

METRO REGION
800 MHz Trunked Regional Public Safety Radio System
Standards, Protocols, Procedures

Document Section:	3 - Interoperability Guidelines	Radio TOC Recommendation:
Sub-Section:	METRO 3.22.0	Date: 3/26/08
Procedure Title:	Use of Mobile/Portable Gateways to Connect to Fixed Network Interoperability Resources	
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1. Purpose or Objective:

Establish a policy and procedure for the use of mobile/portable audio gateway devices when interconnecting to ARMER conventional or trunked shared resources.

2. Operational Background:

▪ **Capabilities**

Various audio gateway devices have proliferated within the public safety community. These devices are marketed under different names but basically provide the ability to “patch” one radio system to another radio system. A partial listing of the common devices is contained in the following table.

GATEWAY NAME	VENDOR	FUNCTIONALITY
ACU-1000	Raytheon JPS Communications	Audio Gateway
ICRI	Communications Applied Technology	Audio Gateway
RIOS Portable	SyTech Corporation	Audio Gateway
SmartMSG	Codespear	VoIP/Network
TCB	Link Communications	Audio Gateway
VIPER	Telex Communications	Audio Gateway
Transpeater III	Transcrypt International	Audio Gateway
Tiger	Microvoice Corporation	Audio Gateway
Motobridge	Motorola	VoIP/Network
Wave for LMR	Twisted Pair	VoIP/Network
IPICS	Cisco	VoIP/Network

▪ **Constraints**

Unless used properly with knowledge of the networks being patched, these devices can be harmful to the normal operations of those networks. Their use can be particularly harmful to a simulcast digital trunked radio system such as the metro area ARMER system.

Mobile/portable gateways must be optimized in order to provide intelligible audio through the patch. Non-optimized gateway connections often cause message truncation (loss of words at the beginning or end of a transmission), audio holes in the middle of messages, audio level problems (too loud or too quiet), audio distortion, excessive end of message hang times resulting in “bonks” or call rejects, and other problems.

If multiple connections are established to the same resources on different gateways (one of which may be a console patch) an audio loop will occur locking up all channels/talkgroups in the patch causing constant noise which cannot be talked over by a user.

Connecting multiple patches in a “daisy chain” fashion causes excessive key-up delays, message truncation and most commonly intelligibility problems due to multiple audio processing conversions of digital to analog / receiver to transmitter, etc.

3. Operational Context:

Patching disparate radio systems is essential to facilitate interoperability between users that do not have compatible radio equipment. The preferred method of patching is currently the use of a fixed gateway (dispatch console) which is hardwired to the radio infrastructure needing to be patched. Such patches are commonly established between ARMER trunked talk groups and the metro region ARMER conventional interoperability system (METTAC-P, VLAW31, etc.) This method of patching is effective when all end users are within the coverage range of the radio infrastructures involved in the patch.

In some cases, an incident requires the interconnection of channels with no associated infrastructure interfaced with the fixed gateway system, or out of the coverage range of these channels. In these cases the use of mobile/portable gateways is necessary.

4. Recommended Protocol / Standard:

Because of the high potential for harmful interference and disruption of communications, no mobile/portable audio gateway device may be connected, attached or used on the metro region ARMER system unless the patch is setup by a trained gateway operator and such use has the approval of a certified ICS Communications Unit Leader (COML) under an approved ICS-205 Incident Communications Plan.

5. Recommended Procedure:

An agency desiring to implement a mobile/portable audio gateway patch for a pre-planned event should prepare an Incident Communications Plan using an ICS-205 form indicating the resources to be patched. If the agency does not have a certified COML, it should request assistance from a certified COML from the subsystem owner it will be connecting to or from the MESB. The COML will be responsible to review the proposed patch to determine that it will not cause interference. The

COML will also be responsible to notify the appropriate dispatch center responsible to update the status board application to indicate the resources are reserved for use.

An agency desiring to implement a mobile/portable audio gateway patch for an emergent incident should notify the dispatch center controlling the incident to inform them of the resources requested to be patched. The dispatch center will update the status board applications to indicate the patched resources are in use and patched. If the agency does not have a certified COML, it should request assistance from another certified COML and complete an ICS-205 as soon as possible for dissemination to the Incident Commander and the dispatch center controlling the incident. COML assistance may be provided remotely. If a certified COML is unavailable the appropriate ARMER Subsystem Administrator should be consulted prior to initiating the portable/ mobile gateway patch.

The following guidelines should be followed when utilizing mobile/ portable gateways:

- Mobile/portable gateway patches should only be setup by a trained gateway operator that is familiar with the equipment and the resources to be patched.
- Radio resources should only be contained in a single patch in a single mobile/ portable gateway. “Daisy chaining” resources across multiple gateways, e.g. a talk group to a conventional channel in one gateway and the same conventional channel patched to a different talk group in a second gateway should not be attempted due to poor performance.
- Radio ports should be configured for COR detect rather than VOX whenever possible to reduce the problem with loss of the first few syllables.
- Prior to establishing the patch the gateway operator should make an announcement on the applicable resources that a patch is being setup.
- Upon connecting the patch the gateway operator should test the patch end to end to verify acceptable performance.
- If performance is poor, the gateway operator will make any necessary adjustments to audio levels, delay timers, tone control, etc.
- The gateway operator will make an announcement that the patch is setup and ready for use.
- The gateway operator will monitor the performance of the patch while it is in use.
- Once the patch is no longer needed the gateway operator will announce that the patch is being removed and will disconnect the patch.

6. Management:

The metro region TIC Plan will contain a list of certified Communications Unit Leaders (COMLs) and individuals identified to be trained as COMLs which may be consulted regarding the use of mobile/ portable gateways. The System Managers Group will have the responsibility to investigate and resolve problems associated with the use of mobile/ portable audio gateways.