

Using the Yamaha 01V with WaveCenter/PCI and Dakota

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This document describes the basic connections and settings for using Yamaha's 01V digital mixer with either the WaveCenter/PCI (WCPCI) or Dakota card. It covers word clock settings in addition to the card and mixer settings required for basic recording and playback.

Making the connections

You can use the standard Coaxial (S/PDIF) digital I/O on the 01V to route a stereo signal between the 01V and the computer. If you have the MY8-AT option card installed in the 01V's expansion slot, you can route 8 channels of digital audio between the WCPCI or Dakota card and the 01V using an ADAT lightpipe connection. Or you can connect both the Coaxial and ADAT lightpipe I/O between the computer and the 01V for 10 channels of simultaneous I/O (8 ADAT + 2 Coaxial).

To maximize flexibility and simultaneous I/O, you'll need two 75-ohm coax cables (terminated in phono plugs) and two ADAT (or TOSLINK) fiber optic cables, so you can connect one cable in each direction for each digital interface.

- card's Coax OUT > 01V's Coax IN
- 01V's Coax OUT > card's Coax IN
- card's ADAT optical OUT > 01V's ADAT optical IN
- 01V's ADAT optical OUT > card's ADAT optical IN

Choosing the WCPCI or Dakota card's I/O modes

Since the WCPCI and Dakota optical ports can operate in several modes, it's important to make sure that they are set to ADAT mode when connecting to the 01V. Similarly, while the card's coaxial S/PDIF output always carries the signal from the "S 1:2" device, it's important to select the coaxial input as the source for the "S 1:2" input. Here's a summary of the settings you'll need in the Clock/Device Status tab of the WCPCI or Dakota card's control panel:

- Coaxial input source — In the Digital Input Status section, choose "Coax" from the dropdown menu next to the "S 1:2" Channels-In-Use icons
- Optical input mode — When you choose "Coax" as the S 1:2 input as described above, you implicitly also force the optical input to its default, which is ADAT mode. (A common setup error is to choose "Optical Input" in the "S 1:2" dropdown menu, which is incorrect for the 01V because it forces the card's optical input into "Optical S/PDIF" mode.)
- Optical output mode — In the Digital Output Status section, the gray square button to the right of the "A 1:8" Channels-In-Use icons selects the optical output mode. Make sure that a horizontal line from A 1:8 connects to the left side of this square. (If there's a line connected to that square from the S 1:2 output, the optical output is set to "Optical S/PDIF" mode, which the 01V's MY8-AT card cannot receive! To correct this common setup error, click the gray square to set the optical output to "Optical ADAT" mode.)

As described above, normally a bi-directional connection is made between the computer and the 01V. It is possible to have a single connection between the two if you only need to transfer audio in one direction. In such cases, however, it's important to make sure that the source of the audio is also set to be the master clock, since the only way the receiver can sync to the transmitter is to derive wordclock from the incoming digital connection.

Choosing the master clock

By providing a variety of wordclock options, WCPCI and Dakota were designed to give you maximum flexibility when configuring your studio. As with any digital audio setup, it's important to ensure that only one device is configured as the master clock (set to "Internal"), and that all other devices are slaved to that master device.

For a complete discussion of the Yamaha 01V's digital I/O options and how they relate to wordclock settings, refer to Chapter 16 in the 01V Owner's Manual. The rest of this document assumes that you've already installed an MY8-AT card into the 01V's option slot.

When deciding which device will be the master, it's important to consider which sample rate you intend to use. If you choose 44.1 kHz as the sample rate, then either device (card or 01V) can be the master clock. When the sample rate is 44.1 kHz, it's preferable for the 01V to be the master device, since it appears to produce more stable digital output when its wordclock setting is "Internal." However, if you choose 48 kHz as the sample rate, the card MUST be the master device, since the 01V does not have an internal 48 kHz clock setting.

The combinations of master-slave and ADAT-S/PDIF lead to four different clocking setups. Here's a checklist for each:

Checklist: 01V as master clock, WCPCI or Dakota slaving via its ADAT lightpipe input

1. Verify that ADAT cables are properly connected between the card and the 01V.
2. Press the SETUP button on the 01V until the WORD CLOCK SELECT page (page 1) is selected.
3. Using the cursor buttons, navigate to the "INT 44.1K" selection, and press the ENTER button.
4. In the WCPCI or Dakota card's control panel, make sure that the optical ports connected to the 01V are in "ADAT" mode (not "Optical S/PDIF" mode), as described earlier in this document.
5. Set the card's Clock Source to "Dig In" and choose the appropriate ADAT optical input from the dropdown menu.
6. Click "Clear Errors" and verify that the SIGNAL, FMT, and SLIP indicators for the optical input are solid green.
7. If you want to use Coaxial I/O in addition to ADAT I/O, verify that the coax cables are properly connected, and that the SIGNAL, FMT, and SLIP indicators for the coax input are also solid green.
8. Now you can use the A 1:8 (ADAT) inputs and outputs (and optionally the S 1:2 S/PDIF inputs and outputs) in your audio software application. The audio will be transferred digitally via ADAT lightpipe and Coaxial digital connections with the 01V.

