SOUND DEVICES

664

Field Production Mixer
with Integrated Recorder

User Guide

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FCC Part 15.19(a)(3)

Manual Conventions

Symbol	Description
>	This symbol is used to show the order in which you select menu commands and sub-options, such as: Main Menu > Audio indicates you press the Menu button for the Main Menu, then scroll to and select Audio by pushing the Control Knob.
+	A plus sign is used to show button or keystroke combinations. For instance, Ctrl+V means to hold the Control key down and press the V key simultaneously. This also applies to other controls, such as switches and encoders. For instance, MIC+HP turn means to slide and hold the MIC/TONE switch left while turning the Headphone (HP) encoder. METERS+SELECT means to hold the METERS button down as you press the SELECT encoder.
ⓘ	A note provides recommendations and important related information. The text for notes also appears italicized in a different color.
⚠	A cautionary warning about a specific action that could cause harm to you, the device, or cause you to lose data. Follow the guidelines in this document or on the unit itself when handling electrical equipment. The text for cautionary notes also appears italicized and bold in a different color.

664 User Guide ● Rev 4-B ● April 12, 2017

This document is distributed by Sound Devices, LLC in online electronic (printable-PDF) format only. E-published in the USA.

www.sounddevices.com

support@sounddevices.com

Sound Devices, LLC
E7556 Road 23 and 33
Reedsburg, Wisconsin 53959 USA

Direct: +1 (608) 524-0625
Toll Free: (800) 505-0625
Fax: +1 (608) 524-0655

Revision History

This table provides the revision history and cross-reference links to "what's new" in this guide.

Rev#	Date	Firmware Version	Description
3-A	June 2016	3.10	Initial reformatted & updated, online only publication; replaces original, old (v2.02) print guides. Updates include: • Added new chapter on Remote Control of 6-Series mixers. • In CL-12 chapter, added new section "Disabling Output Controls" on page 167. • In File Storage chapter, added new section "Changing the Take Designator" on page 84.
4-A	Sept 2016	4.00	• Added new chapter "Wingman" covering how to use the Wingman iOS-based app that, when paired with the WM-Connect Bluetooth® Smart USB dongle, enables remote control of any 6-Series mixer
4-B	Feb 2017	4.50	• Minor clarification edit on page 33.
4-C	Apr 2017	4.51	Updated Wingman chapter with information on Wingman Password.

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Overview of Chassis

The 664 chassis is made of light-weight and durable carbon-fiber.

The front panel of the chassis features several easy-to-reach controls, switches, LEDs, and a sunlight-visible LCD screen.

Its side panels provide a variety of connection options for ultimate I/O flexibility. The top and bottom panels offer additional connectors that allow for expansion with the optional CL-6 accessory. And its back panel features connections for COMs and word clock.

Topics in this section include:

▸ **Front, Top, and Bottom Panels**
▸ **Left Side Panel**
▸ **Right Side Panel**
▸ **Back Panel**

Front, Top, and Bottom Panels

Top panel

Front panel
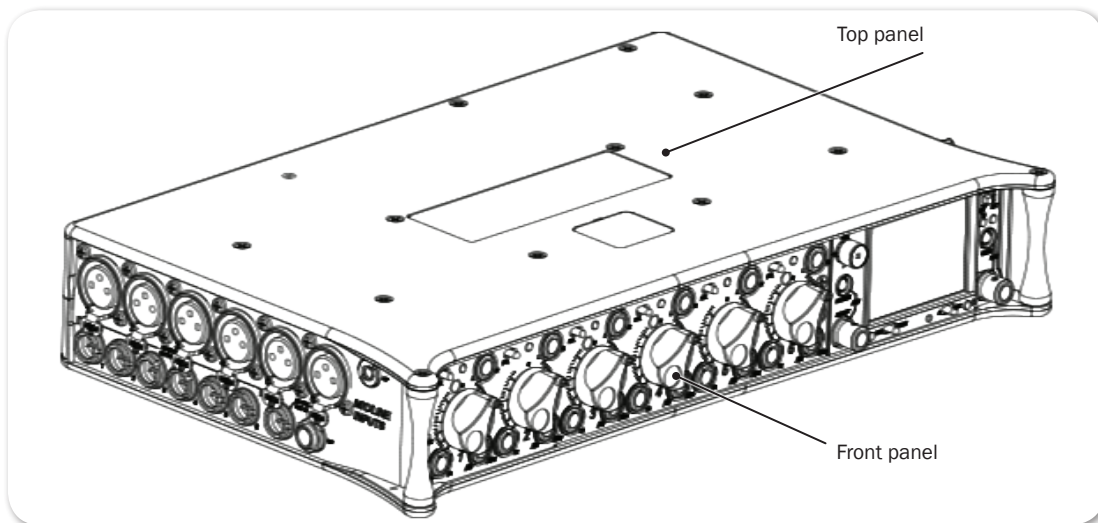
The top panel of the chassis features the SL-6 multi-pin header connector used with the optional SL-6 accessory. Similar to the top panel, the bottom panel (not shown) features the CL-6 multi-pin header connector used with the optional CL-6 accessory. Both connectors are located under removable protective covers.

The front panel provides the LCD as well as several buttons, switches, and controls as defined in the following tables.
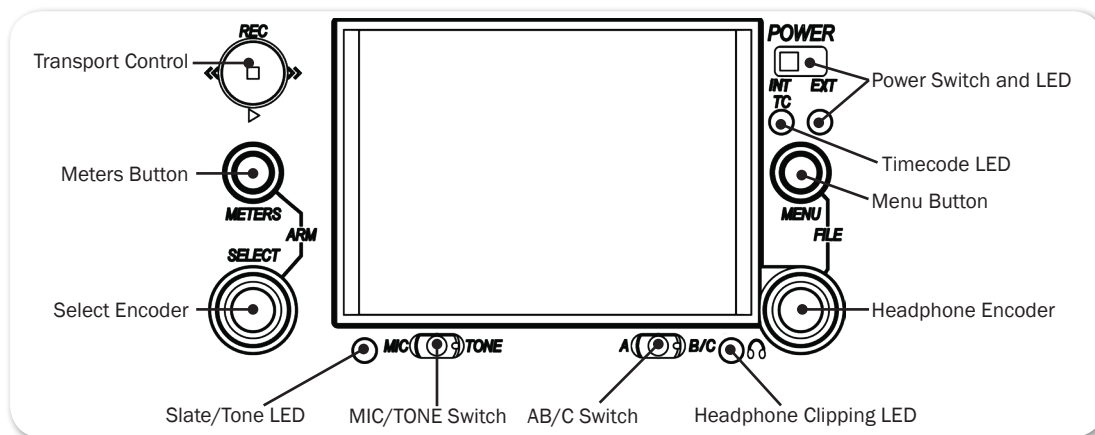
FEATURE	DESCRIPTION
Power Switch and LED	Powers 664 on and off with 3-way switch—left for internal battery power, center for off, and right for external DC power. LED indicates power status.
Timecode LED	Flashes blue to indicate whether the internal timecode generator (and QuickBoot) is active while the mixer is off.
Menu Button	Provides access to the Main menu. Used for various shortcut functions.
Headphone Encoder	Adjusts headphone level and monitor source. Used for various shortcut functions.
Headphone Clipping LED	Illuminates red to indicate headphone output is approaching clipping level.
AB/C Switch	Toggles Returns A, B, and C. Slide left for RTN A, right for RTN B, and for RTN C, press and hold the Select encoder while sliding switch right. Can be customized in the Main menu (Comms/Returns). Used for various shortcut functions.
MIC/TONE Switch	Toggle slate mic and tone generator. Can be customized in the Main menu (Comms/Returns). Used for various shortcut functions.
Slate/Tone LED	Indicates slate mic is active or tone generator is locked on.
Select Encoder	Multiple purpose rotary encoder. Used for various shortcut functions.
Meters Button	Cycles between meter views. Used for various shortcut functions.
Transport Control	Controls playback and recording. Used for various shortcut functions.

Also on the front panel, there are six sets of controls related to inputs, such as pans, faders, and trims.

FEATURE	DESCRIPTION
PFL Switch	By default, this switch has dual-functionality. It activates Pre-Fade Listen (PFL) and displays Input Settings screen for input 1-6 (slide left) and 7-12 (slide right). Slide again to deactivate. The functionality of this switch may be altered via the Main menu's Inputs > Input Mode.
	Does not affect Master Output signal. For momentary action, hold the switch for one second or longer. The input LED flashes yellow when an input's PFL is active.
	ⓘ *Because the CL-6 accessory provides separate PFL switches for inputs 7-12, when the CL-6 is attached to the 664, the dual-functionality of the six PFL switches on the 664 changes. Slide left activates PFL and slide right displays Input Settings for inputs 1-6 only.*
Fader (1-6)	Adjusts fader level for inputs 1-6.
HPF (1-6)	Adjusts corner frequency (-3 dB) of high-pass filter for inputs 1-6. Full counter-clockwise position (detented) deactivates HPF. Range is 80-240 Hz, 12 dB/oct to 6 dB/oct.
Trim (1-6)	Adjusts trim level for inputs 1-6.
Pan (1-6)	Adjusts pan between L and R tracks.
PFL status / Activity LED (1-6)	Indicates PFL status and input signal activity.

Left Side Panel

XLR Inputs

MIC/LINE INPUTS

TA3 Inputs

Slate Mic Input

Headphone Outputs

FEATURE	DESCRIPTION
XLR Inputs	Active-balanced analog microphone- or line-level inputs. Inputs 1 and 6 can also accept AES3 or AES42 (Mode 1) signal.
	[Pin-1 = ground, pin-2 = hot (+), and pin-3 = cold (-)]
TA3 Outputs 1-6 / Inputs 7-12	Balanced direct outputs (1-6); these connections can optionally be selected as analog line-level inputs (7-12).
	[Pin-1 = ground, pin-2 = hot (+), and pin-3 = cold (-). Float pin 3 to unbalance.]
Headphone Outputs	3.5mm and 1/4" TRS headphone outputs. Can drive headphones from 8 to 1000 ohm impedances to very high levels.
	[Tip = left, ring = right, and sleeve = ground]
Slate Mic Input	TA3 input for connecting external slate microphone. [Pin-1 = ground, pin-2 (+), pin-3 (-)]

Right Side Panel
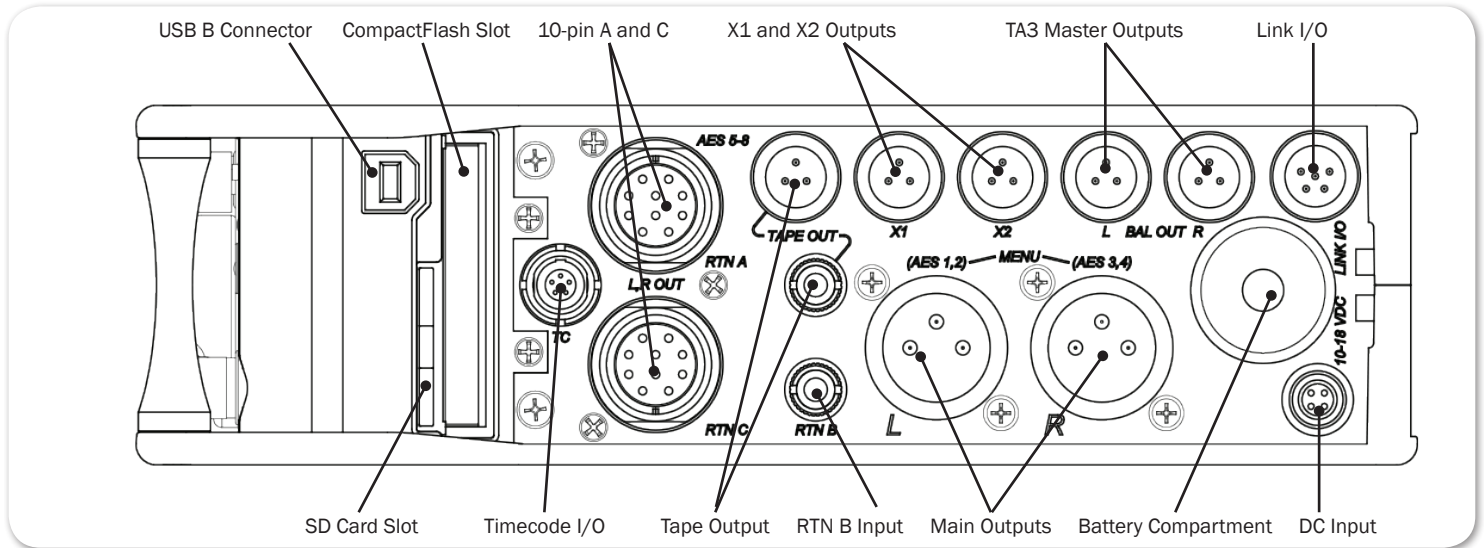
FEATURE	DESCRIPTION
USB B Connector	Factory use and keyboard connection (with adapter).
CompactFlash Slot	Accepts approved CompactFlash cards with the label-side toward the rear of the mixer. Compatible with Type I and Type II cards. High-speed UDMA cards are recommended for higher track count recording.
10-pin A and C	Each connection includes a pair of transformer-isolated Outputs and a stereo unbalanced Return input. Analog Output levels are selected between Line, -10, and Mic levels in Main menu OUTPUTS section. 10-pin A outputs can be set to AES Outputs 5,6 and 7,8 in Main menu OUTPUTS section.
X1 and X2 Outputs	Line, -10, or Mic level selected in Main menu OUTPUTS section. [Pin 1 = ground, pin 2 = hot (+), pin 3 = cold (-). Float pin 3 to unbalance.]
TA3 Master Outputs	LR balanced output: Line, -10, or Mic level selected in Main menu OUTPUTS section. [Pin 1 = ground, pin 2 = hot (+), pin 3 = cold (-). Float pin 3 to unbalance.]
Link I/O	Used to link together additional Sound Devices mixers (664, 552, 442, 302, or MixPre-D). [Pin 1 = headphone left, pin 2 = headphone right, pin 3 = mix right, pin 4 = mix left, pin 5 = link detection/ground.]
SD Card Slot	Accepts SD/SDHC/SDXC cards with the notched corner oriented toward the top of the 664. High speed class 10 cards are recommended. Insert until it clicks securely in the slot. The card should glide smoothly into the slot. Press to eject.
Timecode I/O	Timecode input and output on 5-pin LEMO® connector.
Tape Outputs	Unbalanced stereo, tape level output on TA3 and 3.5 mm connectors. [TA3: Pin 1 = ground, pin 2 = left, pin 3 = right 3.5 mm: Sleeve = ground, tip = left, ring = right]
RTN B Input	Unbalanced stereo 3.5 mm female connector for Return B audio input. [Sleeve = ground, tip = left, ring = right]

