to give a noise level equal to the output produced by the wanted signal. Att.8000 removed the difference in level must be greater than 10 MHz (10 kHz).

**In-band intermodulation products**
- The in-band signals of 13 mV (10 kHz ERB) in each, with 600 kHz spacing produce third order intermodulation products not greater than 15 dBm or 0.5 µV at the line output.

**Blocking**
- With a wanted signal of 55 dBm (3 mV) erl in a 2.7 kHz bandwidth, an unwanted signal 50 Hz removed must be greater than 7 MHz (10 kHz) in order to reduce the output by 30 dB.

**Cross modulation**
- With a wanted signal of 55 dBm (3 mV) erl in a 2.7 kHz bandwidth, an unwanted signal 50 Hz removed must be greater than 7 MHz (10 kHz) in order to reduce the output by 30 dB.

**External spurious responses**
- Spurious responses below 50 MHz at 100 kHz frequency offset are less than 50 dBc.

**Image and if rejection**
- The receiver will not decode if there is an input signal of 500 µV at any IF frequency.

**Antenna input**
- The input impedance is 50 ±10%.

**AFC**
- The receiver will not decode if the input signal is not at 500 kHz.

**AGC**
- An increase in input of 12 dB above 100 kHz erl produces an output change of less than 24 dB.

**Digital output options**
- The digital video interface can be programmed to provide: digital I/F output (either equal to selected if bandwidth or fixed at 11.3 kHz).

**Power supply**
- 240 V to 220 V and 200 V to 240 V AC, 47 to 63 Hz.

**Dimensions**
- Height: 175 mm (7 inches)
- Width: 450 mm (17.5 inches)
- Depth: 100 mm (3.9 inches)

**Note**: Figures in I/F are typical values.