DEPARTMENT OF PUBLIC WORKS

COUNTY OF MARIN

People serving people.

Robert Beaumont
DIRECTOR

Administration
PO Box 4186
San Rafael, CA 94913-4186
415 473 6528 T
415 473 3799 F
415 473 3232 TTY
CRS Dial 711
www.marincounty.org/pw

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March 12, 2014

MERA Executive Board
95 Rowland Way
Novato, CA 94945

Re: Update on Gateway Repeaters

Dear Directors:

At the December 11, 2013 MERA Governing Board meeting, a request was made to evaluate the need for additional gateway repeaters during the planning for the Next Generation System.

The need for interoperability usually arises during a disaster or other unusual event (as existing systems are set up to handle normal communications without interoperability).

The basic function of a gateway/deployable repeater is to interconnect disparate communications devices (typically two-way radios) and allow audio to be patched between any and all of those devices as needed. In many cases the term "Gateway" is used interchangeably with "deployable repeater site", "mobile repeater site" and "mobile extender". For purposes of this document, the term "Gateway" will be used. Mobile gateways can connect cross-band portable and mobile radios, base stations, telephones, cell phones or satellite phones. Each device acts as an access point for transmissions to or from the network to which it is associated. For example, a radio attached to the gateway will be programmed to transmit or receive on a particular channel or talk group. The gateway is able to connect the audio provided by a speaker connection on one device and patch this audio to the microphone connection on one or more other devices. Because the gateway connects to these different audio devices, it does not actually transmit or receive any RF itself.

The majority of cross-connections are required between agencies located on different frequency bands where the incident has occurred. The local connections mainly take place with a gateway system, while the "Wide Area" connections take place over an IP-based phone or data network. The area covered by an individual agency typically encompasses a political region such as a city, county or group of counties.

If the gateway is connecting disparate radios systems (i.e. 800MHz trunked to UHF Digital Conventional to VHF Analog Conventional) the interface radio and
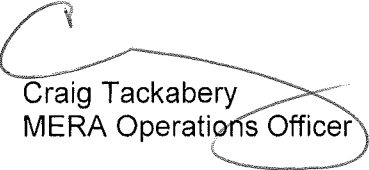
the remote radios have to be within coverage of their supporting infrastructure in order to work with the gateway. <u>The audio gateway does not extend the coverage of a radio outside its own system even if the gateway has interface radios to support that system.</u> This is especially important for gateways that are deployed to the scene of an incident. If users go beyond the coverage of their home system and still want to participate in patches supported by the gateway, they must switch to a talk-around mode for localized communications.

The above paragraphs were extracted from the Cal-EMA Statewide Gateway Units Standards, Protocols & Procedures.

Cost of a gateway depends on capability and number of channels required. It can range from as little as $500 for a simple gateway, to $30,000+ for a milspec, multi-channel gateway. These costs do not include the radios required for the RF control. Each interface module takes the audio and control signals of its associated agency and converts them to signals that can be understood by the rest of the system. Attached are example of gateways currently in Marin.

This item was discussed at the March 5 MERA Operational Issues Working Group meeting and there was general consensus that while gateways are important tactical tools, there is no need identified at this time for additional units, and provision of gateways does not need to be a MERA regional program. We recommend that the Executive Board concur with this recommendation and direct staff to report this at the next Governing Board meeting.

Very truly yours,

Craig Tackabery
MERA Operations Officer

Examples of Existing Gateways in Marin

Owner	Type	Approx. cost	Recent deployment
MERA	None		
County Radio Shop	ACU 1000	$15,000	Bridge shooting Patched MERA to
Coast Guard			
SO-Search and Rescue	ACU XXXX	UNK	Coast search and rescue
GGNRA	ACU 1000	$10,000	Training with Marin County patch to
GGNRA			
Sonoma County	UNK	UNK	Single Channel Patches VHF to UHF
and 700			
			MHz

Typical Gateway patching panel
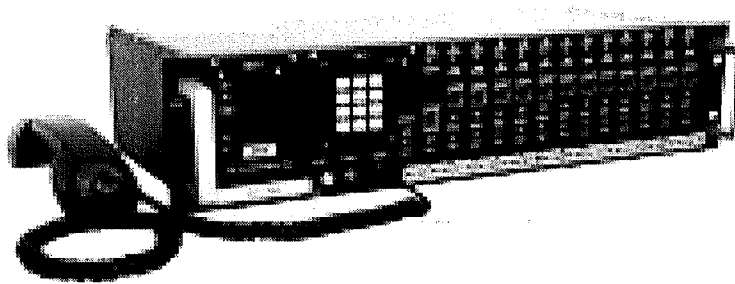
Typical Gateway computer control screen