FEATURE	DESCRIPTION
Main Outputs	Transformer-balanced analog outputs on standard 3-pin XLR-3M connectors. Can be set to send AES3 digital signals (1,2 and 3,4 on L and R respectively) in Main menu OUTPUTS section.
	[Pin 1 = ground; pin 2 = hot (+); pin 3 = cold (-). Unbalance by grounding pin 3 to pin 1.]
Battery Compartment	Holds five AA (LR6) batteries for backup powering. NiMH rechargeable cells advised.
DC Input	Accepts DC voltages from 10–18 V for powering.
	(Pin 1 = Negative (−), pin 4 = Positive (+))

Back Panel

The back panel contains BNC wordclock and TA3 COM connections:
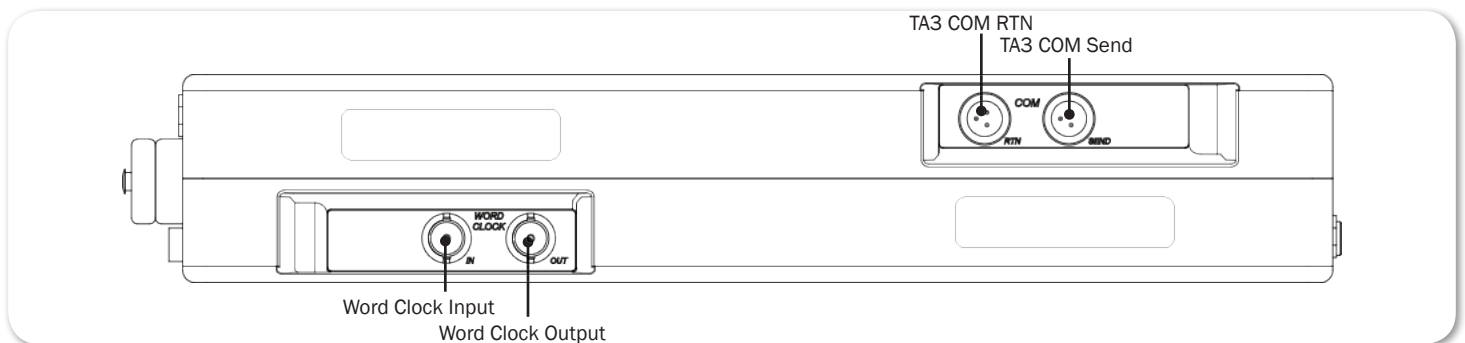
FEATURE	DESCRIPTION
Word Clock Input	Accepts word clock rates between 44.1 kHz and 48.048 kHz for synchronizing the internal recorder to external digital audio devices.
Word Clock Output	Provides word clock signal to synchronize external digital audio devices.
TA3 COM RTN	Line-level input for return feed from onset communications sources.
TA3 COM Send	Unbalanced, stereo, line-level output.

The LCD and User Interface

The LCD display is the primary source of information when operating the 664. All settings are configured via the LCD display. All signal level meters can be displayed on the LCD display.

This chapter describes meter views, including the Main screen which is displayed when no other screens are active, the Main menu, and LCD Daylight mode.

Other screens are described where applicable throughout the guide.

Topics in this section include:

▸ **Meter Views**
   ▸ Using Meter Views
   ▸ Customizing Meter Views
▸ **Accessing the Main Menu**
▸ **Customizing the LCD and LEDs**
   ▸ Using LCD Daylight Mode

Meter Views

The 664 displays important metering information at a glance on its LCD. All meter views provide various combinations of input, track, and return meters. By default, the first of three meter views is shown. This view is known as the Main screen.
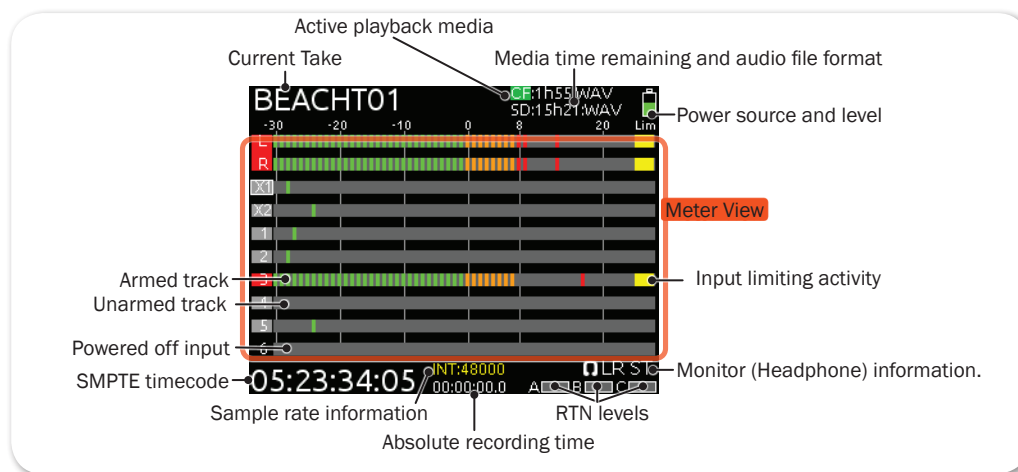
Of the three meter views, two are predefined for the 664 are:

- LR, X1X2, 1-6 — This meter view (shown above) shows left, right bus tracks as well as all 12 input tracks.
- LR, X1, X2, RTNs — This meter view shows left, right, X1, and X2 bus tracks, plus all returns.
- Off — The third meter view is off by default, but may be set to a variety of available combinations.

The following image shows the second predefined meter view.
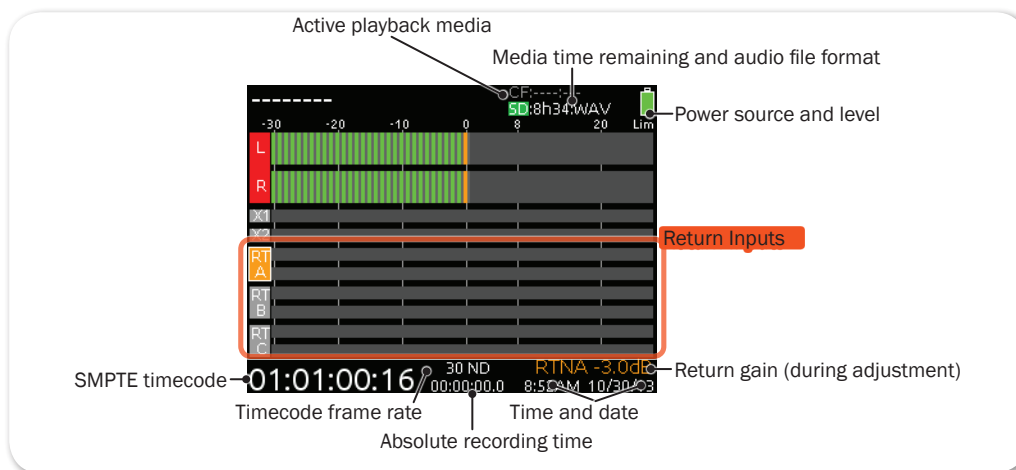
Using Meter Views

Although the first meter view is known as the Main screen, there are other screens, which may appear on the LCD, such as the Main menu or the Input Settings screen.

Regardless of what screen is visible, returning to the Main screen and its meter view is easy.

To return to the main screen at any time:

▶ Press the METERS button.

You can also easily switch to any of three different meter views.

To toggle between the three meter views:

▶ Press the METERS button. Each press of the button switches the display to the next view.

Customizing Meter Views

While the 664 provides three meter views by default, all three may be customized to display the information you deem most important. The second and third meter views may also be turned off so that only one meter view is shown as the Main screen at all times.

To customize the meter views:

1. Press MENU.
2. Turn and press the Headphone encoder to select SYSTEM > Meter Views.
3. Select the meter view you would like to change.
4. Select the display option for that meter view.

For more information on configuring the meters displayed in Meter Views, see *Configuring the Meters*.

Accessing the Main Menu

The majority of the 664's settings are configured with the Main menu.

To access the Main menu:

▶   Press the MENU button.

The Main menu is made up of categories, each with its own set of sub-menu options. Turn the Headphone encoder to navigate the Main menu and press it in to select any category or sub-menu option.
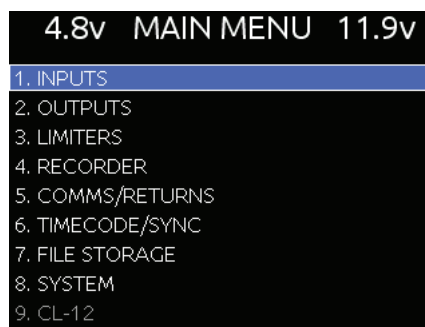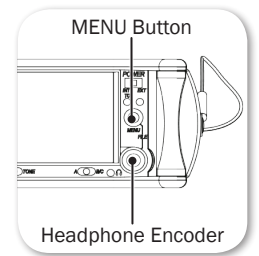
While sub-menu options are covered in more detail throughout this guide in sections related to those options, the Main menu's categories are provided with brief descriptions in the following table.

CATEGORY	DESCRIPTION
INPUTS	Settings related to channel linking, phantom power, PFL or Input modes, input to ISO routing, and input delays. See *Accessing Input Settings* for details.
OUTPUTS	Settings related to output types or levels, output sources, output routing, and output delays. See *Accessing Output Settings* for details.
LIMITERS	Settings related to input and output limiters. See *Limiters* for details.
RECORDER	Settings to target recording media, WAV sample rate / bit depth, MP3 bit rate, and recording pre-roll time. See *Accessing Recorder Settings* for details.
COMMS/RETURNS	Settings related to communications (Comm), including slate mic (source, gain, routing), comm return gain, and AB/C switch actions. See *Comms / Returns Settings* for details.
TIMECODE/SYNC	Settings related to timecode and sample clock synchronization. See *Timecode and Sync* for details.
FILE STORAGE	Settings related to file storage and metadata. See *File Storage Settings* for details.
SYSTEM	Various system settings. See *System* for details.
CL-12	Enabled only when the CL-12 is attached.

Category	Description
QUICK SETUP	Allows user to save and recall user settings to and from SD, CF, and internal memory. Also allows resetting all settings to factory default. See *Quick Setup* for details.

Customizing the LCD and LEDs

Because the 664 is a portable field mixer, it may be used in a variety of environments, including some where lighting is an issue that requires adjustments to the mixer. With some System settings, you can modify the brightness levels of the LCD, the brightness levels of the LEDs, and even enable or disable the LCD Daylight mode.

To set the LCD brightness level:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select SYSTEM > LCD Brightness.
3. Turn the Headphone encoder to change the value from 10 to 100%. Then press the encoder to make your selection.

   By default, the LCD brightness level is set to 100%.

To set the LED brightness level:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select SYSTEM > LED Brightness.
3. Turn the Headphone encoder to change the value from 5 to 100%. Then press the encoder to make your selection.

   By default, the LED brightness level is set to 60%.

Using LCD Daylight Mode

The default appearance of the LCD screen is a dark theme. However, a lighter theme is available as an alternative mode, which can make viewing in bright conditions easier. When enabled, the LCD Daylight mode may be toggled between dark and light themes.

To enable or disable LCD Daylight mode:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select SYSTEM > LCD Daylight Mode.
3. Do one of the following:
   ▶ Select On to enable.
   ▶ Select Off to disable.

To toggle LCD Daylight mode:

▶ SELECT + HP: simultaneously press the SELECT and Headphone encoders.

Headphone Monitoring

The 664 provides two headphone outputs on its left panel, several options for headphone sources including up to 10 custom presets, plus a variety of other customizable features related to audio monitoring.

Topics in this section include:

▸ **Connecting Headphones**

▸ **Selecting Headphone Source**

▸ **Setting Headphone Encoder Mode**

▸ **Configuring the Headphone Preset List**

    ▸ Defining Custom Headphone Presets

▸ **Using Headphone Source Shortcuts**

▸ **Headphone Peak LED**

Connecting Headphones

Connect headphones to either the 1/4-inch or 3.5mm headphone outputs, located on the left panel of the 664.

⚠ *The 664 can drive headphones to dangerously high volumes. Turn down the headphone gain before attaching headphones or selecting a headphone source to prevent accidental high levels. The range for headphone levels may be set from OFF, -30 dB to +20 dB.*

To adjust Headphone gain:

▶ Turn the Headphone encoder.

