



PARK AIR ELECTRONICS

T6R VHF RECEIVER

### Digital Multimode Receiver

### Description

#### FEATURES

**Analogue and Digital programmable modulation modes**

**AM voice with 25 kHz and 8.33 kHz channel spacing**

**AM-MSK for Mode 1 (ACARS)**

**D8PSK for Mode 2 (CSMA) and Mode 3 (TDMA)**

**Exceptional dynamic range and co-location performance**

**Compact 2U high rack mounting package**

**Class leading RF performance**

**Static and dynamic BIT**

The T6 Series represent the latest generation of Park Air ATC radios which are designed for professional applications in airport and en-route centres. The T6 Series fulfils both analogue (AM) modulation and the future digital (D8PSK) modes, which are being planned by ICAO. The T6 Series makes extensive use of advanced DSP (digital signal processing) technology to enable the transition from analogue to digital modulation modes to be made via software upgrade. Investment in radio systems is thereby protected against obsolescence as new digital modulation waveforms are introduced.

The T6R operates in the VHF aviation band and provides both 25kHz and 8.33kHz channel spacing. A 100 channel memory is incorporated for recall of pre-set frequency and operating modes in multichannel applications.

All demodulation is implemented using DSP algorithms, which provide consistent long term performance. D8PSK digital modulation waveforms require high performance demodulators to ensure reliable synchronisation and low BER (bit error rate) at low signal levels. The T6R employs specially developed algorithms allied to high performance RF circuitry to ensure optimum performance in this critical area.

Control of receiver operating parameters can be effected locally using a menu driven front panel LCD or remotely via serial ports on the rear panel. All receiver adjustments are under software control and can be accessed externally avoiding any necessity to remove covers during the operational life of the equipment. Should software updates be required to support new modulation modes in the future, these can be simply effected via a front panel diagnostic port or remotely via rear panel serial ports.

The T6R has comprehensive BIT which monitors both static (supplies etc) and dynamic (S+N/N, etc) parameters. A novel technique provides an accurate assessment of receiver sensitivity using BIT. Results can be viewed on the front panel LCD and are summarised via READY and ALARM indicators. All BIT data is available for remote monitoring via the serial ports and receivers can be readily networked for remote monitoring using PAE MARC or similar systems.

The receiver is a compact 2U 19" rack mounted unit. Power can be 110/220 VAC or 24/28 VDC, with automatic switching to DC in the event of an AC failure. Both inputs are fully filtered and protected.



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## Digital Multimode Receiver | Specification

**General Characteristics****Frequency range:**

117.975 to 136.975 MHz

**Channel spacing:**

25 KHz and 8.333 KHz

**Programmable Channels**

100

**Frequency error:**

± 1 ppm

**Modulation mode**

AM voice

AM-MSK

D8PSK Mode 2 and Mode 3

**Power supplies:**

ac: 110/120/220/240 V (± 10%),

45 to 65 Hz

&lt; 75 VA max

dc: 21.4 to 32 V &lt; 2 A

**Environmental:****Operating:** -20 to +55 degrees C**Storage:** -30 to +70 degrees C**EMC/EMI:** 89/336/EEC**Weight/Dimensions****Width:** 483 mm (19 inches)**Height:** 214/89 mm (3.5 inches)**Depth:** 419 mm (16.5 inches)**Weight:** 6kg**RF Characteristics****Sensitivity**

AM -107 dBm for 10 dB S+N/N

D8PSK -103dBm for  $1 \times 10^{-3}$  BER (without FEC)**Synchronisation Probability**

D8PSK 0.999 for -103 dBm signal

**Selectivity**

25 KHz channels

± 11 KHz for 6 dB

± 25 KHz for 80 dB

8.33 KHz channels

± 3.5 KHz for 6 dB

± 8.33 KHz for 70 dB

**Spurious signal suppression**

&lt; 2 MHz from carrier -80 dB

&gt; 2 MHz from carrier -100 dB

**Intermodulation**

&gt; 75 dB for signals &gt; 100 KHz from carrier

**Cross Modulation**

-10 dBm for signals &gt; 1% from carrier

**Modulation Characteristics (AM)****Response 25KHz channel spacing:**

300 Hz to 3.4 KHz ± 3 dB ref 1 KHz

&gt; 20 dB attenuation at 100 Hz

&gt; 30 dB attenuation at 5 KHz

**Response 8.33KHz channel spacing:**

350 Hz to 2.5KHz ± 3 dB ref 1 KHz

&gt; 20 dB attenuation at 100 Hz

&gt; 25 dB attenuation at 5 KHz

**Distortion:**

&lt; 5% THD at 80% modulation

**AGC:**

&lt; 3 dB change in audio output for RF signals between -

107 dBm and +10 dBm

&lt; 1 dB change in audio output for modulation depth

change between 30% and 90%

**Mute:**

Noise compensated, range &lt; 6 to &gt; 16 dB S+N/N

**Audio outputs**

600 ohm balanced line adjustable -20 dBm

to +10 dBm

Front panel loudspeaker 1 W nominal

**Front Panel Facilities:**

A rotary encoder and back lit 4-line LCD provide simple menu driven control of all receiver operating parameters and BIT functions

LED indicators for standby, ready, alarm and receive

Combined headphone and diagnostic port connector

Recessed co-axial connector for monitoring internal reference oscillator

Loudspeaker

**Rear Panel Facilities:****Antenna:** N-type female connector**Supply connectors**

ac and dc supply connectors with associated fuses

**Facilities connector**

15-way D-type includes audio, control, and BIT connections

**Data connector**

25-way D-type used to link receiver to control computer when operating in digital modes. Provides two RS422 synchronous HDLC interfaces for status/ control and transmission data plus real time data and timing for TDMA. Message protocol and packet structures conform to ICAO/VDL SARPS requirements.

**MARC connector**

9-way D-type provides independent connection of audio/serial control data to MARC remote control and monitoring systems.



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