

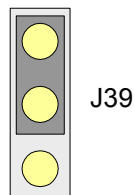
Configuring RAVE 81s and 88s to Sync to AES3

The new RAVE™ “s” series AES/EBU input models provide some additional means for synchronizing the CobraNet™ network and deriving on-board clocks. In addition to the on-board PLL and external synch inputs available on all models, the RAVE AES/EBU input models allow the user to synchronize the network to a 48 kHz digital AES input stream. The 48 kHz stream can be used in a similar manner to the external synchronization feature where a clock is applied to the rear panel “Sync Input” BNC connector. However, instead of applying an external clock to the rear panel, the RAVE recovers the clock from the AES input stream off the first XLR connector. The 48 kHz recovered clock can then be multiplied to acquire the 12.288 MHz master clock, which is needed for all local audio clocks.

Two methods of synchronization from an AES input stream are supported via jumper selections at J37 and J39 located on the RAVE 81s and 88s PCBs. The 3-pin headers for jumpers J37 and J39 are available on the RAVE 81s and 88s models *only*, as the AES/EBU receiver at channel input number 1 is required.

Method 1: Synchronize to the AES input “master clock”. When the jumper on header J39 is set to “AES clock”, the CobraNet interface will disable the RAVE’s on-board PLL and instead use the 12.288 MHz clock recovered from the AES/EBU receiver at input number 1. Note that AES/EBU receivers are only available on the RAVE 81s and 88s products. Header J39 is located near the front of the RAVE PCB about midway between the status and metering LEDs. The jumper position for implementing synchronization to the AES “master clock” is shown in Figure 1.

AES Clock



CobraNet

Figure 1

As with all synchronization methods implemented via hardware configuration, the RAVE 81s or 88s must be acting as the network conductor. To guarantee that the RAVE configured for synchronization to the AES “master clock” is always the conductor, it is recommended that the unit’s conductor priority level be elevated via software with the “condPriority” variable (refer to the CobraNet Technology Datasheet description for conductor variables). Additionally, the AES input stream at channel 1 must be configured for a 48 kHz sample rate.

The advantage to using the AES “master clock” sync method is that all local audio clocks are derived directly from the AES master clock stream. As with all system synch methods, all performers slave to the network conductor. Additionally, since the network clock is distributed throughout the system, all AES/EBU receivers and transmitters will be synchronous to the AES master clock sourced by the AES receiver at input 1 of the conductor unit. .

The disadvantage to using the AES “master clock” sync method is that the on-board PLL is permanently disabled when the jumper at header J39 is in the “AES clock” position. If the RAVE device loses the conductor role it will no longer have clock pullability and will likely lose sync to the network.

Method 2: Use the recovered AES 48 kHz clock as an “external clock” source. When the jumper at header J37 is set to “AES”, the CobraNet interface on RAVE uses the recovered 48 kHz clock at the first XLR connector (AES3 signals 1 and 2) as the external synchronization clock source. This method is similar to the “external synch” or “buddy link” mode of clock distribution in which an external clock is applied to the “Sync Input” BNC connector on the rear panel of the RAVE. This method requires that the RAVE device be acting as the network conductor *and* be configured for external synchronization mode. External synchronization mode can be invoked by setting the leftmost rotary switch on the RAVE’s front panel to “8” or above. External synchronization can also be configured through software via SNMP.

Header J37 is located toward the far left side of the RAVE AES/EBU PCB just above the power supply capacitors and to the left of component U137. The jumper configuration for implementing the “external clock” mode of AES synchronization is shown in Figure 2.

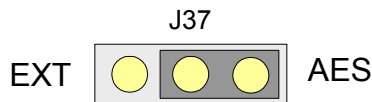


Figure 2

The advantage to implementing the “external clock” method of AES synchronization is that the on-board PLL is still available should the RAVE lose the conductor role. This allows the RAVE device to function properly in the performer role. When acting as the conductor, local audio clocks are derived from the master clock sourced by the on-board

PLL. In this application the PLL is synchronized to an external clock, which happens to be the recovered 48 kHz clock from the AES receiver at the channel 1 input.

The disadvantage to using the “external clock” method is that the unit must be configured for external synchronization mode. Audio clocks are derived indirectly from the recovered 48 kHz AES stream.

It should be noted that external synchronization of the CobraNet network requires the on-board PLL. A RAVE AES/EBU device acting as the system conductor, which is synchronizing to an external clock applied to the rear panel “Sync Input” BNC connector, must not have its jumper at header J39 configured for “AES clock”. This is a synchronization violation since the device cannot track the external clock source.