

Q & A

Response to selected RAVE issues

Q: With the added features and current cost of network switches, why would one consider a repeater network for a new RAVE™ installation?

A: At one time this was one of the more common questions for new installations. Now that network switches are competitively priced with repeaters, the install base has moved almost entirely to switched LANs. Ethernet repeaters are still supported though and provide at least one benefit over network switches for small installations. Repeaters allow the use of more multicast bundles and do so more reliably. Each LAN or virtual local area network (VLAN) in a switched network design should limit multicast delivery to no more than 4 bundles. Repeaters allow at least 8 multicast bundles per LAN. If the system requirements call for no more than 64 audio channels that must be multicast to two or more destinations, a repeater network may still be a viable solution.

Q: When configuring the RAVE's front panel rotary switches, the bundle assignments shown in the SNMP browser report a different value. Why is this?

A: The front panel rotary switches on RAVE are encoding devices. These encoders invoke commonly used features and can be used to assign a system name to the RAVE as well as to assign bundle values. It so happens that switch positions 1 through F translate to bundle values 1 through 15 directly. All other switch positions require adding 100 hexadecimal to the switch positions prior to converting to decimal in order to obtain the correct bundle value. Optionally, the value on the switches can be converted to decimal first and adding 256 to the result will yield the correct bundle assignment, as reported in the SNMP browser. Refer to our on-line documentation and the rotary switch charts available on the QSC Audio and Peak Audio websites.

Q: How do you determine and configure the audio resolution on RAVE products?

A: RAVE products ship from the factory with audio resolution configured for 20-bit. That is to say, RAVE transmitters populate a bundle with 8 channels of 20-bit audio. Audio resolution from the AES receivers or ADCs is always 24-bit. Audio resolution can be determined at the receiver or transmitter via software access to the management interface (MI) variables using SNMP. Configuration of audio resolution is available on a per channel basis by altering the MI "txSubFormat" variables at the transmitter.

Receivers detect the in-coming bundle's channel resolution and process it accordingly. Resolution is not configurable at the receiver. **It should be noted that bundle channel count at the transmitter (txSubCount) may need adjustment if all channels are configured for 24-bit.*

Q: Why is the amount of multicast bundle delivery so limited with RAVEs operating on network switches?

A: There is an assumption that this is related to RAVE hardware. However, this issue relates to the previous question above. The practical limit of multicast transmitters is 4 per LAN or VLAN on network switches. This is because unsolicited multicast, as well as solicited multicast and unicast bundles, are delivered to each node on a network switch. Too much unsolicited traffic can quickly flood the port. On repeater networks, bundle delivery is tightly controlled by the CobraNet™ protocol. Bandwidth utilization on repeaters is more efficient and the amount of multicast bundle delivery is greater. However, network switches provide a much greater channel capacity overall and tolerate data communications and control and monitoring.

** Refer to the Peak Audio website for authoritative specifications regarding CobraNet features and documentation.*

Q: Is it possible to run my QSCControl network with my RAVE network?

A: Most venues continue to specify isolated networks for audio, data and control. However, it is possible to implement all of these communications requirements using the same network hardware. A number of precautions must be adhered to. All networks should be segregated with VLANs and CobraNet audio should be given the highest priority. Additionally, switch port setup requires that the RAVEs auto-negotiate their connections and establish their links at 100BaseTx. QSCControl uses 10BaseT Ethernet and 100BaseTx multicast traffic, if not filtered, can saturate the port. A network designer should consult with QSC's Installed Sound Division before implementing an integrated solution.

Q: Can a RAVE operate on an asynchronous transfer mode (ATM) network?

A: ATM has long proclaimed to be the solution to isochronous networks. This is due to cell-based switching which uses a fixed packet size. Theoretically, this should allow for predictable and fixed latency throughout the network. Unfortunately, ATM protocol implementations from one manufacturer may not provide for interoperability with another. Additionally, bridging of Ethernet packets to ATM may cause problems. However, QSC has successfully implemented RAVE on a few ATM networks. Note that RAVE products are supported by QSC Audio Products for use with Fast Ethernet repeaters, switches and approved media converters only.