Checklist: WCPCI or Dakota as master clock, 01V slaving via its ADAT lightpipe input

1. Verify that ADAT cables are properly connected between the card and the 01V.
2. Press the SETUP button on the 01V until the WORD CLOCK SELECT page (page 1) is selected.
3. Using the cursor buttons, navigate to the "OPTION SLOT" selection, and press the ENTER button to make the 01V lock its clock to the incoming ADAT lightpipe connection from the WCPCI or Dakota card.
4. In the WCPCI or Dakota card's control panel, make sure that the optical ports connected to the 01V are in "ADAT" mode (not "Optical S/PDIF" mode), as described earlier in this document.
5. Set the card's Clock Source to "Internal" and choose 44.1 kHz or 48 kHz in the Sample Rate dropdown menu (or you can leave "Lock" unchecked and your software application will automatically select the correct sample rate).
6. Click "Clear Errors" and verify that the SIGNAL, FMT, and SLIP indicators for the optical input are solid green.
7. If you want to use Coaxial I/O in addition to ADAT I/O, verify that the coax cables are properly connected, and that the SIGNAL, FMT, and SLIP indicators for the coax input are also solid green.
8. Now you can use the A 1:8 (ADAT) inputs and outputs (and optionally the S 1:2 S/PDIF inputs and outputs) in your audio software application. The audio will be transferred digitally via ADAT lightpipe and Coaxial digital connections with the 01V.

Checklist: 01V as master clock, WCPCI or Dakota slaving via its S/PDIF Coaxial input

1. Verify that two 75-ohm coaxial cables are properly connected between the card and the 01V.
2. Press the SETUP button on the 01V until the WORD CLOCK SELECT page (page 1) is selected.
3. Using the cursor buttons, navigate to the "INT 44.1K" selection, and press the ENTER button.
4. In the WCPCI or Dakota card's control panel, make sure that the S 1:2 input device is set to "Coax" (not CD-ROM or optical) as described earlier in this document.
5. Set the card's Clock Source to "Dig In S/PDIF."
6. Click "Clear Errors" and verify that the SIGNAL, FMT, and SLIP indicators for the coax input are solid green.
7. If you want to use ADAT I/O in addition to Coaxial I/O, verify that the ADAT lightpipe cables are properly connected, and that the SIGNAL, FMT, and SLIP indicators for the optical input are also solid green.
8. Now you can use the S 1:2 (S/PDIF) inputs and outputs (and optionally the A 1:8 ADAT inputs and outputs) in your audio software application. The audio will be transferred digitally via Coaxial and ADAT lightpipe digital connections with the 01V.
9. To monitor the card's S/PDIF output through the 01V, see "Routing the 01V's S/PDIF input" later in this document.

Checklist: WCPCI or Dakota as master clock, 01V slaving via its S/PDIF Coaxial input

1. Verify that two 75-ohm cables are properly connected between the card and the 01V.
2. Press the SETUP button on the 01V until the WORD CLOCK SELECT page (page 1) is selected.
3. Using the cursor buttons, navigate to the "ST IN DIGITAL" selection, and press the ENTER button to make the 01V lock its clock to the incoming S/PDIF coaxial connection from the WCPCI or Dakota card.
4. In the WCPCI or Dakota card's control panel, make sure that the S 1:2 input device is set to "Coax" (not CD-ROM or optical) as described earlier in this document.
5. Set the card's Clock Source to "Internal" and choose 44.1 kHz or 48 kHz in the Sample Rate dropdown menu (or you can leave "Lock" unchecked and your software application will automatically select the correct sample rate).
6. Click "Clear Errors" and verify that the SIGNAL, FMT, and SLIP indicators for the coax input are solid green.
7. If you want to use ADAT I/O in addition to Coaxial I/O, verify that the ADAT lightpipe cables are properly connected, and that the SIGNAL, FMT, and SLIP indicators for the optical input are also solid green.
8. Now you can use the S 1:2 (S/PDIF) inputs and outputs (and optionally the A 1:8 ADAT inputs and outputs) in your audio software application. The audio will be transferred digitally via Coaxial and ADAT lightpipe digital connections with the 01V.
9. To monitor the card's S/PDIF output through the 01V, see "Routing the 01V's S/PDIF input" later in this document.

Routing the 01V's S/PDIF input

Once you've connected coax cables between the WCPCI or Dakota card and the 01V, you need to route the 01V's S/PDIF input so that you can hear it through the 01V's outputs — using one of the two basic modes described on page 213 in the 01V Owner's Manual (Coaxial > Ch13-14, or Coaxial > Stereo Mix).

"Coaxial > Ch13-14" mode. To route the S/PDIF inputs to channel strips (so you can then adjust pan, gain, EQ, for example), press the 01V's PAN/ROUTING button until page 4 (OMNI OUT SELECT and CH13-14 FLIP) appears, use the cursor buttons to select the FLIP control, and then press the ENTER button until an 'X' appears in the FLIP icon. When the FLIP icon is set to X (rather than =), you can use channels 13 and 14 to mix and route the S/PDIF inputs, just as if the signals were coming from the CH13-14 analog inputs.

