

HAMTRONICS® REP-200N REPEATER: INSTALLATION AND OPERATION

GENERAL.

The REP-200N Repeater is a version of the popular REP-200 Repeater supplied without a control board or front panel controls and indicators which are a part of the controller. It allows the rf portions of the REP-200 to be used with other controllers.

PARTS SUPPLIED.

The REP-200N is the same as the full-blown REP-200, except as follows.

- The COR-5 control board is not supplied.
- 15 4-40 x $\frac{1}{4}$ " pan head screws are supplied to fasten the cover in addition to the 3 we install just for shipping.

CONNECTIONS.

Normal connections for the B+, audio, and control signals to/from the receiver and transmitter compartments are terminated at the feedthrough capacitors which extend through the compartment shields, allowing external connections to the controller to be made by soldering wire leads to the feedthrough capacitors. These wires can then be routed through the bushing in the rear panel for attachment to the controller.

Receiver (front to rear):

B+ should be +13.6Vdc at 35-150 mA, depending on volume control setting.

COS is about +6Vdc when squelch is open and 0V when squelch is closed. It is a logic level, not intended to supply much current. You can drive a load of about 50KΩ or higher, which is sufficient to turn on a transistor, etc. at the input of your controller.

AF is audio from the input of the volume control in the receiver. It is squelched audio of about 100mV p-p used for the receiver input of your controller. It is at a high impedance (100K volume control).

SPKR is the output of the receiver, with adjustable volume, to drive an external monitor speaker. You could use this to provide audio to your controller instead if you don't mind setting the level with the volume control. The disadvantages of doing so are that you normally cannot also use it for a monitor speaker and if you accidentally change the volume control setting, you disturb the repeater transmit deviation.

Transmitter (right to left):

B+ KEYED is +13.6Vdc switched by your controller to provide power for the exciter when it is to transmit. Usually requires a 1 Amp power transistor in the controller to switch the B+. If your controller doesn't provide this but only a ground to key something like a transceiver, you need to use that ground to drive either a power transistor or a relay to switch B+ for this purpose. The exciter takes 500-600 mA. Make sure the voltage is regulated, as should be done for the receiver too. See schematic below.

AF is transmit audio from the controller. Input impedance of the exciter is 2000Ω. Input level required for full deviation is about 30 mV p-p.

OVEN is +13.6Vdc to power crystal oven in exciter, if used. Ovens take about 500 mA when first fired up, and as little as 25 mA when idling. Synthesized exciters do not have an oven; so this ft cap is omitted on those repeaters.

PA B+ is +13.6Vdc applied all the time. The PA operates in class-C; so it draws current only when driven by the exciter. It is not necessary to switch this B+ line. Current drain is 4-6Amp, depending on power level of PA being used. 10-15W PA's take about 4 Amp, and 25W PA's use about 6Amp max.

PRECAUTIONS.

If you have any questions...

First read all the instructions which are packed with the unit. Then, if any questions still remain, please call us for assistance. Repeaters are complex systems, which interact with power supplies, antennas, duplexers, phone lines, etc. It may take a little time and patience before you get your complete system up and running. However, once you do, it probably will operate for years with very little attention.

Cover Screws...

In order to save you time installing factory assembled repeaters, we only install a few cover screws for shipment. The other screws are supplied in a plastic

bag with the instruction manuals. Make sure you install all the cover screws before you place the repeater in operation.

Notes about Synthesized Modules. Key Up Delay...

The T301 or T304 Exciter can be keyed two ways. There are two power input pads on the pc board: E1 and E4. E1 is the main power input for the whole board. E4 is a separate input pad for just the synthesizer and modulator stages. Normally, E1 and E4 are connected by a trace on the pc board. The trace can be cut to allow E4 to be powered separately. This allows the synthesizer to run all the time and E1 can be keyed when necessary by the COR board.

Our normal method of building repeaters is to key both power terminals. This avoids having any low level signal get out on the antenna when the repeater is not keyed. However, it does cause about $\frac{1}{2}$ second delay when the repeater is first keyed. After that, there is no delay until you let the carrier completely drop.

If this delay on first key up is objectionable, you can split the B+ as described above. However, even though the carrier is attenuated over 100 dB, some may hear the carrier on the air all the time if they are close to the repeater.

Shielding...

It is important, with frequency synthesizers, to avoid getting even small amounts of rf from output stages of a transmitter back into the vco or synthesizer chip. Such unwanted feedback can prevent the synthesizer from properly locking and may result in spurious signals. In the repeater, the pa is in a separate shielded compartment, but we have seen cases where rf from the output stage of the exciter (it has a nice little heatsink antenna!) gets back into the synthesizer and causes it to unlock.