Q: When trying to upgrade a RAVE using the CobraNet Discovery utility, the RAVE model isn't recognized or is incorrect. Is there a procedure for identifying these units?

A: With the initial CobraNet firmware release of version 2.5.16, the model of the RAVE may not be recognized correctly by Discovery. This is due to some RAVE units shipping prior to SNMP support in firmware when there was no need for model reporting. The problem is generally that there is no distinction between analog and AES/EBU models. When updating these units with Discovery, make sure that the firmware version matches the model correctly. Note that it is also possible to reprogram a unit with version 2.5.16 with a version that correctly reports the model. Contact QSC's Technical Services department for details.

Q: Some of the older RAVE units came with an RJ-11 connector for use with serial data. Why was this feature removed?

A: The RJ-11 connector was provided for piping serial control data over the CobraNet network. There was once an application requiring differential signaling of serial data. This data was not related to CobraNet or QSC's QSControl. Its use was limited and the connector was therefore removed. However, the feature for bridging serial data onto CobraNet still exists with all RAVE products. The RS-232 (DB-9 type connector) provides an interface, which allows a serial communications port on a PC or other compatible device to be connected to a RAVE. The PC can then bridge serial data onto the CobraNet network. Note that the serial data is not assigned a unique destination and is available to all RAVES on the network. Point-to-point communication requires altering the management interface (MI) variables for the serial transmitter and receiver via software.

Q: *Scenario:* An existing RAVE network is operating with the "version 1" CobraNet protocol. New RAVES were purchased in an effort to expand the network. After connecting the units to the network, the new RAVES display flickering LEDs on the audio meters and reset themselves. What is required to add additional RAVES or other CobraNet devices to my network?

A: QSC Audio has been shipping versions of the RAVE family for several years. As a result, early editions of the RAVE line are not compatible with the RAVE "s" series or with CobraNet products from other manufacturers. This is not a hardware problem but a protocol incompatibility issue. The incompatibility is isolated to early RAVE and Rapid Rave units supporting version 1 CobraNet. However, *all* RAVE units can be upgraded to the version 2 CobraNet. Depending on the build of the unit, the upgrade will require new firmware and possibly servicing some internal programmable devices. Please contact QSC Audio's Technical Services department to discuss the best upgrade path for your series 1 RAVES.

Q: Attempting to alter the bundle assignments through the front panel rotary encoders on the RAVE fails. However, audio distribution operates properly. What could cause this?

A: RAVE products support configuration and monitoring of the management interface (MI) variables through software using SNMP. When user-configurable MI variables are “persistent” (stored in permanent memory), the front panel rotary encoders are locked out. Persistence is invoked with the “flasPersistEnable” MI variable. In this state, the last value on the rotary switches can be used as the system name “sysName” for the RAVE (more commonly, the system name is a text string). Lockout can be disabled via hardware by setting all rotary switches to the “F” position and power cycling the RAVE.

Q: *Scenario:* There are a number of RAVEs operating on a mid-sized non-managed switched network. There is a need to utilize SNMP to control and monitor the audio network remotely. What is required to implement SNMP in RAVE?

A: All RAVEs supporting operation on network switches can easily be upgraded to the SNMP release. This simply requires a firmware upgrade, via trivial file transfer protocol (TFTP), through the Ethernet connection. Please contact QSC Audio’s Technical Services department or your appropriate QSC sales representative for details on this procedure.

Q: What tools are available to assist in designing a RAVE network?

A: If Ethernet principles need to be reviewed, there are a number of resources available to get started. QSC’s website provides some links to these resources.

The first place to turn for CobraNet specific information, requirements and specifications should be the Peak Audio website. Additionally, Peak Audio provides applications such as CobraNet Discovery to help with device programming, assignment of Internet Protocol (IP) addresses and general visibility of network metrics. Peak Audio has also released CobraCAD, a new CobraNet network design tool.

A number of off-the-shelf SNMP applications are available in the network industries, which provide access to control and monitoring of RAVE devices. Refer to the QSC Audio and Peak Audio websites for more details regarding these applications and their use.