

RAT7000B/RAT1000C

HF TACTICAL
SUPPORT



HF Antenna Tuners



RAT7000B 125W 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.

Features

- 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



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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.



Features

- 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

RAT7000B/RAT1000C

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HF Antenna Tuners

RAT7000B Specifications

GENERAL

- RF POWER INPUT 125W PEP
- 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)
20 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





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HF Antenna Tuners

RAT1000C Specifications

GENERAL

- RF POWER INPUT 1000W, 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 VERSUS ANTENNA TYPE
 - 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 TRANSCIEVER 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



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