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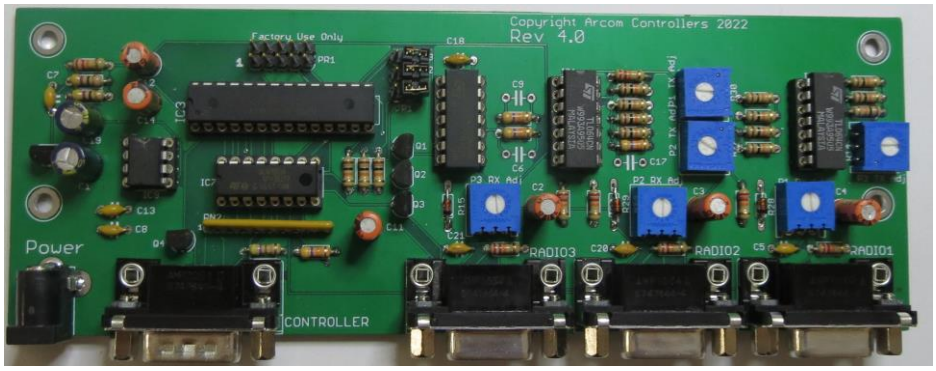

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Arcom EX1 Port Expander

June, 2022

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Introduction

The Arcom EX1 Port Expander allows you to connect up to 3 additional full-duplex/half-duplex/simplex radios to the RC210 while using only 1 Port on the RC210 itself. Each additional Port is enabled/disabled by the Logic Outputs (UF) of the RC210 and may be used individually or simultaneously.

Additionally, the EX1 may be used to link more than one RC210, effectively providing more Ports to be used any way you need (more on this later).

Polarity of each transceiver's COS signal is easily selectable by push-on jumpers on the pc board and audio levels (both RX and TX) are adjustable as well.

Power

The EX1 may be powered by a voltage source of +8 to +15 volts DC, capable of supplying 25 ma or more, through the coaxial power jack (r. Alternately, the EX1 may be powered by +5 volts on Pin 9 of Controller Connector.

A couple of important points to remember about power for the EX1

No more than +5 volts should ever be applied to Pin 9 of the Controller Connector. This will damage the EX1 and void any warranty.

If you are already using the +5 VDC output available on the RC210s I/O Connector (Pin 21) for some other purpose, it is recommended that you use an external power source of +8 to +15 VDC using the coaxial power plug provided. It is only necessary to supply with EX1 with power from one source. You should not need to (nor should you) use both methods.

Connectors

The 3 DB9 female jacks are used to connect up to 3 transceivers.

Radio1, Radio2 and Radio3 Pin connections
Pin 1 – Not used
Pin 2 – CTCSS in from radio (Active Low)
Pin 3 – PTT out to radio
Pin 4 – TX Audio out to radio
Pin 5 – RX Audio in from radio
Pin 7 – COR in from radio
Pin 6,8,9 – Ground

