

ID-O-Matic Interface to a stock GE Mastr II Repeater

An ID-O-Matic can be added to the standard GE 19A129924G1 Repeater Audio Board to give ID and courtesy tone capability to a base station repeater. The ID board is mounted on the metal front panel of the audio board using the 9 pin serial connector used to set the parameters on the ID-O-Matic, and this will allow changing the settings while the repeater is in service.

A pin connector is added to the ID-O-Matic board during construction to allow a mating connector to be wired with the connections to the repeater audio board. This will allow servicing the audio board by removing the ID-O-Matic board connector since no modifications are made to the stock board save adding the connections to the indicated points.

Power and audio out connections are also made using pin connectors. The level of the ID is controlled by selection of the value of the 15 K resistor used to interface into the repeater audio circuit. The ID tone frequency can be set to 1200 to 1700 Hz to allow the low pass characteristics of the repeater to filter off the harmonics of the square wave ID. Setting the level to 1 kHz deviation or lower will keep the ID from being too intrusive to the user.

Setting the courtesy tone to 400 to 700 Hz will give a more audible tone. One dot length time appears to be about right for the courtesy tone duration, but this can be changed as desired.

Both the Start and Inhibit inputs are used on the ID-O-Matic so that the first ID will be delayed until the first release of the user input. Otherwise the ID will occur 10 seconds after the first actuation of the Start input. Adding the Inhibit will hold off the ID until the user unkeys.

Repeater mode of the ID-O-Matic:

In this mode of operation, the START input is used to indicate that the transmitter has been keyed. It is normally connected to a receiver COR/COS output, or in this case the RUSOS which is a negative going indication that a receive signal is active and a valid CTCSS is being received. When the RUSOS input first goes low (active), the ID timer is loaded with your specified ID interval and starts counting down. At this time the LED will begin flashing green. When the ID timer reaches 5 seconds till ID, the LED goes to solid yellow. The LED then goes solid red and the ID message is sent. The yellow time is configurable using the setup menu.

The LED normally mounted on the ID-O-Matic board can be relocated to the front panel of the Repeater Audio Board by adding wires to the LED leads. This will allow viewing of the ID status when the RF panel is folded down.

If your ID interval is set to 9.5 minutes and the repeater has been idle for more than 9.5 minutes since the last ID, an ID will be sent 10 seconds after the first time RUSOS goes active. The ID timer is then reset with the normal ID interval. During this phase, a polite ID is used. The ID message will not be sent until RUSOS is released OR the normal ID interval is reached. The INHIBIT Line is used to hold off the ID until the repeater is not busy. As long as INHIBIT is held low, the ID message or beacon message will not be sent. As soon as it is released, any pending message will be sent.

If a ground is applied to the TEST input (Pin 1) to the ID-O-Matic while in the repeater mode, the alternate ID will be sent. This is useful for indicating the repeater is operating on emergency power and the ID can be programmed to show the new operating condition. The alternate ID will continue as long as Pin 1 is held to 0 Volts.

The PTT output is always active when the ID or beacon message is being sent.

It is also active:

- If PTT hang time is set (not zero), the entire time RUS is active plus the length of the PTT hang time setting;
- If a courtesy beep is set, the entire time RUS is active plus half a second and the length of the beep;
- If both are set, the entire time RUS is active, plus the courtesy beep and hang time delays.

Modifying the Repeater Audio Card

The ID-O-Matic is mounted to the front panel of the repeater audio card as shown in Panel.pdf and ConnectorLED.pdf. The LED is also mounted on the front panel.

The panel mounted on the audio card is shown in Mounting.pdf. Note that clearance should be provided to keep the filter board from interfering with the ID-O-Matic card.

The connections to the repeater audio card are shown in Feedthru.pdf. The schematic is shown in the Mastr_II_ID_O_Matic.pdf file. Note that all the connections are to feedthrough points on the board. Trace the points back from the edge card connector and draw a circle around each one to prevent errors in adding the connecting wires and components. The diode is mounted with the cathode (band) toward the board.

The final assembly is shown in Final.pdf.

Mastr II Preparation

The repeater should be set up and operating with the stock repeater controller and repeater audio cards before installing the ID-O-Matic. If you are using the standard GE CTCSS board, you should connect jumper 1 to 2 on the 10 Volt Regulator. Jumper 1 to 3 should be removed, and if your card has a place for jumper 16 to 17 it should also be removed.

Jumpers H-41 to H-42 and H-69 to H-68 on the Radio Front Panel system board should be removed.

Turn the control for the repeater timeout to maximum and turn the tail delay control to minimum on the repeater control card.

ID-O-Matic Parameters

Here are the settings I use on my installation:

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ID time (550):

Yellow time (5):

Blink time (0):

SPACE will delete ID string.

ID Msg (N5SN/R):

Beacon Msg (DE N5SN/R RUI):

Alternate Msg (N5SN/R EMR PWR):

Auto CW ID (Y):

CW Speed (20):

ID audio tone (1524):

Repeater mode (Y):

Courtesy beep tone (753):

Courtesy beep delay time (4):

Courtesy beep mult (1):

Beacon time (5000):

PTT hang time (2):

PTT max time (2400):

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Operation

The LED on the ID-O-Matic should be green at rest. After the first key-up, it should flash green for 5 seconds and then turn yellow for five seconds before turning red. At this time the transmitter will key and then the LED returns to yellow for the duration of the ID. After an additional key-up after the initial ID, the LED will flash green until five seconds before the ID interval and then will turn yellow. After five seconds of yellow the LED will turn red for the final ID. I chose to set the LED flash to 0 to avoid confusion as to when it has a pending ID or it is showing the 5 second warning till the ID. These parameters can be configured to the operator's taste.