While adjustment is in progress, the gain value will be displayed in the lower-right corner of the Main screen next to the Headphone Source icon.

3.5mm

1/4"
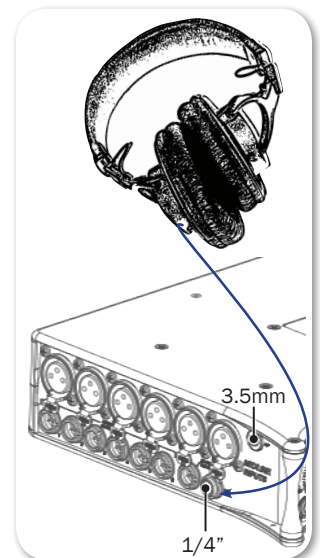
Selecting Headphone Source

The default list of headphone presets consists of six predefined headphone sources and 10 customizable presets. The predefined headphone sources are:

HP Source	Description
LR ST	Master bus in stereo.
LR Mono	Master bus summed mono to both ears.
L Mono	Left channel of master bus sent to both ears.
R Mono	Right channel of master bus sent to both ears.
LR MS ST	Mid-side stereo - master bus decoded MS stereo to headphones. This is not to be used if the inputs are already linked as an MS pair.
X1X2	Aux bus in stereo.

To select a headphone source:

1. Press the Headphone encoder to display the list of available sources.

2. Turn the encoder to change the headphone source. Options include: LR ST, LR Mono, L Mono, R Mono, LR MS ST, X1X2, and HP Preset (1) through HP Preset (10).

    The headphone source changes immediately as it is highlighted in the list.

3. Press the encoder to close the list, or wait two seconds and it will close on its own. The chosen headphone source is displayed in the lower-right corner of the Main screen next to the Headphone Source icon.

Setting Headphone Encoder Mode

The default functionality of the Headphone encoder can be reversed so that the Headphone encoder must be pressed before turning to adjust the headphone volume, and headphone source can be selected by simply turning the Headphone encoder.

To set Headphone Encoder mode:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Headphone Encoder Mode > Preset/Vol. By default, this mode is set to Vol/Preset.

Configuring the Headphone Preset List

Presets can be excluded from this list to make preset selection simpler.

To edit the Headphone Preset list:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Headphone

Preset List.

The Headphone Preset List will be displayed; presets with a blue background are visible, and presets with a black background are hidden.

3. Turn and press the Headphone encoder to toggle visibility of each preset.

Defining Custom Headphone Presets

In addition to the six predefined headphone sources, 10 options are available as custom headphone presets.

To customize a headphone preset:

1. Press the Headphone encoder to display the list of available sources.

2. Turn the encoder to choose one of the 10 customizable preset options, such as HP Preset(1).

3. Slide the MIC/TONE switch left or right.

    The Headphone Preset Editing screen appears.
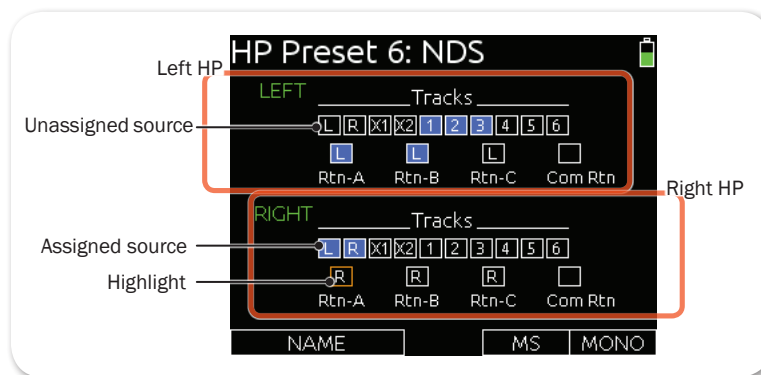
4. Do one of the following:
    ▶ Turn the Headphone encoder to move the orange highlight horizontally.
    ▶ Turn the Select encoder to move the orange highlight vertically.

5. Press the Headphone or Select encoder to change the selected source between Off (black) and Assigned (blue).

6. (Optional) Do any of the following:
    ▶ Slide the A B/C switch left to toggle MS decoding for this headphone preset.
    ▶ Slide the A B/C switch right to toggle mono summing for this headphone preset. (All active sources will be summed into both headphone channels).
    ▶ Slide the MIC/TONE switch left to name the headphone preset.

7. Press MENU or METERS to save the preset and exit the Headphone Preset Editing screen.

Using Headphone Source Shortcuts

There are a total of four headphone monitor shortcuts on the 664, go to:
RTN A, RTN B, RTN C, and COM RTN.

To monitor RTN A:

▶   Slide the A B/C switch to the left.

To monitor RTN B:

▶   Slide the A B/C switch to the right.

To monitor RTN C:

▶   Hold down the Select encoder and simultaneously slide the A B/C switch to the right.

To monitor COM RTN:

▶   Hold down the Select encoder and simultaneously slide the A B/C switch to the left.

ⓘ   *These are the default headphone source shortcuts. These shortcuts may be reversed via the Main menu's COMMS/RETURNS sub-settings: RTN Toggle Left and RTN Toggle Right.*

Headphone Peak LED

The Headphone Peak LED, located just left of the Headphone encoder, illuminates red to indicate headphone output is approaching clipping level. Monitoring without a visual indication of headphone clipping can mislead a sound mixer into thinking the output or return feeds are distorted.

Power

The 664 utilizes different powering options, such as external DC power, or it may be powered by five AA batteries.

The Power switch provides selection of two power sources, external (DC) or internal (battery). There is a large enough power reserve to switch back and forth between internal or external power sources without interrupting mixer operation.

Topics in this section include:

▶ **Powering the 664**
　▶ Using External Power
　▶ Using Battery Power
▶ **Voltage Ranges and Thresholds**
　▶ Configuring Power Settings
▶ **Power Consumption**

Powering the 664

The 664 operates on either external DC power or internal AA battery power.

To turn on the 664:

▶　Slide the Power switch to the right for external power.
▶　Slide the Power switch to the left for internal battery power.

The Power LED illuminates yellow then green. The Sound Devices splash screen appears briefly on the LCD, and then the Main screen is displayed.

As part of the Main screen, the LCD displays a DC voltage indicator in the form of a battery icon that indicates the level of the power source currently in use.

Power LED
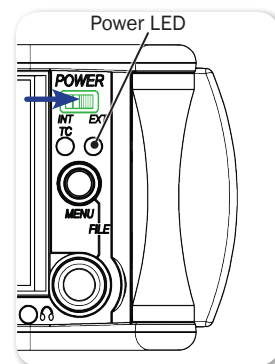
| Normal Voltage (Green) | Low Voltage | Critical Voltage (Red) |

Additionally, a numerical reading of the internal and external voltage is displayed at all times along top of the Main Menu screen. Internal voltage is shown on the left; external voltage is shown on the right.

4.8v   MAIN MENU   11.9v

Using External Power

The 664 uses only one power source at a time, with external DC power taking precedence over internal AA battery power.

To connect an external power source:

▶ Plug a DC power source (not included) into the 10-18 VDC input on the right panel.

ⓘ *Pin-4 of the locking, Hirose connector is positive (+) and pin-1 is negative (-). The external DC supply is fully isolated (floating) from the rest of the mixer for easy and safe interconnection with other external audio gear.*

Using Battery Power

The 664 uses five AA batteries as a backup to external power. Alkaline AA batteries may be used with the 664; however, NiMH or 1.5V Lithium batteries are the preferred type because they provide for longer run times compared to Alkaline batteries.

To insert batteries:

1. Unscrew the battery cap (counter-clockwise).

2. Insert five AA batteries (not included) into the battery tube. Orient the batteries with the positive (+) end facing in and the negative (-) end facing out.

ⓘ *With external power connected, depleted AA batteries may be removed from the 664 and replaced with new ones without affecting operations.*

Voltage Ranges and Thresholds

The DC voltage indicator provides power status information based on the External DC Reference parameter, which defines the voltage range and warning threshold for external DC power sources. Setting the External DC Reference to a value appropriate for the type of external power being used maximizes runtime with that source.

For instance, the indicator appears solid green when the active power source is full or operating within the defined high voltage range. As the voltage depletes, the indicator's green color drops, then changes to red when the warning voltage threshold is reached, based on the external power source's range and threshold, as shown in the following table:

Ext DC Ref	Low Voltage	Warning Voltage	High Voltage
12V Ext DC	9	10	11
NiMH	11	11.5	13
Expanded NiMH	11	11.5	18

Ext DC Ref	Low Voltage	Warning Voltage	High Voltage
12V Lead Acid	10	11.4	14
14V Li-ion	12.5	13.5	16.3
Full Range	6	11.5	18

If the external power supply's voltage drops below the low voltage threshold, the 664 reacts differently, based on the state of the internal recorder.

- During recording or playback, the 664 will automatically switch to internal batteries, if available.
- While idle (not recording or playing back), the 664 will power down.

Configuring Power Settings

The External DC Reference parameter calibrates the power level indicator according to the type of external DC source. By default, this is set to 12V Ext DC.

To configure the Ext DC Ref parameter:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Ext DC Ref.

3. Select the appropriate option for the external DC power being used. Options include: 12V Ext DC, NiMH, Expanded NiMH, 12V Lead Acid, 14V Li-ion, and Full Range

Power Consumption

Many factors influence the rate at which the 664 uses battery power (current draw). The following list highlights the larger current drawing functions.

- Microphone powering — The main source of extra 664 current draw. 48 V Phantom can draw a large amount of current depending on what model microphone is used. Two identical phantom powered microphones draw twice as much current as one.
- Audio Recorder — The recorder, whether in record or playback, draws extra current. Higher sample rate WAV recordings draw more current during recording.
- Digital Outputs — Disable digital outputs in the Main menu when they are not needed since they draw additional current.
- Output level — Higher output levels into multiple, low-impedance inputs increases current draw.
- Headphone Output circuit — High headphone output levels and low impedance headphones increase current draw.
- LED and LCD Brightness — Decrease LED and LCD brightness to reduce current draw.

Inputs

The 664 has 12 analog inputs, including six high-bandwidth mic/line inputs on XLR-3F connectors. These transformer-less preamps offer analog peak limiters, high-pass filters, input trim controls, and direct outputs.

Input connectors 1 and 6 can be selected to accept AES42 or AES3 digital signals. There are also six line-level inputs (7-12) on TA3 connectors.

Topics in this section include:
‣ **Physical Input Controls**
‣ **Activating an Input**
‣ **Accessing the Input Setting Screens**
   ‣ Setting Input Source
   ‣ Setting Input High-Pass Filters
   ‣ Setting L, R, X1, and X2 Routing
   ‣ Using a Track Name Shortcut
   ‣ Inverting the Phase
‣ **Adjusting Trim and Fader Controls**
   ‣ Adjusting Trim - Inputs 7-12
‣ **Adjusting Pan**
‣ **Accessing Input Settings**
   ‣ Configuring Linking
   ‣ Configuring Phantom Voltage
   ‣ Configuring the PFL Toggle Mode
   ‣ Configuring Input to ISO Routing
   ‣ Configuring Input Delay

Physical Input Controls

On the front panel, there are six sets of controls related to inputs, such as pans, faders, and trims.
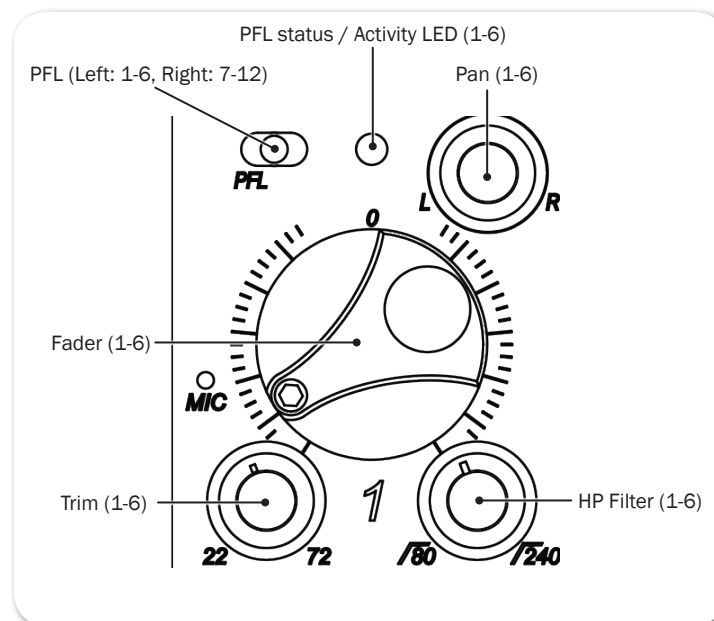
The Trim, Pan, and HPF controls may be pressed to retract the controls into the front panel when not in use.

Control	Description
PFL	Pre-Fade Listen (PFL) switch. Solos input signal in headphone monitors and displays Input Settings screen.
Fader 1-6	Adjusts fader level for inputs 1-6.
Trim 1-6	Adjusts trim level for inputs 1-6.
HP Filter 1-6	Adjusts high-pass filter level for inputs 1-6. HPF is off when control is turned to the full counter-clockwise position.
Pan	Fades input signal between L and R tracks (if routed).
PFL Status / Activity LED	• Green: Signal present on input. • Red: Signal clipping on input. • Amber: Limiter engaged on input. • Blinking Yellow: Input soloed (PFL) in headphone monitors.

Activating an Input

The 664 has six dedicated Trim controls on the front panel.