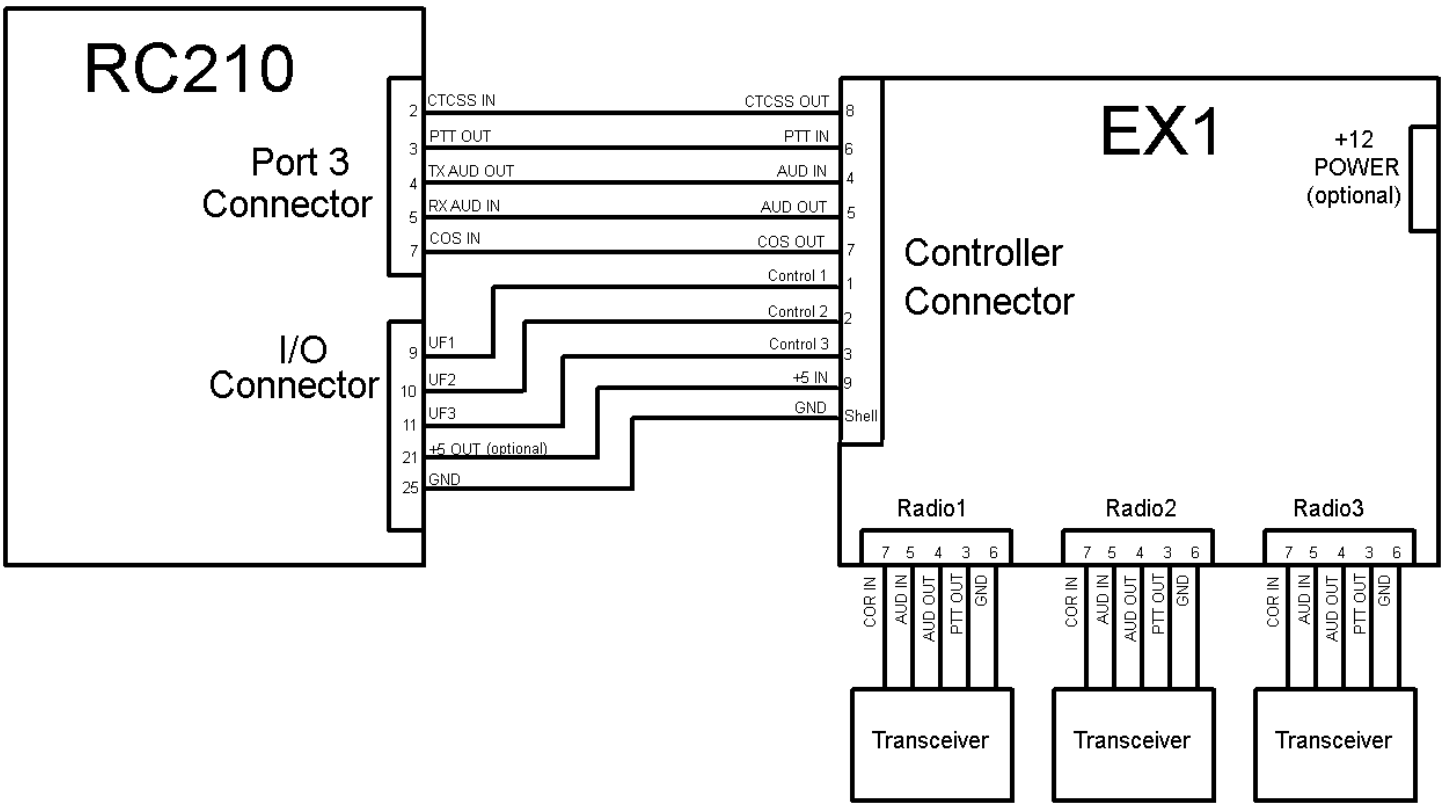
The male DB9 is used to connect the Port Expander to the RC210.

Controller Connector
Pin 1 – Radio 1 Control Line (Active Low)
Pin 2 – Radio 2 Control Line (Active Low)
Pin 3 – Radio 3 Control Line (Active Low)
Pin 4 – Audio In from controller
Pin 5 – Audio Out to controller
Pin 6 – PTT In from controller
Pin 7 – COS Out to controller (Active Low)
Pin 8 – CTCSS Out to controller (Active Low)
Pin 9 - +5 VDC In ***(Caution! NEVER apply more than +5 VDC)***
Shell – Ground

The coaxial power jack is used to provide power to the EX1 (if not powering from the RC210)

Power Connector
+8 to +15 VDC @ 18 ma. Center pin is positive (+)

