E&M/COR Driven Bridge Configuration for M4X Blade

A common requirement requested from customers is to bridge audio to and from various audio sources under E&M conditions. Often, many bridging applications were done using passive or active audio bridges. While these work well in some applications, they both have limitations not suitable to many of today's more advanced applications.

Passive bridges are often not even considered due to the inherent loss found. Active bridges have no loss and can be adjusted for gain or loss depending on user requirements. While active bridges fill a need that passive bridges can't, many customers are finding they need more than what an active bridge can provide. Specifically, they want bridging that only activates with E & M signaling. The most commonly requested type of E & M bridge at Raven is an *E & M conference bridge*. This means that an E-Lead or COR input received on a bridge port will activate an audio bridge or path routing the inbound audio to the output of all other ports of the bridge and asserting an M-Lead (or PTT closure) on those output ports. When the E-Lead goes away on the input port, the audio bridging will cease and the M-Lead (PTT closure) will deactivate.

The Raven M4x Blade is ideally suited for this application. The Blade can be set up in an E & M bridge using the user application software. Bridges can be set with two to eight ports in a single Blade. Higher capacity bridges can be set up by daisy-chaining two or more Blades to one another. Adjustments can be made to each port for gain, audio delays to avoid speech clipping, and relay hold on timers to keep a transmitter keyed long enough to avoid truncating the end of a transmission. Common uses for E & M bridges include:

- Simple radio interoperability where E & M keying is needed.
- Back to back repeater applications where inbound audio from one repeater is routed out another repeater with E & M.

A user configurable option on this type of bridge could include tone keying on an output port instead of an M-Lead or PTT. Configuring a COR driven bridge is simple using the Raven M4x user app software. The following steps will guide you through setting up a 3-way COR driven bridge.

To begin launch the software, connect, and from the system components menu select **"Add Bridge Group"**. Next drop and drag the ports you want in your bridge group in the box (Figure 1).
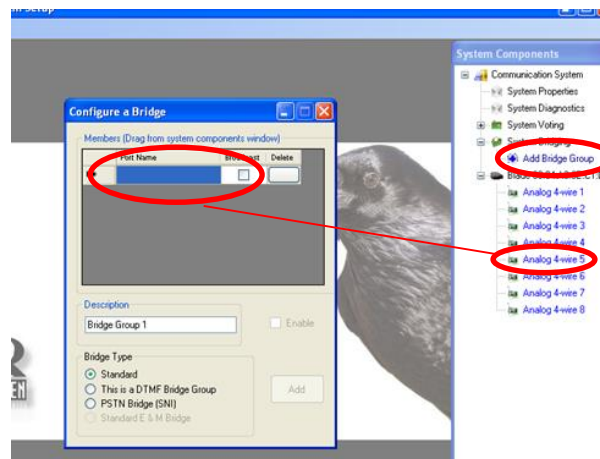

Figure 1

TECHNICAL NOTES

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After dragging the desired ports in to the **"Configure a Bridge"** box, check **"Standard E&M Bridge"**. This option will remain grayed out until you drag ports in to the box. When done, select the **"Enable"** and **"Add"** buttons. After selecting **"Add"** follow the prompts to save and then clear the bridge box from the desk top. Next bring out the port settings tabs for each of the ports in your bridge group by clicking on their icon at the right of the screen (Figure 2).
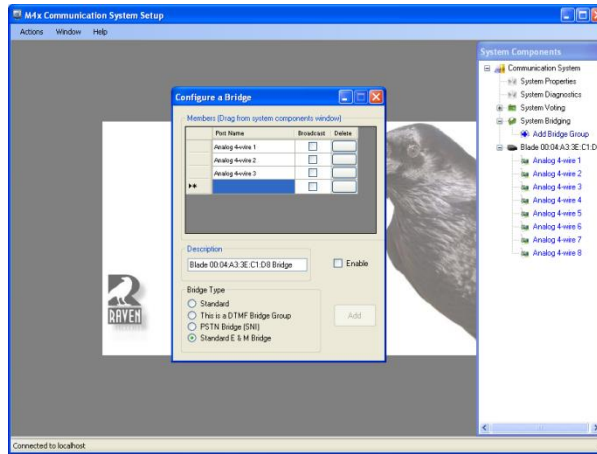

