

# RAT7000B/RAT1000C

## Antenna Tuner

HF TACTICAL  
SUPPORT



### **RAT7000B** 125W Automatic Antenna Tuner

The RAT7000B is a 125W HF automatic antenna tuner specifically designed to interface with Datron's RT7000 and PRC1099A HF transceivers to tune whip and long-wire antennas. The tuner is designed for operation under the severe environmental conditions that can be encountered in mobile usage. It is contained in a rugged, metal case which is immersible and can be mounted in any attitude, but should be located as close as possible to the radiating portion of the antenna for maximum system efficiency. The tuner comes with a set of brackets for convenient mounting to any surface in any orientation. An optional shock mount is available for the RAT7000B.

A 100 channel memory is standard in the tuner in order to permit scanning, ALE, and other silent tune applications. After each channel has been initially tuned, the tuner "remembers" the settings for that particular channel and automatically reverts to them each time that channel is selected. Channel tuning time in memory mode is less than 10 ms.

The RAT7000B is designed to interface to the RT7000 or PRC1099A radios via a RS485 serial port. This bi-directional port provides 9600 baud communications with the radio enabling rapid selection of previously tuned channels from the tuner memory. The tuner can also be used with other HF/SSB transceivers provided a suitable RF and control interface is provided.

The tuner is designed primarily for use with end-fed, unbalanced antennas (whips and long wires). It will effectively tune almost any antenna of this type within the specified frequency range provided a good ground system is used with the antenna.

The RAT7000B can be installed in a specific location and left there indefinitely. It will provide continuous, reliable operation without requiring periodic maintenance of any kind. It requires no adjustment during setup and needs no re-alignment over time.

- Automatic antenna tuning
- 125W RF power handling
- 100 Channel memory for rapid tuning – ALE and silent tuning applications
- MIL-STD-810 for environmental performance
- Tunes whips and long wire antennas
- Control Interface to RT7000 & PRC1099A transceivers



- **Completely automatic antenna tuning**
- **100 Channel memory - ALE and silent tuning applications**
- **1 kW RF power rating (designed for use in data systems)**
- **MIL-STD-810 for environmental performance**
- **Tunes whips and long wire antennas**
- **Control interface to RT7000 transceiver**
- **Waterproof**

## **RAT1000C 1000W Antenna Tuner**

The RAT1000C is a 1kW automatic antenna tuner developed to interface directly with Datron's RT7000 HF transceiver and also can be used with any HF transceiver having an appropriate RF power output and control interface. The RAT1000C is designed to automatically match the 50 ohm output of the transmitting system to a wide variety of end-fed unbalanced antennas such as whips and long wires. The tuner can provide tactical security by permitting remote location of the antenna up to 200 meters from the associated transmitter.

A control interface specific to the Datron RT7000 transceiver is resident inside the RAT1000C. Upon initial tune, the antenna VSWR is monitored, and if it is outside a preset limit, the tuner will automatically initiate a tune cycle. Matching is accomplished and controlled by the intelligent tuning algorithm, which automatically arrives at the optimum tuner element setting for any specific antenna load impedance. The RAT1000C will tune almost any end-fed antenna within the specified frequency range provided an effective ground system is employed.

The RAT1000C is designed for continuous operation under severe environmental conditions. It is housed in a rugged, waterproof metal case that should be mounted as close as possible to the radiating part of the antenna. Optional shock mounts may be used to mount the tuner to any convenient surface in a vehicle, on a ship, or in a base station configuration.

In addition to the first-time automatic tuning mode, the RAT1000C has a built-in 100-channel memory that allows "silent tuning" and permits a retune mode whereby the tuning elements are automatically repositioned to a predetermined condition in less than 20 msec. This "retune" mode is utilized when the associated radio system is operating in an ALE mode.