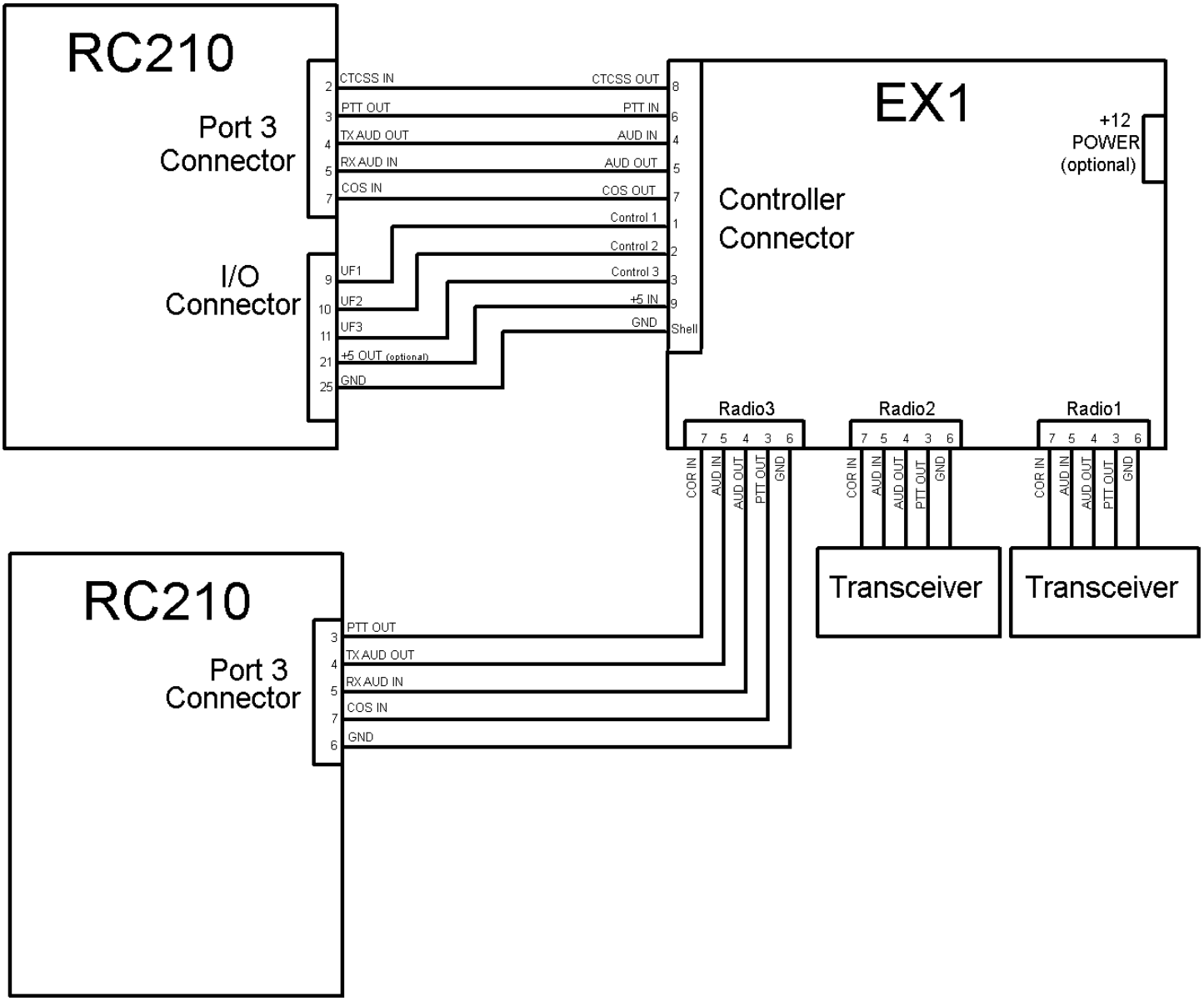
Using the EX1 to connect more than one link/remote base radio



Using the EX1 to link more than one RC210

It is possible to combine more than one RC210 using the EX1. For example, you could use two RC210s and one EX1 to provide 4 fully capable repeater Ports plus 2 remote base/link transceivers. Using such a configuration would allow all Ports to be linkable with each other and have complete access to Macros, Scheduler, Alarms, etc.

One such possible configuration is shown below



Port 3 of each RC210 should have both its COS and CTCSS Polarity Jumpers set to Active Low (Pins 1 & 2). Likewise, the EX1 should have its Port 3 COS Polarity Jumper also set to Active Low (ON).

Transceiver COS Polarity

The EX1 has selectable COS Polarity (Active High or Active Low) to accommodate any radio on the market for use as a link/remote base. Their settings are as follows:

Jumper OFF = Active High
Jumper ON = Active Low

JP1 – Radio 1
JP2 – Radio 2
JP3 – Radio 3

Note: It is recommended you keep the Jumpers across both pins on any Radio Port you're not using.

Adjustments

It is recommended that you set the Disc. And TX Audio levels on whichever RC210 Port you'll be using your EX1 with to mid-level. (Port 3 is recommended). Likewise, make sure the COS and CTCSS Polarity Jumpers on that Port are set to Active Low (jumper between Pins 1 & 2). Also, that Port should NOT be in Repeater Mode.