"Coaxial > Stereo Mix (cascade)" mode. Alternatively, you can mix the S/PDIF input into the main stereo bus without first routing it through the channel strips. Press the 01V's PAN/ROUTING button until page 4 (OMNI OUT SELECT and CH13-14 FLIP) appears, use the cursor buttons to select the FLIP control, press the ENTER button until an '=' appears in the FLIP icon, use the cursor buttons to select the STEREO CASCADE control, and press the ENTER button until a straight line appears in the ON/OFF icon. When the FLIP icon is set to = (rather than X), and the STEREO CASCADE switch is ON, the S/PDIF input will be mixed into the main stereo bus. To hear the signal on the monitor outputs in addition to the MAIN L/R outputs, you have to set up a path to the monitor outputs using either of these methods:

- In PAN/ROUTING page 4, set the STEREO CASCADE switch to ON, and make sure that "STEREO OUT" is a highlighted monitoring source in SETUP page 2.
- In SETUP page 2, enable "ST CASCADE IN" as a monitoring source.

Controlling the 01V's S/PDIF output

If the 01V's S/PDIF Coaxial output is connected to the S/PDIF input on WCPCI or Dakota, the audio signal available to your computer's recording applications via the "S 1:2" input device will be identical to the signal sent to the 01V's STEREO OUT analog outputs (and the same signals are also sent to the 01V's "2TR" outputs). This makes it easy to select a mix of inputs to record on the computer — on the 01V, just route the desired inputs to the main mix, and they will be sent to the computer via the WCPCI or Dakota "S 1:2" input.

Assigning ADAT digital outputs on the 01V

The section "Controlling the 01V's S/PDIF output" above discusses how you can record signals on the computer by assigning them to the 01V's main stereo mix. However, if you want to record several inputs to independent tracks on the computer, you need to assign the signals to one or more of the 01V's eight ADAT outputs (on the MY8-AT option card). Press the OPTION I/O button until page 4 (OPTION OUT SELECT) appears. Each ADAT output channel is represented by a column on this page, and you can select one of the following signals for each ADAT output:

- Bus [BUS 1, 2, 3, 4]
- Direct Out [CH 1, 2, 3, 4, 5, 6, 7, 8]
- Direct Out [CH 9, 10, 11, 12, 13, 14, 15, 16]
- Aux Out [AUX 1, 2, 3, 4]
- Stereo Mix Out [ST L or ST R]

For example, you could assign the Stereo Mix to ADAT channels 1 and 2, the direct outs of inputs 3 and 4 to ADAT channels 3 and 4, and Busses 1–4 to ADAT channels 5–8.

Monitoring ADAT lightpipe output from computer on the 01V

When playing back tracks from the computer, you can monitor them on the 01V.

1. In the audio application on your computer, make sure the tracks you want to monitor are routed to some combination of ADAT outputs A1–A8 (and/or B1–B8 if using Dakota).
2. Verify that the card and 01V are properly synchronized, as described in “Choosing the master clock” earlier in this document. In the WCPCI or Dakota control panel, make sure the SIGNAL, FMT, and SLIP indicators are solid green for the digital inputs you’re using (ADAT and/or S/PDIF).

Note: It is normal to see a diagonal slash in one or more of the indicators when you first look at them. If so, click the “Clear Errors” button, and observe the indicators again. If no errors occur within the next 15 seconds, your system is synchronized correctly.

3. Normally, the digital inputs of the MY8-AT option card are routed to mixer channels 17–24 in the 01V. To set those input channels to unity gain, press the OPTION I/O button until page 1 (OPTION IN METER) appears, and set faders 1–8 (now mapped to channels 17–24) to unity gain. (For a discussion of an alternative mixer setup in which the option card’s inputs are routed to mixer channels 1–8 instead of 17–24, see page 51 of the 01V Owner’s Manual.)
4. While the OPTION IN METER page is displayed, make sure that the “ON” buttons above each channel fader are lit.
5. Press the OPTION I/O button until page 2 appears, and press the SEL button above a channel fader to display controls for the selected channel. For each channel you want to monitor, verify that it is routed to the main stereo mix (ST), or to another bus (1, 2, 3, 4) that you’ve set up for monitoring (in SETUP page 2).
6. In SETUP page 2, if you are monitoring via the STEREO OUT, and you’ve enabled AFL (after fader listen) mode, make sure that the “ON” button above the red master fader is lit.
7. If you want to listen through headphones or the Monitor Outputs, make sure the MONITOR/2TR button (just above the MONITOR OUT LEVEL knob) is set to MONITOR (not 2TR).
8. Verify that your amplifier and monitors/headphones are powered on and connected to the appropriate 01V outputs.
9. Set the MONITOR OUT LEVEL and/or PHONES LEVEL knobs to the desired level for playing back the tracks.