

Advanced Repeater Systems Audio Delay Board Installation Instructions

Overview

The ARS Audio Delay board is a Repeater Station Squelch-Tail Eliminator (STE). By delaying the receive audio, the Audio Delay board mutes the squelch tail (noise burst) prior to being sent to the repeater transmitter. This results in clean, natural audio without squelch-tails or noise bursts.

The Audio Delay board contains a high-performance, low-noise, integrated circuit, which converts audio to digital, digitally delays the signal between 50 to 250 mS, and then converts the signal back to analog which is switched by an analog mux. The delay time and audio level are set with potentiometers. The audio is gated by either an active-high or active-low COS or CTCSS signal from the repeater receiver.

Features & Specifications

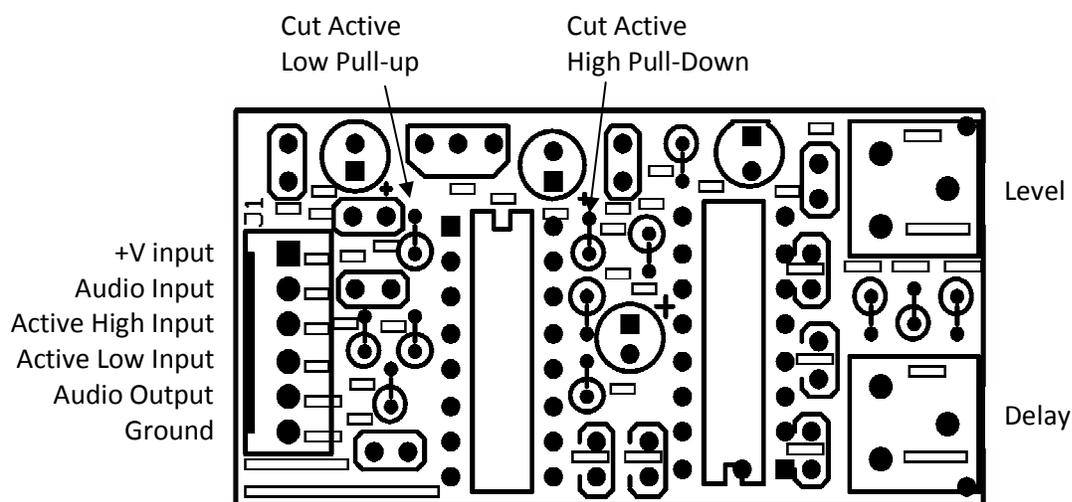
- Small Size 1.12" x 2.2" (29mm x 56mm)
- Low Power: 360mW (30mA at 12 Vdc)
- High Audio Input Impedance (~10k Ω)
- Low Audio Output Impedance (~300 Ω)
- Dual on-board Audio Gates for High Isolation
- Active High or Active Low Audio Gate Control (~100k Ω)
- Adjustable Audio Level (0 - 4Vp-p Output)
- Adjustable Delay from 50 to 250 mS
- Easy Installation with Double-Faced Tape

Installation

The ARS Audio Delay board is completely assembled, tested and ready for installation. The interface is through solder pads or a 6-pin, low-profile, male connector which can be directly solder to or mated with the supplied female connector and pins. To assist installation; I/O's are labeled on the topside of the board.

1. Identify squelch control signal. This is a signal that changes with incoming signals and is generally found in the receiver squelch circuitry. The signal can either be an active high or active low. An active high is a signal that goes from a low state (less than 0.5 volt) to a high state (greater than 2.5 volts) when the receiver is un-squelched. An active low is the reverse condition. Note: In rare cases some control signals may not work with the internal pull-up and pull-down provided on the Audio Delay board. Refer to the board drawing for the location of these resistors. Cut and separate the top lead of the resistor for the signal (active low or high) pull up or down resistor (Cut only the resistor applicable to your signal).
2. Identify a low-level receiver audio path to cut. This can be a location where receive audio is routed at a low-level to the repeater audio gate or where it is routed to the repeater controller (but not prior to the squelch circuit!). The delayed audio output can be re-inserted after this "cut."
3. Identify a location to install the Audio Delay board either in the repeater receiver audio section or with the repeater controller and that all signals are within reach of the proposed location.
4. The Audio Delay board either has direct solder pads or a 6-pin low profile male connector and a mating female connector with pins. Interface wires can be soldered directly to the male connector pins if desired. Caution: Static discharge can damage the Audio Delay. Use Proper Static Control Procedures. Make sure your work surface and soldering tip are grounded.
5. Turn the repeater power OFF.
6. Solder to following to the board connector or female connector pins:
 - a) Audio Delay Ground to the receiver audio circuit ground.

- b) Audio Delay Power Input to the receiver 8 – 15 volt supply.
 - c) Audio Input from a low-level receiver audio source.
 - d) Audio Output to a point after the above source that feeds audio to the controller or transmitter.
 - e) Audio Gate Control: use either the Active High or Active Low input depending on your COS or CTCSS signal. You only need one of these, leave the unused pin open.
 - f) Double check wiring and power polarity (reverse polarity can damage the Audio Delay).
7. Mount the board with the supplied double-faced tape, preferably with the component side up.
 8. Turn ON the repeater power; verify that the green power LED on the Audio Delay is lit.
 9. Key-up an input signal, the repeat audio level should be clean and undistorted. Set the **Level** potentiometer for unity gain through the repeater. Note: If the repeat audio sounds distorted, the Audio Delay board may be overdriven- reduce the **Level** setting. An oscilloscope is helpful in setting the audio level and troubleshooting distortion. It may be necessary to balance the audio level between the Audio Delay and the input to the repeater audio gate or controller.
 10. Set the **Delay** potentiometer for just enough audio delay to eliminate the receiver's squelch tail (too much delay may clip the end of a receive signal).
 11. Installation complete- enjoy the clean and pleasant sound of your repeater!



Note regarding fast squelch circuits: Some repeaters have automatic fast/slow squelch circuits where a strong signal has a fast squelch resulting in an audible “click” which is eliminated by a minimal to nominal delay. Conversely a weak signal produces a long squelch tail which requires a long delay to eliminate. However, adjusting the audio delay to eliminate a long squelch tail can clip the end of a strong signal. This condition can be avoided by defeating the fast squelch circuit or by reducing the slow squelch time constant. Another option is to set a nominal delay which will mute the more frequent fast squelch tails and *most* weak signal squelch tails.

If you need assistance or have questions about the installation of the Audio Delay, please contact us at: Info@ARSrepeaters.com or call 727.452.4200.

The ARS Audio Delay has a one year warranty against defects. This warranty excludes damage caused by improper installation, reverse polarity, shorting the board to ground, power surges, lightning, etc.

The ARS Audio Delay has been thoroughly tested and is an extremely reliable product. If your Audio Delay fails to operate, please contact ARS prior to returning the board. It shall be at the sole discretion of ARS to repair or replace a defective or damaged unit.