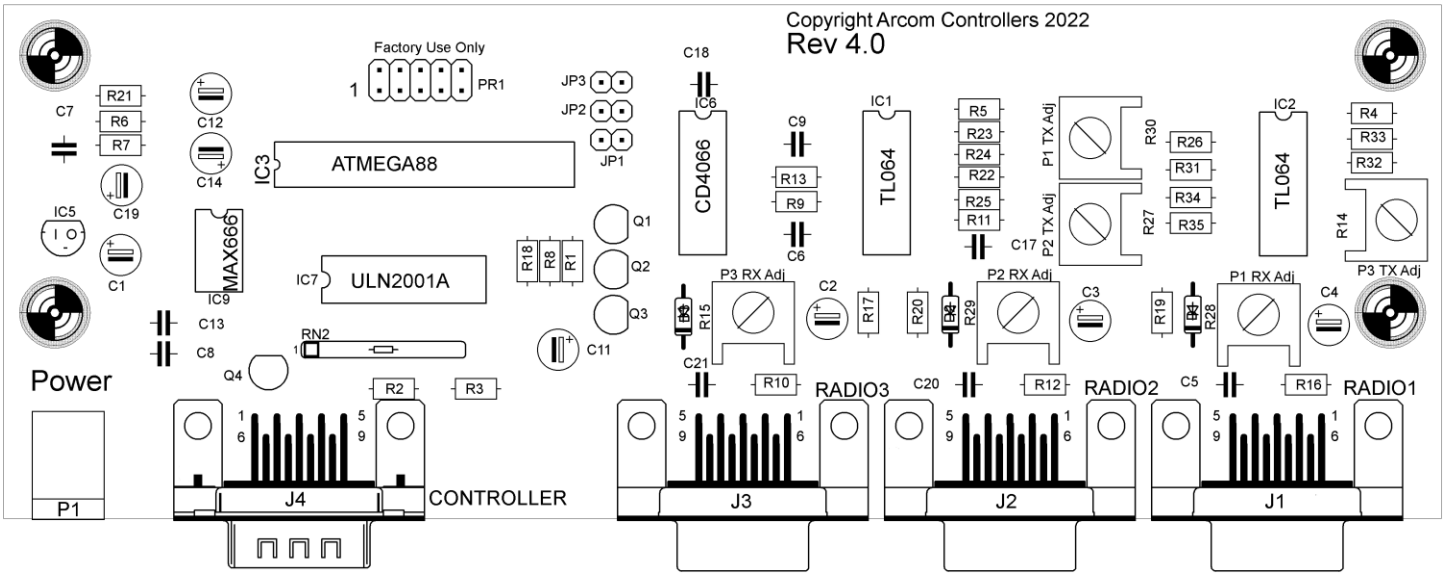
Each Radio connector on the EX1 has its own input level, as well as TX Audio trimpot. Adjust as needed for your existing system.