Figure 2

Clicking once on each port in your bridge group will bring the port settings tabs out to the desk top as shown in Figure 3 below. Expand a port settings tab by clicking on **"Settings"** and then select the **"Keying"** tab.
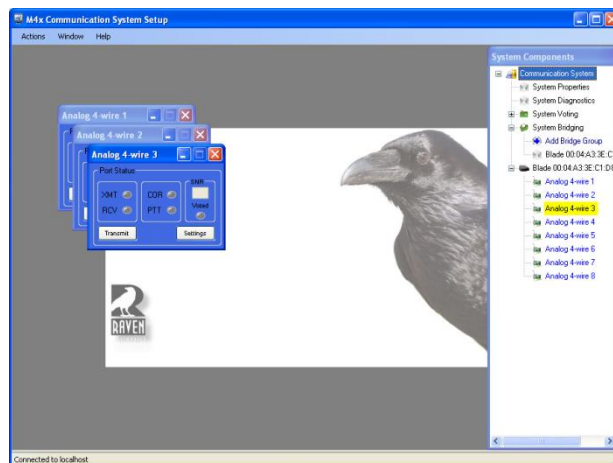

Figure 3

After selecting the **"Keying Tab"**, decide how this port will be keyed. For example, you want port 3 to assert a PTT when triggered. The trigger in this case is a COR input on port 1 or port 2. Check the box for **"PTT is asserted when the trigger is reached"** (Figure 4).

Caution! DO NOT make any changes to the **"Key-up Triggers"** menu. Any changes made will cause the bridge to not key or function properly.
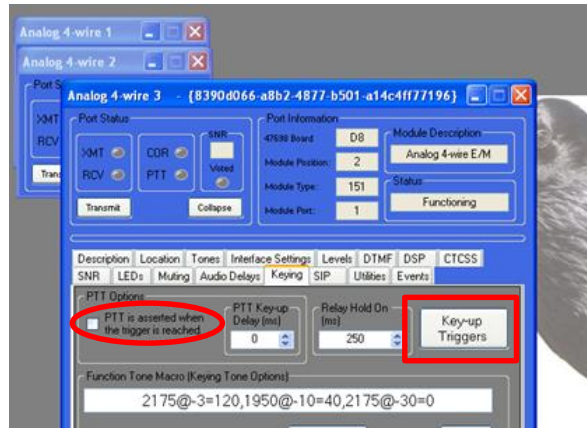

Figure 4

When done with this port, make your keying selections for your other ports. Keying does not have to be PTT. Port 2, for example, could be set to key off function tone. To select function tone, check the **"Use Keying Tones"** box at the bottom left. The default tone macro is shown above that box consisting of 2175 Hz HLGT, FT, and LLGT. To change the tone macro, click on the **"Tone Macro Help"** button (Figure 5). You do not have to issue a keying command. For example, if one of your ports is a console port it might not require relay or tone keying. In this case, do not check the **"PTT"** or **"Tone"** boxes. Note however, that a COR input is required on anther port before audio will bridge out the other ports of the bridge regardless of the type of keying selected. If you do not want the COR input condition on every port of your bridge but just of the some ports, contact Raven Tech Support for help. These types of "mixed" applications can generally be accomplished using Raven's *Synergy Action Rules* software. A limited license copy of Synergy is included with every Blade.
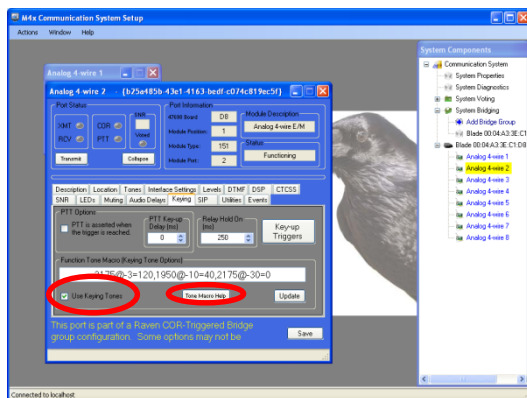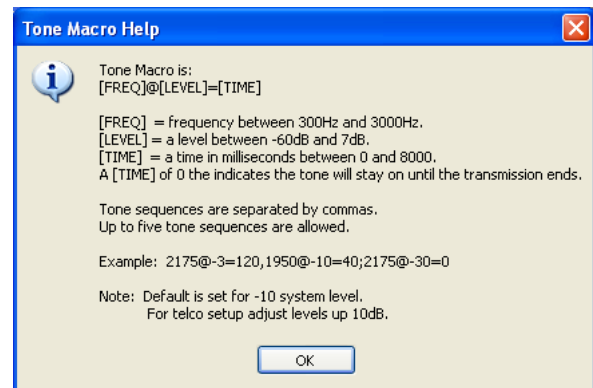

Figure 5

Figure 6