To activate an input:

1. If the Trim control for an Input is recessed, push it in and it will pop out.

2. Turn the Trim control clockwise until it clicks to activate the input.

ⓘ *The input is deactivated whenever the Trim control for that input is fully rotated counter-clockwise.*

Trim control
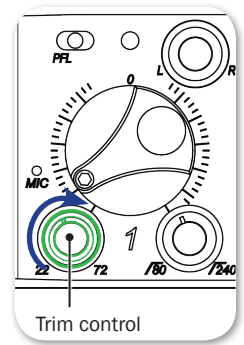
Accessing the Input Setting Screens

Each input has its own Input Settings screen. This screen provides access to the input's settings, such as input source, high-pass filter, and track routing, and also displays information about the input's gain and meter levels.

To access an Input Settings screen and PFL (solo) the input:

1. Ensure the chosen input has been activated.

2. Slide the PFL switch to the left for inputs 1-6 or right for inputs 7-12.

ⓘ *Step 2 is based on factory defaults. If sliding the switch to the left does not display the Input Settings screen, then the Input Mode is not set to its 12-Channel default. When the Input Mode is set to only 6 Channels, you must slide the PFL switch to the right instead of the left since sliding to the left is used to activate PFL without leaving the Main screen.*

All Input Settings screens share some common elements, such as channel name / number, level meter, trim gain value, fader gain value, X1/X2 routing, HPF, and source selection. Items displayed on the bottom half of the screen are adjusted by the physical controls that they are near: Select encoder, MIC/TONE

switch, AB/C switch, and Headphone encoder.
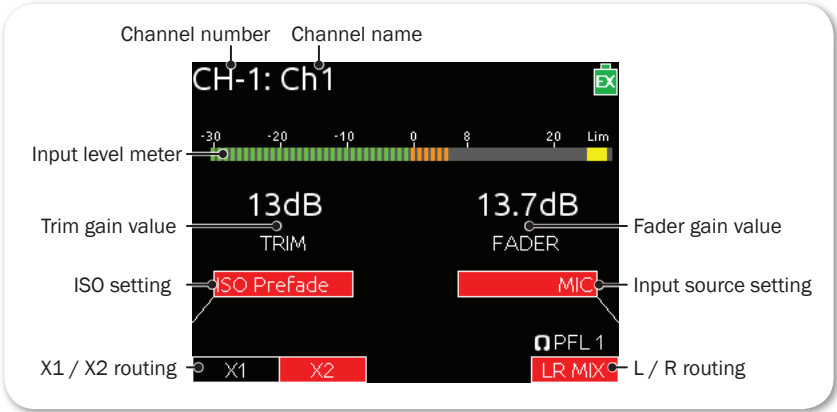
Input Settings screen for inputs 2, 4, and, 6 include an INV option for inverting phase. For more information on phase inversion, see *Inverting the Phase*.

Inputs 7-12 allow separate routing to L and R tracks, since these inputs do not have pan controls.

The Input Settings screen for inputs 7-12 also provide HPF information. For more information, see *Setting Input High-Pass Filters*.

Setting Input Source

Each input channel may be configured to receive signal from a unique source.

To set an input's source:

1. Slide the PFL switch left to access the Input Settings screen for that input.

2. Press the Headphone encoder to display the list of available input sources. Options include:
   - OFF – Use to deactivate an input without having to change trim.
   - MIC – Use for dynamic microphones or mic-level sources.
   - MIC-PH – Use for microphones requiring phantom power. Provides 48V or 12V phantom power.
   - LINE – Use for analog line level sources.
   - LINE-PH – Use for phantom-powered condenser microphones. Provides 48V or 12V phantom power, but at a line-level gain range. Useful in high sound-pressure-level environments.
   - AES42 – Use for digital AES42 (Mode 1) microphones.
   - AES3 – Use for a digital AES3 source.

3. Turn the Headphone encoder to select an input source.

Headphone Encoder

Not all types of sources are available for each channel:

INPUT	TYPES
Channel 1	OFF, MIC, MIC-PH, LINE, LINE PH, AES 42, AES 3
Channel 2	OFF, MIC, MIC-PH, LINE, LINE PH ⓘ *AES 42, AES 3 is conditionally available only if Channel 1 is already set to AES 42 or AES 3*
Channel 3	OFF, MIC, MIC-PH, LINE, LINE PH
Channel 4	OFF, MIC, MIC-PH, LINE, LINE PH
Channel 5	OFF, MIC, MIC-PH, LINE, LINE PH ⓘ *AES 42, AES 3 is conditionally available only if Channel 6 is already set to AES 42 or AES 3*
Channel 6	OFF, MIC, MIC-PH, LINE, LINE PH, AES 42, AES 3

4. Slide the PFL switch to the left again to return to the Main screen.

Setting Input High-Pass Filters

Each input features a high-pass filter (HPF), which are useful for removing excess low frequency energy from audio signals, such as wind noise. For more audio applications, engaging high-pass filter is beneficial, because audio information below 100 Hz is rarely used, especially for speech reproduction.

The filter is off by default but may be adjusted from 80 Hz to 240 Hz in 10 Hz increments on inputs 1-6. For inputs 7-12, HPF may be turned off or set to 150 Hz.

To adjust HPF on inputs 1-6:

▶   Turn the HPF control associated with the input.

To adjust HPF on inputs 7-12:

1. Access the Input Settings screen for the input to be adjusted.

2. Push the Select encoder if necessary. The HPF label will appear outlined in white to indicate adjustment.

3. Turn the Select encoder to adjust the value. Options include: Off or 150 Hz.

The 664's HPF circuit features an adjustable corner (-3 dB) frequency over a range from 80 to 240 Hz. Below 80 Hz, the filter's slope is 12 dB/octave. At higher corner frequency settings, the slope is 6 dB/octave. The purpose for this compound slope is to give additional roll-off at the 80 Hz setting to reduce wind noise and low frequency rumble. The higher settings may be used to counteract the proximity effect of directional microphones where a more gentle slope is preferred.

The 664's HPF circuit is unique because of its placement before any electronic amplification. Most mixers' HPF circuits are placed after the microphone preamplifier, such that all of the low-frequency signals get amplified. By virtue

of the 664's circuit cutting the low-frequency signals before amplification, higher headroom is achieved in the presence of signals with significant low-frequency energy.

When possible, attempt to equalize at the sound source with microphone selection, placement, windscreens, and on-board microphone filtering. Many microphones have on-board high-pass filters. Use the high-pass filters on the 664 in conjunction with the microphone's filter to increase the filter's slope.

Setting L, R, X1, and X2 Routing

Routing of inputs to L, R, X1, and X2 tracks can be adjusted quickly from the Input Settings screen. An input's routing to a track is indicated on the Input Settings screen with labels in the bottom left (X1/X2) and bottom right (L/R) of the LCD. A red label indicates the input is routed and a black label indicates the input is not routed.

To route inputs 1-6 to L and R tracks:

1. Access the Input Settings screen.
2. Slide the A/BC switch right to toggle L and R track routing together.

ⓘ *Independent assignment of signal to the L and R tracks for inputs 1-6 is adjusted using the input's dedicated Pan control.*

To route inputs 7-12 to L and R tracks:

1. Access the Input Settings screen.
2. Slide the AB/C switch right to toggle track R routing, or left to toggle track L routing.

To route any input to X1 and X2 tracks:

1. Access the Input Settings screen.
2. Slide the MIC/TONE switch right to toggle X2 routing, or left to toggle X1 routing.

ⓘ *On inputs 1 and 6, an additional routing ("PRE") is available for X1 and X2 routes. This indicates a pre-fader routing.*

Using a Track Name Shortcut

An input's track name can be quickly edited from the input settings screen.

To edit an input's track name from the Input Settings screen:

1. Access the Input Settings screen for the input to be adjusted.
2. Hold the same switch (or shortcut) used to access the Input Settings screen

for 2 seconds. (For example, if the Input Settings screen was accessed by sliding the PFL switch to the left, then hold the same PFL switch left for 2 seconds). The on-screen keyboard will appear allowing entry of a text value.

3. When finished, slide the AB/C switch right (or Enter on attached USB keyboard) to set the track name.

ⓘ *Track names can also be edited from the Take List. For details, refer to* Take List Overview.

Inverting the Phase

Phase inversion is available on channels 2, 4 and 6 of the 664.

To invert the phase of channels 2, 4 or 6:

1. Slide the PFL switch left to access the Input Settings screen for the chosen input.

2. Slide the AB/C switch to the left. The INV label on screen will illuminate red to indicate phase inversion.

Adjusting Trim and Fader Controls

The gain of an input is adjusted by two controls, Trim and Fader. This two-stage architecture is identical to the topology of large mixing consoles and provides a great deal of control. Trim is often thought of as a coarse gain control and the Fader as the fine gain control.

The Fader is the primary control used while mixing, and it affects the level of input signal routed to all post-fade destinations. Use the Fader control to make fine gain adjustments. The Fader control can be attenuated from off (at full counter-clockwise position) to +16dB above the set trim level (at full clockwise position). Operate input faders at or near 0dB, the unity gain (12 o'clock) position to optimize gain structure for the best performance.
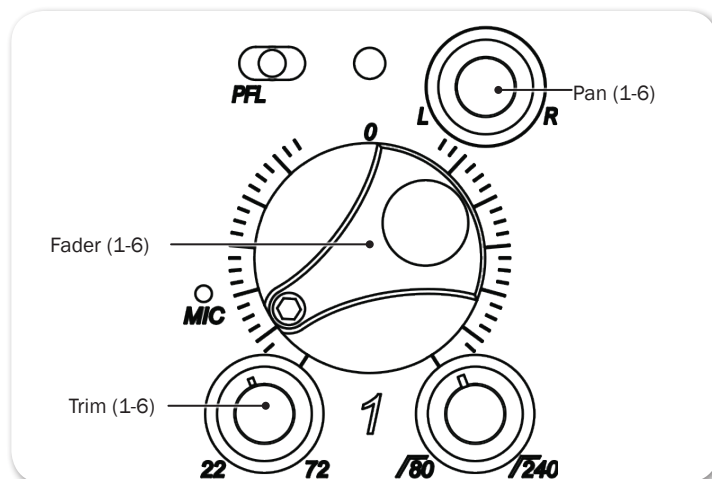
To adjust trim and fade:

1. Access the Input Settings screen for the chosen input.

2. Do one of the following:

   ▶ For inputs 1-6: Set Fader control to 0 dB, the unity gain position.

   ▶ For inputs 7-12: Trim and fader controls are on screen, and can be accessed and adjusted with the Select encoder.

3. Adjust the input's Trim control clockwise until optimal level is achieved on metering and in headphones.

   For inputs 1-6, analog mic level is adjustable from +22 dB to +72 dB of gain. Analog line level is adjustable from -18 dB to +30 dB, and AES digital trim level is adjustable from -20 to +50 dB.

   For inputs 7-12, line level is adjustable from -96 dB to +22 dB.

   The fader can be attenuated from off (full counter-clockwise) to +15 dB above the set trim level.

Adjusting Trim - Inputs 7-12

Inputs 1-6 have dedicated Trim controls, but that is not the case for inputs 7-12.

To adjust trim for inputs 7-12:

1. Access the Input Settings screen for the input chosen from 7-12.

2. Push in the SELECT encoder to select TRIM, and then rotate the SELECT encoder to adjust the trim level. The gain value is displayed on the Input Settings screen.

Adjusting Pan

The Pan pot routes inputs to the left (L) and right (R) channels of the stereo Master Bus. The Pan pot has a detent in its center (12 o'clock) position.

To adjust an input's pan:

▶ Turn the Pan pot.

After setting the pan, press the Pan pot in to recess the control when not in use.

Accessing Input Settings

The Main menu has a sub-menu of settings related to inputs. These may be used to customize the configuration of the 664.

To access Inputs sub-menu:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select INPUTS.

SUB-MENU	DESCRIPTION	OPTIONS
Ch 1-2 Linking	Sets channel linking input pair 1-2.	• Unlinked • 1-2 • 1-2MS ⓘ *MS stands for Mid-Side.*
Ch 3-4 Linking	Sets channel linking input pair 3-4.	• Unlinked • 3-4 • 3-4MS
Ch 5-6 Linking	Sets channel linking input pair 5-6.	• Unlinked • 5-6 • 5-6MS
Phantom Voltage	Globally adjusts voltage level of phantom power (on all inputs which have phantom power enabled).	• 48V • 12V
PFL Mode (Ch 1-6 only)	Sets status to either pre-fade or follows each input's routing to its ISO track.	• Pre-fade • Follow ISOs
Input Mode	Globally alters the behavior of PFL switches. This option is disabled when the CL-6 is attached.	• 6 Channel • 12 Channel

Configuring Linking

Pairs of adjacent inputs may be linked (1-2, 3-4, and 5-6). Linked inputs share a common fader. The pan control of the odd input controls the balance of both signals to the L-R, and X1-X2 tracks. The following illustration indicates which controls are active and what those controls do when inputs are linked.