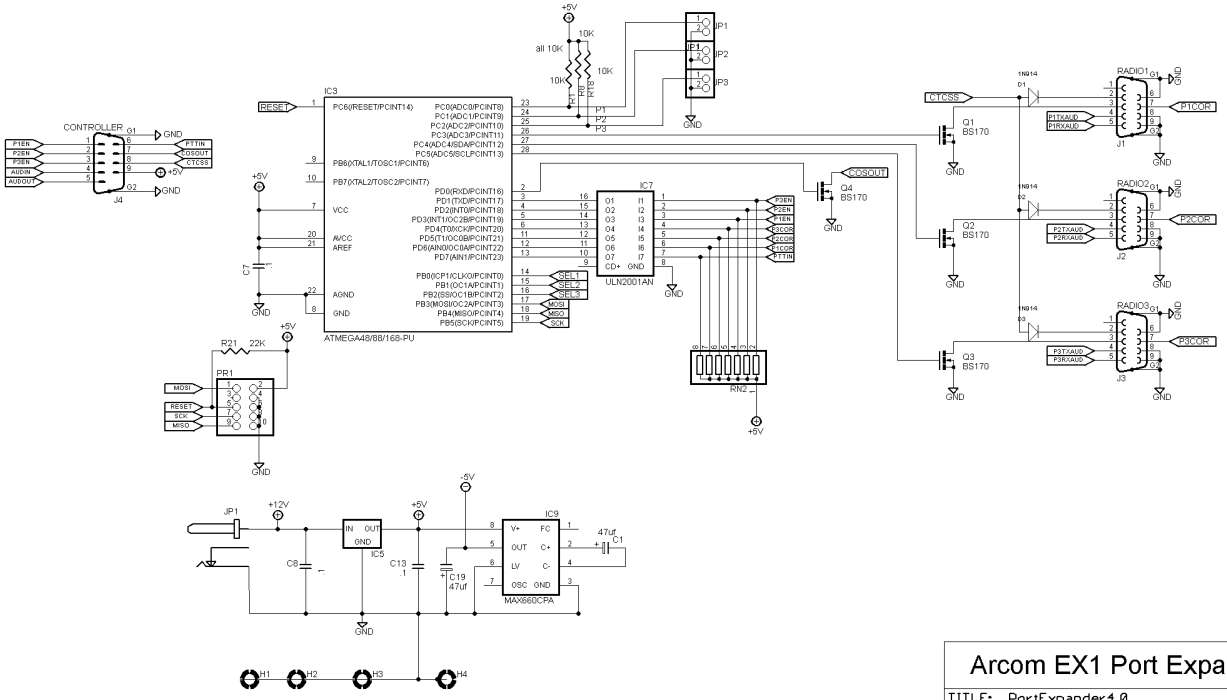
Operation

Each radio must be enabled in order to use it. This is done by pulling the associated control line to ground. Once enabled, the radio connected to that Port will have the same functionality as if it were connected directly to the RC210. You may enable all 3 simultaneously if you desire.

The easiest way to manage the EX1 is to program some Macros in the RC210 to enable and disable each Radio Port on command (using the Logic Outputs of the RC210). How to do this is explained in the RC210 Operations & Programming Manual.

By default, the EX1 expects de-emphasized audio from the connected radios. However, you can add the appropriate capacitors (Radio1 = C9, Radio2 = C6, Radio3 = C17) as needed if you choose to provide audio that is not de-emphasized in the radio (discriminator audio). Start with .002uf and tailor as you need.





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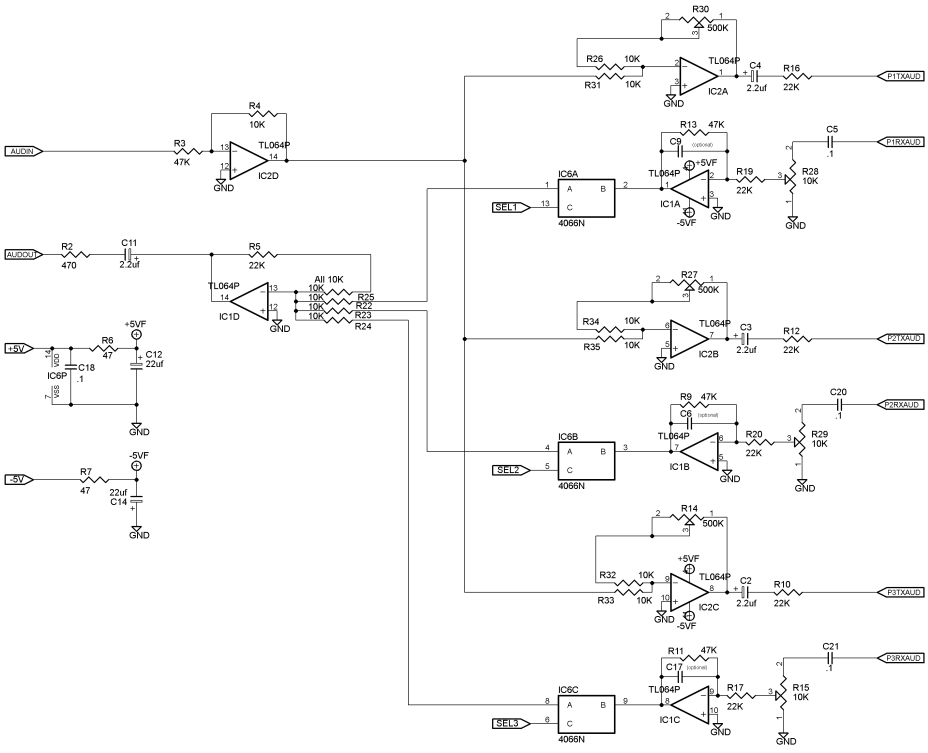

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