

## RAVE Bundle Assignments

Bundle assignments are a necessary part of configuring a CobraNet™ network. The value assigned to routing bundles, CobraNet transmitters and CobraNet receivers, is what establishes audio connectivity and the method of delivery. This reference document describes what bundles are and how the range of bundle assignment values apply to the RAVE products. Users are cautioned that bundle assignment features are governed by the current CobraNet firmware release as authored by Peak Audio. Presently, QSC Audio Products, Inc. is shipping CobraNet version 2.8.5 in all RAVE products.

### CobraNet Routing Bundles

CobraNet audio is routed throughout the network in groups of channels. These groups are referred to as audio **bundles**. A bundle can be thought of as a virtual cable between two or more end nodes, such as RAVE products, on a CobraNet local area network (LAN). Typically, each bundle carries a group of 8 audio channels. 8-channel bundles are the default configuration for most CobraNet transmitting devices, this includes RAVE products. However, user-configurable parameters may be altered to modify a bundle's channel population from 0 to 8 audio channels.

Audio connectivity between devices is established based on bundle assignment values. Bundle values range from 1 through 65535. Peak Audio has reserved groups of bundle values targeted at specific network delivery methods. There are some rules or validation requirements applied to each group of bundle values in order to establish audio connectivity between a CobraNet transmitter and CobraNet receiver. Table 1 shows the range of values in each bundle group, the method of network delivery and the validation type.

Bundle Value: indicates the decimal numeric value assigned to the bundle.

Network Delivery: indicates the method of Ethernet delivery from transmitter to receiver. Multicast deliveries are distributed to all nodes on the network except the point of origin. Therefore, the number of receivers listening to a multicast bundle is theoretically limitless. Unicast deliveries are distributed to a single end node. Therefore, unicast deliveries are generally point-to-point. It should be noted that there is a user-configurable parameter that allows unicast bundles to become multicast. This happens when a

specified number of receivers assigned to the bundle has been exceeded. RAVE products shipping with CobraNet version 2.5.16 had this parameter set to “1” by default. With version 2.5.16, two or more receivers assigned to a unicast bundle would cause the transmitter to convert to multicast delivery.

Bundle Value	Network Delivery	Validation		
		Audience	Transmitter	Receiver
1 through 255	Multicast	Public	1 only	Multiple
256 through 65279	Unicast/Multicast	Public	1 only	1 only (default)
65280 through 65535	Unicast/Multicast	Private	Multiple	1 only (default)

Table 1

Validation

(a) Audience: indicates whether a request to use a bundle assignment is made publicly or privately. Public bundles request permission from the CobraNet conductor. The conductor will grant permission for only one transmitter to use a given bundle assignment value. The conductor will grant permission for only one receiver to listen to a unicast bundle unless the transmitter is configured to deliver to multiple destinations. Receivers do not have to ask permission to listen to multicast bundles.

Private bundles are resolved between the transmitter and receiver. Private bundles require the receiver to have prior knowledge of the transmitter’s physical address (MAC address). Private receivers ask permission from the transmitter. Since physical addresses are required as part of the validation for private bundles, there may be multiple bundles using the same value. However, there cannot be multiple transmitters using the same bundle value destined for the same receiver.

(b) Transmitter: indicates the number of transmitters that occupy a bundle assignment.

(c) Receiver: indicates the number of receivers that can listen to a particular bundle value.

◆ See the “CobraNet Technology Datasheet”, at the Peak Audio website, for a complete and official description of bundle assignments and delivery methods.

**Operation of RAVE’s Front Panel Rotary Encoding Switches**

RAVE bundle assignments may be configured through hardware or software. Hardware accessibility is provided with four, sixteen-position rotary switches located on the RAVE’s front panel. The rotary switches are hexadecimal encoding devices that invoke various management interface (MI) configurations and assign bundle values. When

assigning bundle values, the four switches are partitioned into two groups; each with two rotary switches.

On the RAVE 188s, 188s-24, 88 and 88s models, the two leftmost switches set the unit's transmit bundle assignment. The transmit bundle value determines what assignment will be used for the out-going audio group destined for the Ethernet network and any associated receivers. The two rightmost rotary switches set the unit's receive bundle assignment. The receive bundle value determines what assignment will be used to listen to the in-bound audio group received off of the Ethernet network. In essence, which transmitter the receiver will listen to.

On the RAVE 161, 161s-24, 81 and 81s models, both pairs of front panel rotary switches are used to set the unit's transmit bundle assignments. Note that these two groups of switches must be set differently for public bundle, as only one transmitter is allowed to occupy or "talk" on any given bundle assignment.

On the RAVE 160, 160s-24, 80 and 80s models, both pairs of front panel switches are used to set the unit's receive bundle assignments. In multicast mode, these two groups of rotary switches can be set to the same bundle assignment, as multiple units can "listen" simultaneously to a single network address.

### Encoding Values of RAVE's Front Panel Rotary Switches

The rotary switches on RAVE products can represent 256 values per group. This is far less than the number of bundle values available, not to mention MI features. Therefore, the rotary switches are used to configure commonly used MI variables and assign a subset of the available bundle values.

The bundle assignments currently available through the rotary switches are described in the following section. The values in the following section, shown in bold, are the digits represented on the perimeter of each rotary switch group. An arrow pointing to the location on the switch perimeter indicates the value.

- **0 1** through **0 F** represent public bundle values 1 through 15. These are multicast bundles and will be delivered to all nodes on the network. Multicast bundles are available to any unit listening on the *same* bundle assignment as that of the transmitter.
- **1 0** through **7 F** represent public bundle values 272 through 383. These are unicast bundles and will be delivered to a single destination only when a receiver is assigned the *same* bundle value as the transmitter. With CobraNet version 2.5.16, if more than one receiver is listening on the same unicast bundle, the transmitter defaults to multicast delivery.
- **8 0** through **F E** represent public bundle values 384 through 510. These are unicast bundles and will be delivered to a single destination only when a receiver is assigned the *same* bundle value as the transmitter. Setting the leftmost rotary switch to **8** or

above invokes the external synchronization feature. A RAVE acting as the system conductor will expect a valid clock applied to its rear panel “Sync Input”. The conductor will synchronize to this external clock and redistribute it throughout the network. A RAVE acting as a performer on the network will simply assign unicast bundles with the given values.

- **F F** and **0 0** are used for reserved functions. **F F** is intended for serial programming and disabling software lockout on the RAVE device. The **F F** configuration on the rotary switches should be avoided. **0 0** is a null bundle assignment and disables audio delivery and reception for the associated group. **0 0** should be used to conserve network bandwidth and avoid unintentional bundle delivery when no audio communications is required for the group.

### **Bundle Assignments via Software**

Bundle assignments on RAVE products may be configured through the software interface. The software interface provides accessibility to all public and private bundle assignments for RAVE products.

Software configuration requires an SNMP application capable of writing to the MI variables, the “peakAudio” management information base (MIB) file and CobraNet version 2.6.9 or greater installed in the RAVE device.

Bundle variables are referred to as *channels* in the MIB. The specific variables related to control and monitoring of public bundles are “txChannel” and “rxChannel”. Refer to the CobraNet Technology Datasheet and related documents on the Peak Audio and QSC Audio websites for more information on SNMP and software configuration.