M/A-COM Mobile Radios - Interfacing External Audio Devices

These instructions apply to interfacing the Orion, Jaguar 725M and M7100 mobile radios with external devices such as encoders, decoders, remotes, crossband repeater controllers, mutual aid interoperability devices and others. The following topics will be covered:

1. Programming changes to provide for an external PTT and set the proper radio output power if necessary for the application.
2. External connections to interface the radio *PTT, TX* and *RX* audio to the external device.
3. Programming and connections for a *Carrier Operated Relay* (COR)

The radio models in Table 1 below can be adjusted within the power range shown

| Radio Name	Radio Model	RF Band MHz	Power Range in Watts (adjustable)
J725m	HB8MPX	800	10 - 35
J725m	HB8MTX	800	10 - 35
J725m	HB8MPXE	800	10 - 35
J725m	HB8MTXE	800	10 - 35
M7100	MAHG-SHMXE	136 - 174	8 - 50
M7100	MAHG-SHMXX	136 - 174	8 - 50
M7100	MAHG-SNMXE	378 - 430	8 - 50
M7100	MAHG-SNMXX	378 - 430	8 - 50
M7100	MAHG-SUMXE	450 - 512	8 - 50
M7100	MAHG-SUMXX	450 - 512	8 - 50
M7100	MAHG-S8MXE	800	10 - 35
M7100	MAHG-S8MXA	800	10 - 35
M7100	MAHG-S8MXX	800	10 - 35
Orion	D28LTX	800	6 - 12
Orion	D29LTX	900	6 - 12
Orion	D28MTX	800	18 - 35
Orion	D29MTX	900	15 - 30

Table 1

Radio programming, adjusting RF Output Power:

The radio's output power level can be set to the desired level within the power range for a specific application.

Open the radio personality, click on **Systems**, then double-click on **System Setup**
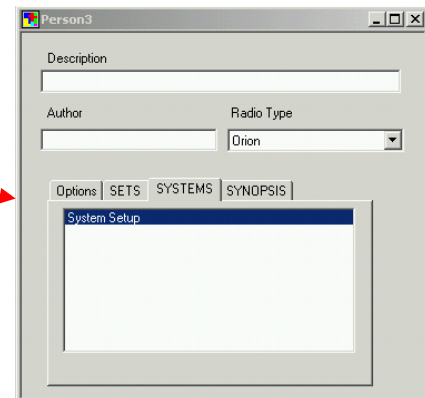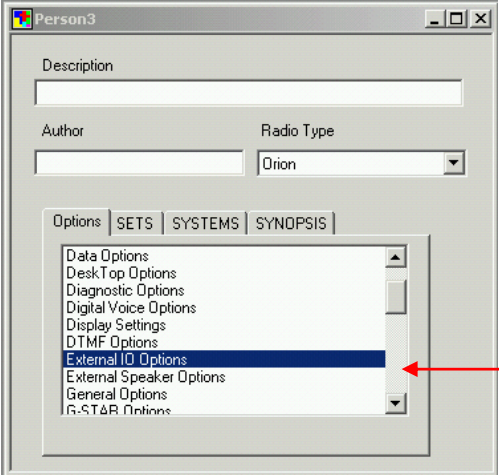
The Power Level must be changed on each system in the radio.
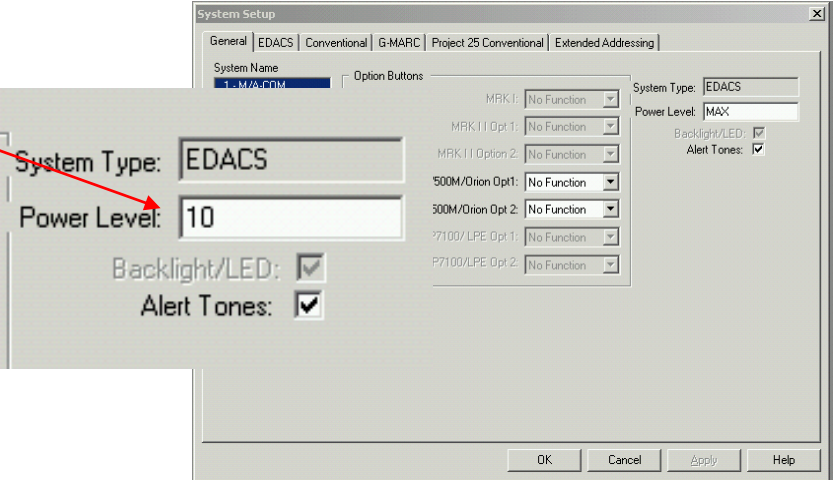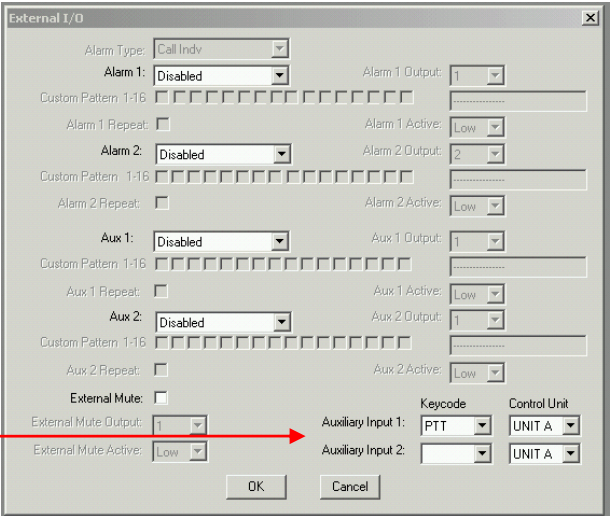
Mapping an External PTT Input:

