WB4IVB - Arcom 210 Repeater Controller with the Yaesu Fusion DR-1X Repeater

I recently installed an Arcom 210 Repeater Controller with the Yaesu Fusion DR-1X Repeater. Adding an external controller to the DR-1X offers capabilities that the stock internal controller does not support.

Discriminator Audio from the DB15 connector on the DR-1X is un-filtered. This audio is ideal for feeding to a controller receiver audio input but some filtering of low frequency audio is necessary. I used the Arcom ADR interface which employs a Communications Specialist TS-64-DS Encoder/Decoder, but I was disappointed in the decoder portion of the TS-64-DS to provide adequate filtering of the received CTCSS from a repeater users radio. The presence of a CTCSS signal beyond the decoder circuit of a receiver is just an annoyance and can distort voice audio.

Dick, WB2JPQ, has used CTCSS Filters for many years on his equipment with good success, so I decided to install one inside the Arcom.

I chose to use a General Electric Channel Guard Filter Board which was used in GE Mastr II stations. The GE Part Number is 19C3206271. By the way Channel Guard is just a trademark name of GE for CTCSS. Motorola Micor filtering is done within the CTCSS Decoder that plugs into the Audio/Squelch Board. The Micor Mobile and Station used the board. The Motorola trademark name being Private Line (PL). Or, if you prefer to dig really deep in an old commercial two-way junk box you may use an RCA CTCSS Filter. The RCA trademark name being "Quiet Channel". All boards are High Pass Filters designed to attenuate low frequency audio in the CTCSS frequency range (67-250 Hz).

The GE Filter Board has two Molex connectors which were designed to plug-in to the station Audio Board. These Filter Boards were also using in GE Auxiliary Receivers. Same GE part number as the station. I removed the two Molex connectors and soldered wires directly to the board. The idea is to install the filter board in the audio path between the receiver audio and the controller receiver audio input.

Many repeater controllers including the RC210 have an Audio Delay Board connection header. This is an excellent place to connect the Filter Board. If you are not using an Audio Delay Board with your controller, simply connect the Filter Board Input to Discriminator Audio, Filter Board Output to Repeat Audio, and +12 Volts and Ground. Of course if there is no Delay Board

installed on the controller there will be a Jumper in place to connect Disc Audio to Repeat Audio. This Jumper is removed, and the Filter Board is connected. Although there are no adjustments on the filter board, I recommend that you do check the levels before and after installing the board and adjust if necessary.

If you are using an Audio Delay Board you want to connect the Filter Board Input to Receiver Discriminator Audio and the Filter Board Output to "Audio Input" of the Delay Board. Then make the necessary connections for +12 volts and ground. This ensures that the CTCSS is filtered before entering the audio delay circuitry.

On the Arcom RC210 Controller, the Port One Audio Delay Header is JP10. Pin1 +12volts, Pin2 Discriminator Audio, Pin3 Repeat Audio, Pin4 Ground. COS remains on Pin5. Again, if you do not have an Audio Board installed you will find a Jumper from Pin2 to Pin3 which completes the audio path in the absence of an Audio Delay Board.

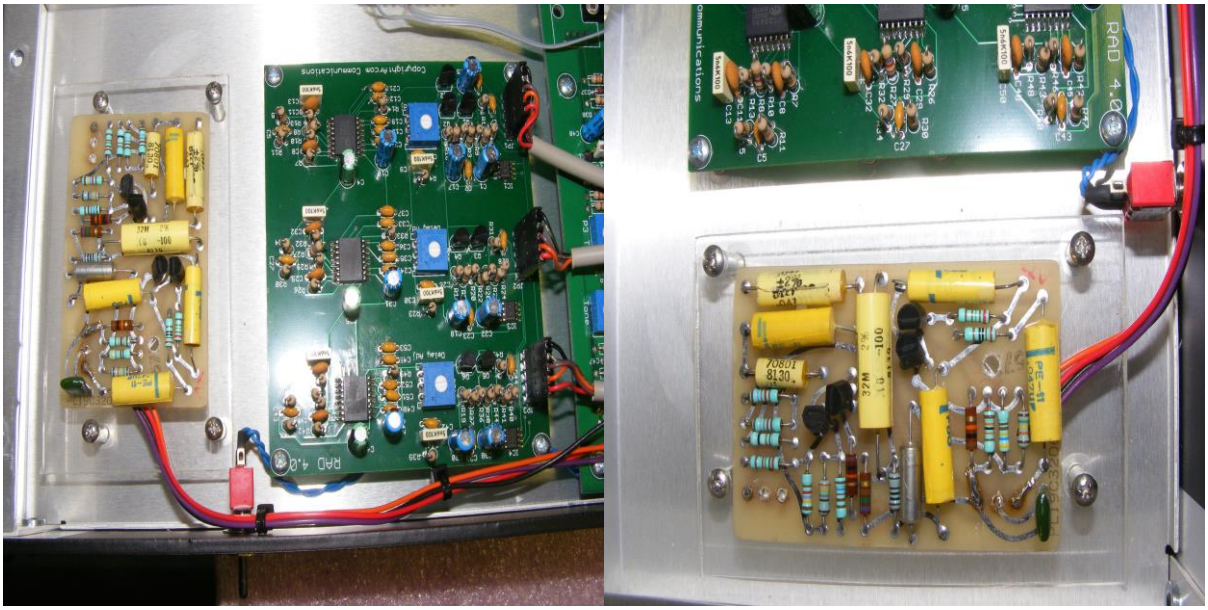
I used a piece of 1/16" Plexaglass to mount the GE Board. I drilled four holes to match the existing mounts for an optional AutoPatch Board in the RC210 enclosure. There are two three pin Molex plugs on the GE board that I removed. One side, marked J1 Pin 1 is the Audio Input. There are two other solder pads at J1, but there are no circuit board traces connected.

The three pin Molex at J1 was used for mechanical support. The opposite side is J2. J2-1 is +10VDC (12 VDC is okay to use) J2-2 is Ground,and J2-3 is Audio Output.

I made a wiring harness and incorporated it with the Audio Delay Board so there was no direct soldering to the Controller Delay Board or the Controller Header pins. Direct soldering to the GE Filter Board is fine, but do not solder to the controller or audio delay board pins.

Molex Connectors and Pins are available from Mouser, Digi-Key, or your favorite supplier, and makes a neat appearance. If you need part numbers feel free to contact me.

The GE board, or others I mentioned, can be used with any repeater controller or any audio path where low frequency attenuation is desirable. The filter boards are relativity small and could be mounted within an IRLP computer or fit nicely in small enclosures.



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