Linked inputs have connecting background

Odd pan controls odd input (left) and even input (right)

Odd fader and pan are disabled

Odd fader controls both inputs

Odd trim controls odd input

Even trim controls even input
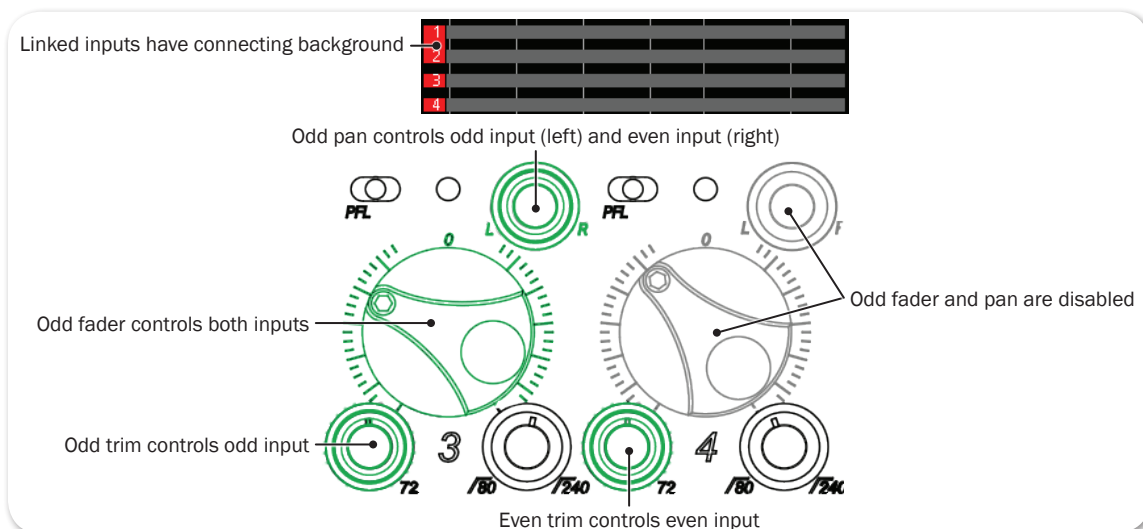
To configure channel linking:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select INPUTS and then which input pair to link. Options include: Ch 1-2 Linking, Ch 3-4 Linking, or Ch 5-6 Linking.

3. Turn and press the Headphone encoder to set linking, indicated by pairs. Options include: Unlinked, Linked (pair), or Linked (pair) MS.

   For instance, selecting 1-2 configures channel linking for input pair 1 and 2. Selecting 3-4 MS, configures Mid-Side linking for input pair 3 and 4.

Mid-Side Linking

When input pairs are linked MS, the odd channel is used for the Mid signal and the even channel is used for the Side signal. To produce a stereo signal from an MS configuration, the signal from both microphones must be processed.

Mid-side matrixing is a method for processing audio signal from a cardioid microphone and a bidirectional microphone into a stereo signal. The cardioid microphone is the Mid signal and connects to the odd input, and the bidirectional microphone is the Side signal and connects to even input. The cardioid microphone is pointed at the sound source, and the bidirectional microphone is oriented sideways—positioned with its capsule as near as possible to the cardioid microphone's capsule. The diagram shows the relative polar patterns of microphones in an MS configuration.
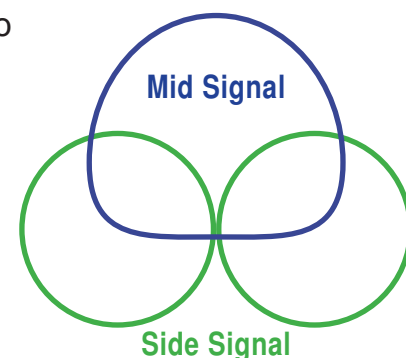
Configuring Phantom Voltage

Phantom powering is a fixed DC voltage of either 12 or 48 volts. This voltage is resistively applied to pin 2 and pin 3 of an input's XLR-3F connector, relative to pin 1. In this configuration, there is no voltage difference between signal pins 2 and 3. On the 664, the factory default sets phantom power to 48 volts, but that may be changed.

To configure phantom voltage:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select INPUTS > Phantom Voltage.

3. Turn the Headphone encoder to change the setting. Options include: 48V or 12V.

   This setting globally adjusts the voltage level of phantom power on all inputs with phantom power enabled.

Configuring PFL Mode

On the 664, the PFL switch has two modes for soloing input signal to headphone monitors. By default, the mode is set to pre-fade. However, the PFL switch may be configured so that soloing follows ISO track.

To set the PFL mode:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select INPUTS > PFL Mode.
3. Use the Headphone encoder to select a mode: PreFade or Follow ISOs.

Configuring Input to ISO Routing

By default, inputs 1-6 are routed to its associated ISO track pre-fade, in which case the fader does not affect the signal on the ISO track. This routing can be configured (on a per-input basis) to be post-fade, meaning the fader does affect the signal on the ISO track.

To individually configure Input ISO Routing:

1. Access the Input Settings screen, using the corresponding PFL switch for the input (1-6) you want to configure.
2. Press the Select encoder to select either ISO Prefade or ISO Postfade option.

ⓘ *Input to ISO Routing for inputs 1-6 also affects the pre- or post-fade status of those inputs' routing to AES digital tracks.*

Configuring Input Mode for PFL

By default, access to PFL soloing and the Input Settings screen for inputs 1-6 can be achieved with one hand. This is called 6-Channel mode.

Solo (PFL) for inputs 1-6 while in 6-Channel mode:

▶ Slide PFL switch left.

While soloing, PFL # will appear in the lower right corner of the LCD, next to the headphone icon, with # being the number of the input. For instance, when soloing PFL for input 1, PFL 1 will appear on screen.

ⓘ *Simultaneous PFL of multiple inputs (1-6) is also possible by sliding one PFL switch after another to the left. When multiple input PFLs are engaged, PFL MORT appears in the lower right corner of the screen. Slide each switch again to deactivate.*

Access inputs 1-6 Input Settings screens while in 6-Channel mode:

▶ Slide PFL switch right.

Direct outputs 1-6 may be used as line inputs 7-12, in which case the functionality of the PFL switches on the 664 changes. This is called 12-Channel mode.

ⓘ *Simultaneous PFL of multiple inputs is disabled in 12-Channel mode. Also, when switching to 12-Channel mode, meter views are not automatically changed, so inputs 7-12 may not be visible. For more information, see Meter Views.*

To enable 12-Channel mode:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select INPUTS > Input Mode > 12 Channel.

ⓘ *The INPUTS > Input Mode submenu is disabled when the CL-12 linear fader controller is connected to the mixer.*

While in 12-Channel mode, PFL soloing and access to Input Settings screens are combined for each input (1-12), with each PFL switch applying to two inputs. For instance, in 12-Channel mode, the first PFL switch on the far left of front panel applies to inputs 1 and 7. The next applies to inputs 2 and 8, and so forth. However, it is also possible to view each input's Input Settings screen without PFL.

Solo (PFL) and view Input Settings for 1-6 while in 12-Channel mode:

▶ Slide PFL switch left.

Solo (PFL) and view Input Settings for 7-12 while in 12-Channel mode:

▶ Slide PFL switch right.

Access Input Settings screens without PFL while in 12-Channel mode:

▶ SELECT + PFL: press SELECT encoder and slide PFL switch left (1-6) or right (7-12).

Configuring Inputs 7-12 as Outputs 1-6

The TA3 connections on the left panel of the 664 may be used as line inputs 7 through 12, changed to direct output for its respective 1 through 6 inputs, or turned off entirely.

To change inputs 7-12 to direct outputs:

1. Access the Input Settings screen for the input (7-12).

CH-7: Ch7

| -30 | -20 | -10 | 0 | 8 | 20 | Lim |

| 150Hz | -1.0dB | 0.0dB |
| HPF | TRIM | FADER |

CH-7 LINE ————— Options include: Line Input, Direct Output, or Off.

PFL 7

| X1 | X2 | | L MIX | R MIX |
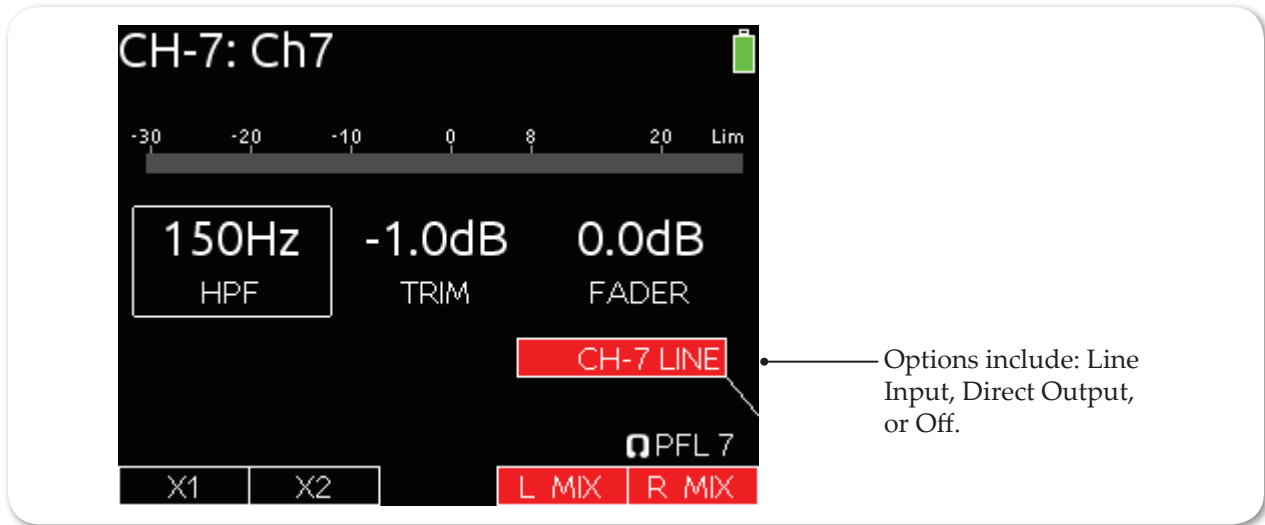
2. Press the Headphone encoder to select the DIR.OUT# option.
   The number (#) shown in the option is the number of the output's respective input (1-6).

To turn off inputs 7-12:

1. Access the Input Settings screen for the input (7-12).
2. Press the Headphone encoder to select Off.

Outputs

The 664 offers a host of analog and digital outputs with flexible configuration to accommodate complex, multi-camera setups. Whether you need to send the LR mix to multiple cameras, the camera RTN feed via IFB, or AES digital signals, the 664 is up to the task.

The 664 offers three sets of balanced left/right outputs. XLR and multi-pin outputs are selectable to AES3 digital. Two additional output buses, X1 and X2, appear on balanced TA3 connectors.

Additionally, six line-level inputs on TA3 connectors may be reassigned as direct outputs.

Output Connections

On the 664, there are four pairs of balanced analog output connections for the master bus (XLR-3M, TA3, and two Hirose 10-pin), and one pair of balanced analog output for the auxiliary bus (TA3). Additionally, there are two stereo unbalanced outputs for the master bus (TA3 and 3.5 mm tape outputs).

The Left and Right XLR-M and Hirose 10-pin connectors are each transformer balanced from separate windings. This improves isolation from potential inter-ference. The master outputs are capable of driving long cable runs.

ⓘ *See Specifications chapter for full details on the electronic specifications of the various output connections.*

Adjusting Output Gain

Output gain of the master bus and auxiliary bus is adjustable from Off, -30 to 0 dB.
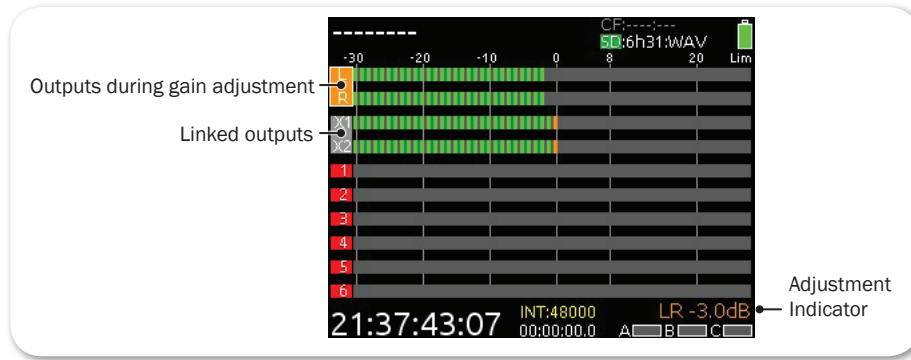
To adjust output gain:

1. Press the METERS button repeatedly until a meter view is visible that displays the master bus (L/R) and auxiliary bus (X1/X2).

ⓘ *Up to three meter views are available, as configured via the main menu option SYSTEM > Meter Views.*

2. Turn and press the SELECT encoder to choose an output and enter Gain Adjustment mode. The background color of the chosen output becomes orange, and the output gain value is displayed in the lower-right corner of the screen.

3. Turn the SELECT encoder to adjust the output gain. Outputs that are linked will be shown as a connected box, and their gain is adjusted simultaneously. If no adjustments are made within a few seconds, the selection will cancel.

4. Press the SELECT encoder or wait two seconds to exit Gain Adjustment mode.

Accessing Output Settings

The Main menu has a sub-menu of settings related to outputs. These may be used to customize the configuration of the 664 outputs.

To access Outputs sub-menu:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select OUTPUTS.