One of the radio's External Inputs must be programmed (mapped) for the Push-To-Talk (PTT) function:

Click **OPTIONS**,
then **External I/O Options**

Select the **PTT** function for Auxiliary input 1 or input 2

Mapping an External COR (Carrier Operated Relay) Output:

One of the radio's External Outputs must be programmed (mapped) for the receive **COR** function. Perform the three steps outlined below.

1. Enable the External Mute function by checking the box.

2. Select the External Mute's external output (1 or 2).

3. Select the External Mute's Active state, high or low as required to activate the external device.

When External Mute is enabled the output line assigned to external mute will follow the radio mute and unmute. The polarity of the output depends on the selection in the External Mute Active control. Mute line active high = open collector, Mute line active low = ground.

Aux 1 Output
Found on Pin-22 of the DB-25 (Extended) Options Connector. Ground is Pin-1 of the same connector

Aux 2 Output
Found on Pin-1 of the 6-Pin (Basic) Options Connector. Ground is Pin-6 of the same connector.

Audio Interface and PTT Connections:

Figure 1 and Table 1 show the proper microphone, receive audio, Aux output and PTT (Push-To-Talk) connections for the mobile radio. Use P3 and P4 for all connections. Figure 1 represents the **19B802544P7** Remote Mount and **CA101288V2** Front Mount radio cables.

The **CA101288V4** *Remote Mount Extended Option Cable* (Not Shown) has a high density DB15 (P5) connector that is primarily intended for programming and loading of cryptographic codekeys, but has limited applications for audio interfacing. The available connections are shown in Table 2.

COR (Aux) Output Option #2 P3 pins 1 & 2 (ground)	
PTT Connection Option #2 P3 pins 5 & 6 (ground)	

WARNING:
P2, Pins 1&2 are 15 watts RMS, 4Ω balanced.

RX Audio   P4 pin 13 or 16 & 12 (ground)
TX Audio   P4 pin 11, 15 or 24   & 12 (ground)
PTT Connection Option #1   P4 pin 21 & 1 (ground)
COR (Aux) Output Option #1   P4 pin 22 & 1 (ground)

P3
Pin	Signal
1	OUT2
4	INP2
5	
2	HKSW
3	GND
6	

P2
Pin	Signal
1	SPKR2
2	SPKR1

P4
Pin	Signal
25	SW A+
10	IGN SEN
14	CTL ON
22	OUT1
21	INP1
6	CTS
20	RTS
3	XDATAOUT
2	XDATAIN
1	SUP GND
16	XTONDEC
13	VOL HI
15	XTONENC
24	EXTMIC
11	MIC HI
12	ALO
19	SONOFF
18	HORNRING
8	SDATA

Figure 1

Signal Function	Connector / Pin Number	Pin Description & Comments
COR (Aux 2) Output	P3 pin1	Auxiliary Output #2 (Ground is Pin-2 on same connector)
PTT Ground	P4 pin1	Supply Ground
Microphone	P4 pin 11, 15 or 24	Mic Hi or XTONENC or EXTMIC
Common Audio Low	P4 pin12	*ALO* or "Audio Lo"
RX audio for Headset earphones	P4 pin13 or 16	Vol Hi or XTONDEC
PTT connection 1	P3 pin 5	Auxiliary Input #1
PTT connection 2	P4 pin 21	Auxiliary Input #2
COR (Aux 1) Output	P4 pin22	Auxiliary Output #1 (Ground is Pin-1 on same connector)

Table 1

Signal Function	Connector / Pin Number	Pin Description & Comments
COR (Aux 2) Output	P5 pin 7	Auxiliary Output #2
Ground	P5 pin 1 and 13	Ground
Microphone	P5 pin 8	XTONENC
RX audio	P5 pin 9	XTONDEC
PTT connection 1	Not available	
PTT connection 2	Not available	
COR (Aux 1) Output	P5 pin 11	Auxiliary Output #1

Table 2

NOTE

Do not attempt to use the Speaker 1 & Speaker 2 audio connections (P2, Pins 1 & 2) for external devices that can not handle high level audio.

This high output connection delivers 15 watt RMS with a DC component into a 4Ω balanced output. An external device or the radio could be damaged if either line is grounded. It is recommended to use a 1:1 audio transformer.