## RAT 7000B

### GENERAL

- **RF POWER INPUT** 125W, PEP or average
- **DUTY CYCLE** All modes including data operation, within constraints of internal temperature (see temperature spec)
- **FREQUENCY RANGE** 2 to 30 MHz
- **TUNING RANGE** whips and wires with minimum specified length  
10 foot whip: 2.5 - 30 MHz  
16 foot whip: 2 - 30 MHz  
32 foot whip: 1.6 - 30 MHz  
75 to 150 foot long wires: 2 - 30 MHz  
NOTE: effective tuning depends on setting up a good ground system in conjunction with the antenna
- **RF TUNE POWER** 10W
- **TUNE TIME** 3 - 5 s, initial tune (typical)  
10 ms, memory tune (typical)
- **INPUT IMPEDANCE** 50 Ohms
- **POWER REQUIREMENTS** 12Vdc, 1.8A, max
- **MEMORY CHANNELS** 100
- **TUNING ACCURACY** 1.5:1 VSWR (typical)
- **CONTINUOUS DUTY OPERATION (FSK)** The minimum antenna lengths stated here must be adhered to:  
75ft (2-30 MHz)  
32ft (3-30 MHz)  
16ft (5-30 MHz)  
10ft (7-30 MHz)
- **CONTROL INTERFACE** RT7000-series and PRC1099A

### MECHANICAL, ENVIRONMENTAL

- **SIZE** 5.25" x 13" x 16" (13.3 cm x 33 cm x 40.6 cm); (H x W x D)
- **WEIGHT** 13.8 lbs, (6.27 kg)
- **CONSTRUCTION** sealed metal case, MIL connectors;
- **TEMPERATURE (OPERATING)** -30 to +60 degrees C (ambient inside case)  
NOTE: this temperature can easily be exceeded if the case is exposed to direct sunlight. For FSK operation, it is important that the tuner is installed so that the case is not exposed to direct sunlight.
- **SHOCK, VIBRATION** MIL-STD-810 (with shock mount)
- **IMMERSION** Waterproof; immersion to 3 feet

### CONTROLS AND INDICATORS

- **CONNECTORS** MIL connectors: RF input, control input, RF output; grounding lug





HF TACTICAL  
SUPPORT

# RAT7000B/RAT1000C

## Antenna Tuner



### Datron World Communications, Inc.

3030 Enterprise Ct.  
Vista, CA, USA 92081

**Tel:** +1-760-597-1500

**Fax:** +1-760-597-1510

**E-mail:** [sales@dtwc.com](mailto:sales@dtwc.com)

**Web:** <http://www.dtwc.com>

### RAT1000C

#### GENERAL

- RF POWER INPUT
- DUTY CYCLE

1000W, PEP or Average

All modes including data operation, within constraints of internal temperature (see temperature spec)

- FREQUENCY RANGE
- TUNING RANGE VERSUS ANTENNA TYPE

2 to 30 MHz

16 foot whip: 3 - 30 MHz

32 foot whip: 2 - 30 MHz

75 to 150 foot long wires: 2 - 30 MHz

NOTE: effective tuning depends on setting up a good ground system in conjunction with the antenna

- RF TUNE POWER FROM ASSOCIATED TRANSCEIVER

10W

- TUNE TIME

3 - 5 s, first tune (typical)  
< 20 ms, memory tune

- INPUT IMPEDANCE

50 Ohms

- INPUT POWER REQUIREMENTS

28Vdc, 4A peak, 1.8A, average

- TUNING ACCURACY

1.5:1 VSWR, typical

- MEMORY CHANNELS

100

#### MECHANICAL, ENVIRONMENTAL

- SIZE

11.8" x 13.4" x 19.3" (30 cm x 34 cm x 49 cm);  
(H x W x D)

- WEIGHT

48 lbs (22 kg)

- TEMPERATURE (OPERATING)

-30 to +55 degrees C. (ambient inside case)  
NOTE: this temperature can easily be exceeded if the case is exposed to direct sunlight. For FSK operation, it is important that the tuner is installed so that the case is not exposed to direct sunlight.

- SHOCK, VIBRATION

MIL-STD-810 (with shock mount)

- IMMERSION

Waterproof; immersion to 3 feet

- HUMIDITY, FUNGUS, SAND & DUST, SALT, FOG

MIL-STD-810

#### CONTROLS AND INDICATORS

- CONNECTORS

RF input, control input, RF output, grounding lug

\* Subject to export regulations

Specifications subject to change without notice - rev 0209

Datron is an ISO 90012000 Certified Company



[www.dtwc.com](http://www.dtwc.com)