SUB-MENU	DESCRIPTION	OPTIONS
Linking	Choose which output pairs (L/R and X1/X2) are linked for the purpose of arming and level adjustment. Unlinked pairs are separated by commas. By default, only the L/R pair is linked (LR, X1, X2).	• LR, X1X2 • LR, X1, X2 • L, R, X1X2 • L, R, X1, X2

Sub-menu	Description	Options
XLR-L Out	Select the nominal level of analog output or switch the output to send AES3 digital signal on the L XLR-3M output. The default is Line.	• Mic • Line • -10 • AES 1,2
XLR-R Out	Select the nominal level of analog output or switch the output to send AES3 digital signal on the R XLR-3M output. The default is Line.	• Mic • Line • -10 • AES 3,4
10-pin A Out	Select the analog output level or engage AES3 digital on both balanced outputs of the 10-pin A output. The default is Line.	• Mic • Line • -10 • AES 5,8
10-pin C Out	Select the analog output level on both balanced outputs of the 10-pin C output. The default is Line.	• Mic • Line • -10
TA3-L Out	Select the analog output level of the L TA3 output. The default is Line.	• Mic • Line • -10
TA3-R Out	Select the analog output level of the R TA3 output. The default is Line.	• Mic • Line • -10
TA3-X1 Out	Select the analog output level of the X1 TA3 output. The default is Line.	• Mic • Line • -10
TA3-X2 Out	Select the analog output level of the X2 TA3 output. The default is Line.	• Mic • Line • -10
Direct Out Levels	Select the analog output level of the TA3 direct outputs. The default is Line.	• Mic • Line • -10
Direct Out Pre/Post	Globally select pre- or post-fader signal source for all direct outputs. By default, direct out is set to PreFade.	• PreFade • PostFade
Tape Out Source	The source for the unbalanced 3.5mm Tape Out. By default, this source is set to L/R; however, it can be used to send incoming RTN signals. This is useful for sending an IFB wireless feed of the RTN audio to the producer for video playback.	• L/R • RTN A • RTN B • RTN C
AES Output Routing	Displays the AES output routing matrix where sources can be assigned to AES output channels.	ⓘ *For more information, see Accessing AES Output Routing Screen.*
Playback to Outputs	Select destination for playback signal. By default, playback is set to All Outputs.	• Headphones Only • All Outputs

Configuring Output Linking

Output linking allows the gain, delay, and track arm status (L, R, X1, X2 only) of an output pair to be controlled with only one action. By default, the output gain of L/R are linked and X1/X2 are unlinked.

L/R and X1/X2 pairs can be linked or unlinked from the Main menu.

To configure output linking:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select OUTPUTS > Linking.
3. Turn and press the Headphone encoder to adjust linked status or output pairs L/R and X1/X2.

Setting Output Type and Nominal Level

By default, left XLR, right XLR, 10-pin A, and 10-pin C balanced outputs are set to analog Line (+4 dBu nominal) level. However, each output may be set to Mic, Line, and -10 (analog). Additionally, left XLR, right XLR and 10-pin A may be set to AES (digital).

The TA3 outputs (L/R, X1/X2) send balanced analog signal, and by default are set to Line level. However, each TA3 output may be set to Mic, Line, and -10 (analog).

Additionally, inputs 1-6 have corresponding direct outputs on balanced TA3 connections, which by default are set to Line level and PreFade. The direct TA3 outputs may be set to Line, -10, or Mic level (40 dB of attenuation versus Line).

ⓘ   *AES digital input signals are not available on direct outputs.*

To set output level and type:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select an OUTPUTS submenu, which include: XLR-L Out, XLR-R Out, TA3-L Out, TA3-R Out, TA3-X1 Out, TA3-X2 Out, or Direct Out Levels.
3. Turn and press the Headphone encoder to select the output type. Options for each output will vary, but can include: Mic, Line, -10 or AES.

Setting Direct Outputs Pre- or Post-Fade

Inputs 1-6 have corresponding direct outputs on balanced TA3 connections, which by default are set to send signal pre-fade. This may be changed globally for all six connections.

To adjust the Direct Out Pre/Post setting:

1. Press the MENU button.
2. Select OUTPUTS > Direct Out Pre/Post.
3. Turn and press the Headphone encoder to select either PreFade or PostFade.

Output Routing

Any input (1-12) may be routed post-fade to the auxiliary outputs (X1 and X2). Only inputs 1 and 6 may be routed pre-fade. For more information, see *Setting L, R, X1, and X2 Routing.*

The master L and R tracks are permanently routed to their respective outputs, unless the connections have been set to AES, in which case they use AES output routing.

Accessing AES Output Routing Screen

There is a total of 8 channels of digital output on 4 connections. Each of the XLR-3M or 10-pin A outputs can be configured to output AES3 digital signals. For more information, see *Setting Output Type and Nominal Level*.

Any track can be routed to any AES output in any combination. No sources are assigned to any of the 8 AES outputs by default.

To access the AES Output Routing screen:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select OUTPUTS > AES Output Routing.

Configuring AES Output Sources

The AES Output Routing screen consists of rows that represent each AES output and columns that represent the available source for those outputs.
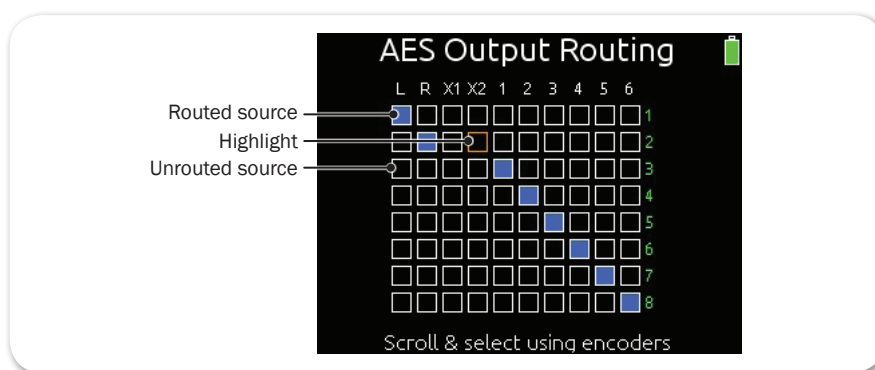
To configure output sources in the AES Output Routing screen:

1. Do one of the following:
   ▶ Turn the Headphone encoder to move the orange highlight horizontally.
   ▶ Turn the Select encoder to move the orange highlight vertically.
2. Press the Headphone or Select encoder to change the selected source between Off (black) and On (blue).

Routing Tape Output

The 664 includes two unbalanced tape-level outputs, a TA3 connector and a 3.5 mm jack. These two connectors are resistively in parallel and are isolated from the balanced outputs.

Tape Output is often used to send signal from a camera to a producer or director over an IFB. The default source for Tape Output is the master L and R tracks. However, any return signal can be routed to the Tape Output instead.

To configure the Tape Output source:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select OUTPUTS > Tape Out Source.

3. Choose a source to be routed to Tape Output. Options include: L/R, RTN A, RTN B, or RTN C.
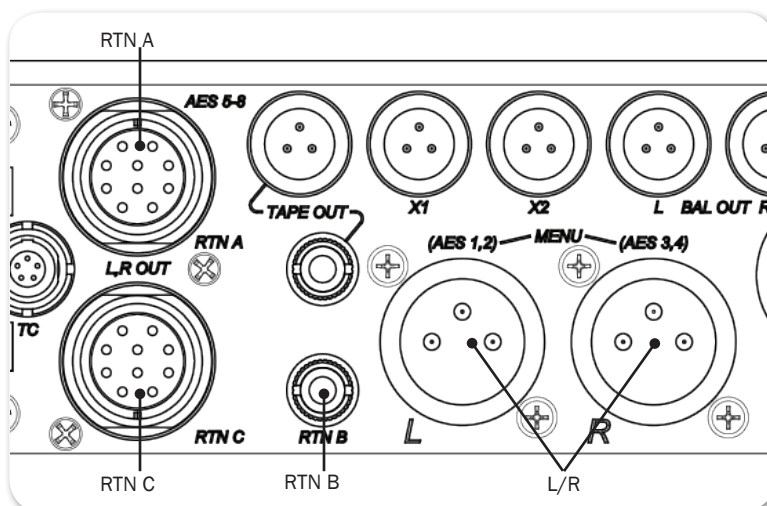
Enabling Playback to Outputs

By default, audio on L and R recorded tracks will be sent to the headphone outputs and both L and R outputs during playback. This can be disabled so that LR analog outputs do not send the playback signal to the L and R outputs.

To enable or disable playback to outputs:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select OUTPUTS > Playback to Outputs.

3. Turn and press the Headphone encoder to select either Headphones Only or All Outputs.

ⓘ *WAV files recorded on the 664 will play back to tracks as they were recorded. MP3 files recorded on the 664 always play back to the L and R tracks.*

Sending Tone to Outputs

The 664's internal tone oscillator can be used to send a predefined tone or pulse to the mixer's outputs to aid setup of proper gain staging with other equipment, such as cameras. The Left Indent pulsing tone is useful for identifying the left or odd Aux channel of the stereo pair on the receiving device.

To send a continuous tone to outputs:

▶ Do one of the following:
   ◦ Slide the MIC/TONE switch to the right for a brief burst of tone.
   ◦ Slide and hold the MIC/TONE switch for one second to turn on a continuous tone. Slide the switch again to turn off the tone.

By default, 1000 Hz tone is sent at 0 dB to the master bus (L/R), its associated outputs, and all direct outputs. Tone may also be sent to X1 and/or X2 tracks.

To send an L Ident pulsing tone:

▶ Press and hold the SELECT encoder then slide the MIC/TONE switch to the right.

By default, a continuous tone is sent to outputs while the Left Identifier signal pulses the amplitude of tone by -20 dB to the Left channel and X1 outputs. Repeat the SELECT + TONE combination to turn off the L Ident pulse.

These factory defaults may be customized via System settings. Custom configuration includes: routing to outputs or tracks, setting decibel level and frequency, and changing the functionality of the MIC/TONE switch actions.

For details, see *Setting up Tones and Bells*.

Limiters

Limiters prevent clipping by attenuating signals that exceed a set threshold. The amount of attenuation is defined by the ratio of the limiter and expressed as two numbers.

The time it takes for limiting to begin once signal has exceeded the threshold is referred to as the attack time, and the time it takes for limiting to cease once signal has fallen back below the threshold is referred to as release time.

Topics in this section include:

▸ **Overview**
▸ **Enabling the Limiters**
▸ **Adjusting the Threshold**
▸ **Linking Limiters**

Overview

Sound Devices recommends using limiters at all times. Without input limiters, high signal conditions can overload a channel and cause distortion. In normal operation, with a properly set gain structure, the threshold of the input limiter is rarely reached. The default threshold of all input limiters on the 664 is 16 dBu (4 dBu below clipping).

All 664 limiters use a 20:1 compression ratio. This means that any signal that exceeds the threshold by 20 dB will exit the limiting stage at only 1 dB above the threshold. The 664 limiters have a 1 ms attack time and a 500 ms release time.

The input limiter is actively limiting when the respective input's Input Activity LED illuminates yellow. Limiting activity will also be displayed as a yellow square on the right side of the input's meter on the Main screen. If the limiting activity is regularly indicated, reduce the amount of gain applied to the channel by turning down the Trim control.

Enabling the Limiters

When enabled, the limiters are globally activated for inputs 1-6 and all outputs. Limiters are present on both mic and line-level inputs as well as the master L/R and X1/X2 tracks. On the 664, when direct outputs are used as line inputs (7-12) there is no pre-fade limiter but there is a post-fade limiter on those channels.

To enable or disable limiters:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select LIMITERS > Limiters.
3. Turn and press the Headphone encoder to activate or deactivate the limiter. Options include: On and Off.

Adjusting the Threshold

The default threshold of all output limiters is 18 dBu; however, that may be adjusted from 4 dBu to 20 dBu in 1 dBu increments.

To adjust the threshold:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select LIMITERS.
3. Define the threshold parameters based on the following table:

PARAMETER	DESCRIPTION	OPTIONS
L, R Threshold	Sets the limiter threshold for the Master Bus.	• +4 dBu - +20 dBu (1 dBu increments)
X1, X2 Threshold	Sets the limiter threshold for the Aux Bus.	• +4 dBu - +20 dBu (1 dBu increments)

Linking Limiters

Limiters for L and R channel pairs can be linked on the 664. Anytime two limiters are linked, both channels will be limited when signal reaches the threshold in any channel of the pair.

ⓘ *Linking inputs as a stereo pair also links those inputs' limiters.*

To link limiters:

1. Press the MENU button.
2. Select LIMITERS > L, R Limiter Linking.
3. Turn and press the Headphone encoder to set linking. Options include: On or Off.

Recording

The 664 offers 16-track, polyphonic or monophonic broadcast WAV file recording to Secure Digital (SD) and CompactFlash (CF) cards. These memory cards are an easy-to-source, reliable, and affordable file storage option that also may be quickly delivered to post immediately after recording stops.

The memory cards can be set independently, recording either identical material for real-time backup, or combinations of WAV Poly, WAV Mono and MP3 files.

Topics in this section include:

‣ **Using Media**

‣ **Using the Transport Control**

‣ **Arming or Disarming Recording Tracks**

‣ **Accessing Recorder Settings**

‣ **Setting File Type and Media Track Assignment**

‣ **Changing the MP3 Bit Rate**

‣ **Setting the Sample Rate**
  ‣ F Sample Modes

‣ **Setting the Bit Depth**

‣ **Setting the Pre-Roll**

‣ **Using the Slate Microphone**

‣ **Playing Back Active Takes**

‣ **Viewing Approved Media List via Smart Phone**

Using Media

Before recording anything, install and format the media storage memory cards you intend to use in the 664. The slots for memory cards are located on the right panel behind the Media Door, which is held closed magnetically.

To insert media:

1. Firmly pull open the Media Door.

2. Insert your choice of media memory card into the slots provided.

   When inserting the SD card, ensure the bottom of the card (the side with metal contacts visible) is facing the rear of the unit. When inserting a CF card, ensure the top of the card (the side with the branding label) is facing the rear of the unit.

   ⓘ *Sound Devices Quality Assurance engineers have done extensive testing to ensure media approved for use with the 664 works reliably and provides the best performance in a variety of extreme conditions. When choosing your media, please refer to the Approved Media List available on the Sound Devices website at: www.SoundDevices.com/ApprovedMedia. For more information, see also Viewing Approved Media List via Smart Phone.*

Media Door

CF Memory Card Slot

SD Memory Card Slot
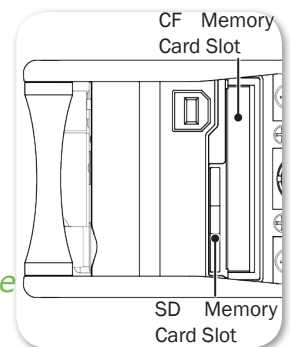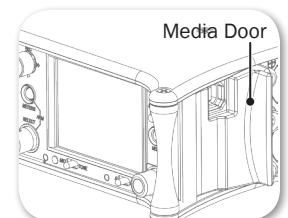
The memory card must be formatted before recording.

⚠ *Reformatting a card will erase all data on the card.*

To (re)format an SD or CF card:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select File Storage.

3. Do either of the following:
   ◦ Select Erase/Format CF to reformat a Compact Flash card.
   ◦ Select Erase/Format SD to reformat a Secure Digital card.

4. Press the Headphone encoder to begin the formatting process.

5. Read any warning message(s) and press the Headphone encoder to continue.

6. Press the METERS button to return to the Main screen.

Transport Control — MENU Button — METERS Button — Headphone Encoder
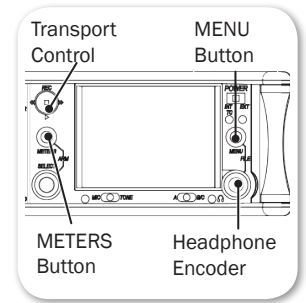
Using the Transport Control

The 5-position Transport control is used to perform all recording and playback functions.

FUNCTION	DIRECTION	ACTION
Record		Push up the Transport Control. Begins recording a new file.
Pause / Stop		Press in the Transport Control. While recording, press once to stop recording. While in playback, press once to pause, and press again to stop. While in standby, press and hold to display next take name.
Play		Push down the Transport Control. Begins playback of the last file recorded or file currently loaded.
Rewind / Load previous take		Push the Transport Control Left. While in standby, push left to load the previous take. While in playback, push and hold left to rewind.
Fast forward / Load next take		Push the Transport Control Right. While in standby, push right to load the next take. While in playback, push and hold right to fast forward.

To make a recording:

1. Push up the Transport control. Recording will begin.

    While recording, both the take name background color (top of Main screen) and timecode counter (bottom left of Main screen) will become red, and the absolute time counter (bottom of Main screen) will run. Additionally, the time remaining value of CF and SD will appear yellow while the media is being accessed.

Take name during recording   Yellow text indicates media is being written to

Timecode during recording
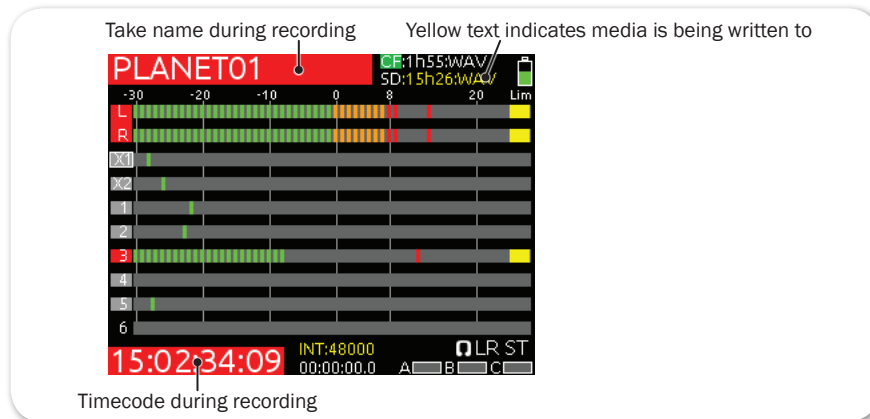
2. Press in the Transport control to stop recording.

ⓘ *Some transport controls, such as start/stop record and arming tracks may be done from the Wingman app. For more details, see Wingman Integration: 6-Series.*

Arming or Disarming Recording Tracks

The 664 features 16 recording tracks. Each of the 12 inputs is permanently routed to its associated ISO track. Buses L, R, X1, and X2 can also be armed for recording.

ISOs for inputs 1-6 can be sent to both pre- and post- fade, while ISOs for inputs 7-12 are routed post-fade only. X1 and X2 can record any combination of channels post-fade, but channels 1 and 6 may also be routed pre-fade.

L and R tracks (Armed)

Armed ISO track

Unarmed ISO track
Powered off input
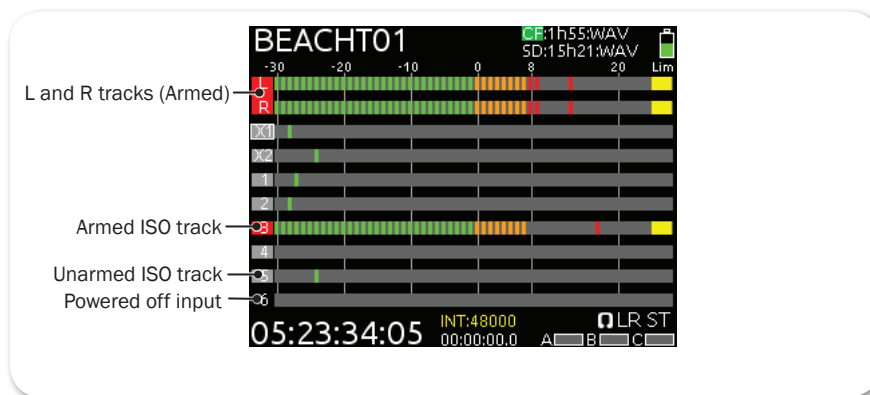
To arm or disarm a track for recording:

1. Press the METERS button repeatedly until the chosen track is visible on the

Main screen.

2. Turn the SELECT encoder to move the white highlight to the chosen track.

3. METERS + SELECT: Press the METERS button and SELECT encoder together. The background color changes to indicate the track's armed status.
Red = armed, Grey = unarmed, and Black = input powered off.

Accessing Recorder Settings

The Main menu has a sub-menu of settings related to recording. These may be used to customize the configuration of the 664's Record settings.

To access the Recorder sub-menu:

1. Press the MENU button

2. Turn and press the Headphone encoder to select RECORDER.

SUB-MENU	DESCRIPTION	OPTIONS
Record to CF	Sets the type of file and which tracks to record to the CF card. The default is Wav Poly.	• Off • Wav Poly • Wav Poly (ISOs Only) • Wav Poly (LR Only) • Wav Poly (X1X2 only) • MP3 (LR) • MP3 (X1X2) • Wav Mono • Wav Mono (ISOs only)
Record to SD	Sets the type of file and which tracks to record to the SD card. The default is Wav Poly.	• Off • Wav Poly • Wav Poly (ISOs Only) • Wav Poly (LR Only) • Wav Poly (X1X2 only) • MP3 (LR) • MP3 (X1X2) • Wav Mono • Wav Mono (ISOs only)
ⓘ	*When a CL-12 is in use and both media are set to Wav Mono, the following message will appear when the REC button is pressed to begin recording.* *"When CL-12 is in use, it is highly recommended to record monophonic files to only one card. Set one card to polyphonic and the other to monophonic."*	
MP3 Bit Rate	The bit rate of recorded MP3 files. The default is 320kbs.	• 320kbs • 192kbs • 128kbs
Sample Rate	The internal sample rate and sample rate of recorded WAV files. The default is 48k.	• 44.1k • 47.952k • 47.952kF • 48k • 48.048k • 48.048kF
Bit Depth	The bit depth of recorded WAV files. The default is 24.	• 24 • 16

Sub-menu	Description	Options
Pre-roll Time	Adjust the amount of record time to be appended before each recording. Maximum value is 3 seconds when recording WAV Mono files to any media. The default is 0 seconds.	• 0 - 6 seconds (1s increment)
Approved Media List	Displays a QR code, which may be scanned to view the list from a web page on the Sound Devices website. For more information, see *Viewing Approved Media List via Smart Phone*.	

Setting File Type and Media Track Assignment

The 664 supports simultaneous recording to CF and SD media. By default, all armed tracks are recorded to both cards as a polyphonic WAV file. It is possible to record only the armed ISO tracks, only the armed L and R tracks, or only the armed X1 and X2 tracks to either media.

To set file type and track routing:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select either of the following:
   ◦ RECORDER > Record to CF
   ◦ RECORDER > Record to SD

3. Turn and press the Headphone encoder to choose a file type and track assignment for the chosen media. For more information, see *Accessing Recorder Settings*.

WAV (Broadcast WAV)

The 664 writes AES-31 broadcast WAV formatted files. The audio files created by the 664 include additional metadata in the file's header, Broadcast Audio Extension (BEXT) and iXML data chunks. Software that does not recognize these additional broadcast WAV data chunks will ignore them. For more information, see *Metadata Overview*.

MP3

MPEG-1 Layer III is a lossy compression algorithm, often used for music and transcription recording purposes. The 664 records two-channel MP3 audio files with data rates of 128, 192, and 320 kbs. For more information, see *Changing the MP3 Bit Rate*.

ⓘ *MP3 recording is only possible when RECORDER > Sample Rate is set to 44.1k or 48k.*

Changing the MP3 Bit Rate

The 664 records MP3 files at a default bit rate of 320kbs, but that bit rate may be changed. A high bit rate MP3 file preserves more audio information with an increased file size. A low bit rate MP3 file preserves less audio information with a decreased file size.

To change the MP3 bit rate:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select RECORDER > MP3 Bit Rate.
3. Turn and press the Headphone encoder to select a bit rate. Options include: 128, 192, and 320 kbs.

Setting the Sample Rate

The 664 records WAV files at 48 kHz sample rate by default.

To set sample rate:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select RECORDER > Sample Rate.
3. Turn and press the Headphone encoder to select a sample rate. Options include: 44.1k, 47.952k, 47.952kF, 48k, 48.048k, 48.048kF.

    The sample rate value is stored in file metadata. Those options with "F" are F mode rates. The F stands for "faux" or "Fostex".

F Sample Modes

The 48.048kF mode is used in specific work flows with Avid®, Final Cut Pro®, and other post-production environments that do not recognize audio files written at 48.048 kHz. In this mode files are recorded at a 48.048 kHz sampling rate but are stamped at 48 kHz. When played, they will play back 0.1% slower than real time.

One use for the 48.048kF mode is to force a 0.1% speed reduction (pull down) of audio to match MOS-telecined film (24 fps-to-NTSC) in non-linear edit systems, such as Avid or Final Cut Pro. Since the file is stamped as a 48 kHz file, the edit system will play it back at 48 kHz and not at 48.048 kHz. This "audio pull down" will match the transferred picture without the need for an intermediate step through other software to create the pull down.

When using 48.048kF sample rate, set main menu option TIMECODE > Frame Rate to 30ND or 24. When set to 30ND, files will be stamped with a frame rate of 29.97. When set to 24, files will be stamped with a frame rate of 23.97ND.

Both 47.952 and 47.952kF settings use a record sampling rate of 47.952 kHz, 0.1% lower than 48 kHz. The 47.952kF mode, however, identifies the file as being recorded at 48 kHz.

When using 47.952kF sample rate, set main menu option TIMECODE > Frame Rate to 23.97ND or 29.97ND. When set to 23.97ND, files will be stamped with a frame rate of 24. When set to 29.97ND, files will be stamped with a frame rate of 30ND.

ⓘ *MP3 recording is not allowed in "F mode".*

Setting the Bit Depth

The 664 records 24 bit WAV files by default. Bit depth defines the digital word length used to represent a given sample and correlates to the maximum dynamic range that is represented by the digital signal. Larger bit depths accommodate a wide dynamic range.

To set bit depth:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select RECORDER > Bit Depth.
3. Turn and press the Headphone encoder to select 24 or 16.

ⓘ *The bit depth value is stored in file metadata.*

Setting the Pre-Roll

Pre-roll buffering is available on the 664 to help prevent missing record cues or up-cutting takes. By default, the pre-roll time is 0 seconds (off). When active, pre-roll begins recording at a set number of seconds preceding the record button being pressed.

To set pre-roll time:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select RECORDER > Pre-roll Time.
3. Turn and press the Headphone encoder to select a value (0 s to 6 s).

ⓘ *While a pre-roll time may be set regardless of the timecode mode, pre-roll is ignored whenever timecode mode is set to Record Run. Additionally, when the mixer's timecode mode is set to either External Timecode Auto Record, or External Timecode Continuous Auto Record, pre-roll is only applied within the Hold Off period and never before receiving rolling timecode value from the master external timecode source. This prevents possible overlapping timecode numbers between adjacent files. For more information, see Setting the Timecode Mode and Setting Timecode Hold Off.*

    ⓘ   *Maximum pre-roll time is 3 seconds when recording mono WAV files to any media. In all other cases, maximum pre-roll time is 6 seconds.*

Using the Slate Microphone

The 664's built-in slate and external microphone is used to notate scenes from the mixer location. Its audio performance is not suitable for critical recording applications. It should be used for documenting scenes and for communication purposes only.

To use the slate microphone:

1. Slide the MIC/TONE switch left to activate the slate mic. The Slate/Tone LED illuminates green to indicate the slate mic is active.

2. Slide the MIC/TONE switch left again to deactivate the slate mic.

    ⓘ   *By default, the slate mic is routed to all tracks and outputs. The gain of the slate mic can be adjusted and an external mic can be used optionally. For details, see Comms and Returns.*

Playing Back Active Takes

Playback may be initiated at any time except when the 664 is recording. Unless playback is initiated from the Take List or File List, the active take will be played from the current playback card. The active take is whichever take was record-ed or played most recently. The active take is displayed at the top of the Main screen.
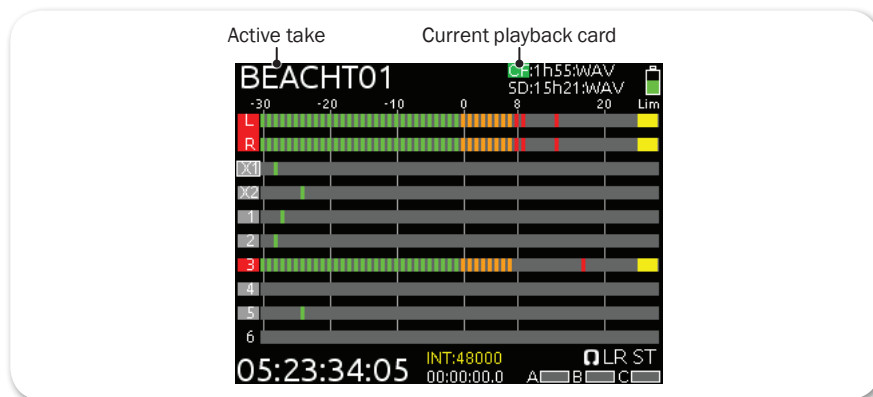
To play back the active take:

▶   Push the Transport control down in any view beside the File List or Take List.

▶   To play back a specific file from the Take List or File List, push the Transport control down while a file is highlighted in one of those views. For details, see *Take List Overview* and *Accessing the File List*.

To toggle playback to a different media card:

▶ HP + Play: Press and hold the Headphone encoder, then push the Transport control downward (Play)

Viewing Approved Media List via Smart Phone

The 664 provides QR codes on screen for smart phone access to product-related documentation, including the Approved Media List, available online.

ⓘ *Accessing documentation via a QR code requires the installation on your smart phone of a code reader application—many of which are available as free downloads from App stores.*

To access the Approved Media List via QR code:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select RECORDER > Approved Media List.
3. Using your phone's code reader application, scan the QR code to access the Approved Media List, which is a web page on the Sound Devices website.

Comms and Returns

The 664 provides Sound Mixers with three stereo returns for monitoring camera audio and to ensure quality audio is being sent to the camera.

Sound Mixers can also utilize an external slate mic or the 664's built-in slate mic for an "all call" (Slate) to any of the 664's outputs or record tracks. The slate mic can also be used to send private communications (Comms).

This section discusses the flexible options and setup of the returns and communication systems.

Topics in this section include:

▸ **Overview of Slate Mic**
▸ **Setting up an External Slate Microphone**
▸ **Setting External Slate Mic Gain**
▸ **Monitoring Returns**
▸ **Setting up COM Send Program**
▸ **Using the Slate Mic for Notation**
▸ **Private Communications**
  ▸ Activating Comms
  ▸ Monitoring COM RTN
▸ **Comms / Returns Settings**
▸ **Adjusting Com Return Gain**
▸ **Adjusting Comms Muting Behavior**
▸ **Setting MIC/TONE and A B/C Switches**

Overview of Slate Mic

The slate microphone can be used to audibly identify a scene or slate at the start of recording or communicate with other members of the production crew. The 664 incorporates a built-in slate mic and a TA3 connector for an external slate mic. The built-in mic is the default. Its audio performance is not suitable for critical recording applications; it should be used for documenting scenes and for communication purposes only. Use an external slate mic when higher quality communications are required.

Setting up an External Slate Microphone

An external microphone can be used instead of the built-in microphone.

To set up an external slate microphone:

1. Connect the microphone to the SLATE MIC IN TA3 connector on the left panel.

2. Press the MENU button.

3. Turn and press the Headphone encoder to select COMMS/RETURNS > Slate/Com Mic Source.

4. Turn and press the Headphone encoder to select Ext Mic (for dynamic mi-

crophones) or Ext 12V Mic (for condenser microphones). When the Slate or Com function is active, the 664 will use this microphone.

Setting External Slate Mic Gain

The gain of the slate mic is 36 dB by default. When using an external microphone as the slate mic, however, this gain can be adjusted:

To adjust external slate microphone gain:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select COMMS/RETURNS > Ext Slate/Com Mic Gain.
3. Turn the Headphone encoder to adjust slate microphone gain (0 dB - 36 dB).

ⓘ *For quick adjustment of external slate microphone gain, slide the MIC/TONE switch to the left and hold while turning the Headphone encoder. This shortcut only applies to the slate mic when the slate mic source is set to one of its external mic options; if not, this shortcut adjusts headphone gain.*

Monitoring Returns

The 664 is equipped with three stereo returns (RTN A, B, C) for monitoring camera audio. RTN audio levels can be metered and quickly monitored on the 664 headphone output with a toggle of the A B/C switch. For more information about metering RTN input signals, see *Meter Views*.

The following procedure describes default behavior of the A B/C switch; however, it may be modified to behave differently. See *Setting MIC/TONE and A B/C Switches* for more information.

To monitor RTNs, do any of the following:

▶ Slide the A B/C switch left for RTN A. Slide again to return to original headphone source.

▶ Slide the A B/C switch right for RTN B. Slide again to return to original headphone source.

▶ Press in and hold the Select encoder and slide the A B/C switch right for RTN C. Repeat to return to original headphone source.

ⓘ *RTN monitoring will cancel PFL mix program when activated.*

Setting up COM Send Program

By default, the L and R stereo bus is sent to the COM Send output, a TA3 connector located on the back of the 664. However, a different program may be routed to the output instead.

To change the program going to the COM Send output:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select COMMS/RETURNS > Com Send Program. The Com Send Program screen is displayed.
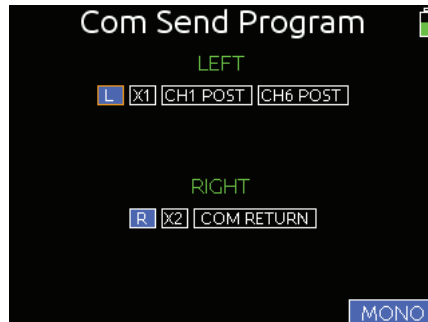
3. Turn the Headphone encoder to scroll the orange highlight through source options. Options for the left side differ from what is available for the right side of COM Send.

4. Press in the encoder to change the selected source between Off (black) and On (blue).

5. (Optional) Slide the A B/C switch right to toggle mono or stereo COM Send.

For more information, see also *Private Communications* and *Adjusting Comms Muting Behavior*.

Using the Slate Mic for Notation

On the 664, the slate mic signal is routed to all outputs and tracks, and all programs routed to them are muted when slate is activated.

The following procedures describe default behavior of the MIC/TONE switch; however, it may be modified to behave differently. See *Setting MIC/TONE and A B/C Switches* for more information.

To activate the slate function momentarily:

1. Slide and hold the MIC/TONE switch left. The slate mic activates, the Slate/Tone LED illuminates green, and the headphone monitor source changes to SLATE when slate is active.

2. Release the MIC/TONE switch. The slate mic deactivates, the Slate/Tone LED turns off, and the headphone monitor reverts to its previous source.

To lock the slate function on:

1. Slide the MIC/TONE switch left. The slate mic activates, the Slate/Tone LED illuminates green, and the headphone monitor source changes to SLATE.

2. Slide the MIC/TONE switch left again. The slate mic deactivates, the Slate/Tone LED turns off, and the headphone monitor reverts to its previous source.

Private Communications

The 664 features an unbalanced stereo COM Send output (TA3 connector) and a balanced mono COM RTN input (TA3 connector)—both on the back panel—for private communication between the 664 operator and other members of the production crew. The most common use of comms is for the sound mixer to communicate directly with the boom operator. The same mic used for slate is also used to send comms.

Activating Comms

On the 664, comms are sent to the COM Send output and right headphone output, but not to any other outputs.

ⓘ *Comms will never go to record tracks or affect recordings.*

The following procedures describe default behavior of the MIC/TONE switch; however, it may be modified to behave differently. See *Setting MIC/TONE and A B/C Switches* for more information.

To activate private comms momentarily:

1. SELECT + MIC: Press and hold the SELECT encoder while sliding and holding the MIC/TONE switch left. The slate mic activates, and the Slate/Tone LED illuminates green.

2. Release the MIC/TONE switch. The slate mic deactivates, and the Slate/Tone LED turns off.

To lock Comms on:

1. SELECT + MIC: Press and hold the SELECT encoder while sliding the MIC/TONE switch left. The slate mic activates, and the Slate/Tone LED illuminates green.

2. Slide the MIC/TONE switch left again. The slate mic deactivates and the Slate/Tone LED turns off.

Monitoring COM RTN

The COM RTN allows the Sound Mixer to hear communication back from other members of the production crew, such as the boom operator. The COM RTN signal can be quickly heard in headphones by using the assigned A B/C toggle action or by assigning it to a custom HP preset. For two-way communication, activate private comms (COM Send) and COM RTN at the same time.

The following procedure describes default behavior of the A B/C switch; however, it may be modified to behave differently. See *Setting MIC/TONE and A B/C Switches* for more information.

To monitor COM RTN:

1. SELECT + A: Press and hold the SELECT encoder while sliding the A B/C switch left. The headphone monitor source changes to COM RTN.

2. When finished, slide the A B/C switch right to return to the selected monitor source.

Comms / Returns Settings

The 664 has a COMMS/RETURNS menu to allow for various setting adjustments. Most of these settings are described in greater detail in other sections of this guide, where applicable. The menu's entire sub-menu listing and options are provided in the following reference table as a convenience.

SUB-MENU	DESCRIPTION	OPTIONS
Slate/Com Mic Source	Select internal or external slate microphone. Use Ext 12V setting for external condenser microphones.	• OFF • Int Mic • Ext Mic • Ext 12V Mic
Ext Slate/Com Mic Gain	Sets the input gain for external slate microphone.	• 0-36 dB (1 dB increment)
Com Send Program	Displays the Com Send Program screen where sources may be chosen for right and left channel of the COM Send.	
Com Send Gain	Sets the gain of the COM Send output.	• 0-48 dB (1 dB increment)
Com Return Gain	Sets the gain of the COM RTN input.	• 0-24 dB (1 dB increment)
COM Mutes Output Program	Toggle automatic muting of COM Program when COM is activated.	• Yes • No
MIC Toggle Switch	Selects the left action of MIC/TONE switch (primary) and the action of the Select + MIC/TONE switch (secondary function)	• Slate/Com • Com/Slate
RTN Toggle Left	Selects the left action of A B/C switch (primary) and the left action of the Select + A B/C switch (secondary function)	• RTN A/COM RTN • COM RTN/RTN A

Sub-menu	Description	Options
RTN Toggle Right	Selects the right action of A B/C switch (primary) and the right action of the Select + A B/C switch (secondary function)	• RTN B/C • RTN C/B

Adjusting Com Return Gain

By default, the gain of the COM RTN input is 0 dB. This can be adjusted from 0 to 24 dB in 1 dB increments.

To adjust com return gain:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select COMMS/RETURNS > Com Return Gain.

3. Turn the Headphone encoder to adjust the Com Return gain (0 dB to 24 dB).

4. Press the Headphone encoder to accept the value.

Adjusting Comms Muting Behavior

By default, the program routed to the COM Send output is muted when private comms are activated. This helps the boom operator, for instance, hear the voice of the 664 operator.

This muting behavior can be changed, however, so that all sources sent to COM Send are mixed together.

To adjust comms muting behavior:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select COMMS/RETURNS > COM Mutes Output Program.

3. Turn the Headphone encoder to set the value to Yes or No.

4. Press the Headphone encoder to accept the value.

COMMS AND RETURNS

Setting MIC/TONE and A B/C Switches

The primary and secondary actions of the MIC/TONE switch and the A B/C switch may be altered to fit the needs of the specific workflow. The primary actions are those that occur when the switch alone is used. Secondary actions are those when the SELECT encoder is used in combination with the switch.

The following table displays the default action for each switch and switch combination, as well as available options for each.

Switch	Default Action	Available Actions
MIC (left)	Slate	• Slate • Com
SELECT + MIC (left)	Com	• Slate • Com
A (left)	RTN A	• RTN A • Com RTN
SELECT + A (left)	Com RTN	• RTN A • Com RTN
B/C (right)	RTN B	• RTN B • RTN C
SELECT+ B/C (right)	RTN C	• RTN B • RTN C

To modify switch actions:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select any of the following:
   ◦ COMMS/RETURNS > MIC Toggle Switch (MIC/TONE left)
   ◦ COMMS/RETURNS > RTN Toggle Left (A B/C left)
   ◦ COMMS/RETURNS > RTN Toggle Right (A B/C right)

3. Turn and press the Headphone encoder to select an option for the chosen switch. Primary actions are listed first in each option with secondary actions following a slash, such as Slate/Com or Com/Slate.

Timecode and Sync

The 664 features a fully-integrated Ambient™ timecode generator and reader that supports all common rates and modes. The 664 holds accurate timecode for up to two hours after shutdown, using an internal, Lithium-Ion timecode battery. This timecode battery is charged whenever the 664 is powered on or by plugging the 664's USB connector into a USB power source.

ⓘ *After two hours without power, the 664 reverts to a slightly less-precise time-of-day crystal to maintain the date and time on the device.*

Word Clock connectors on the back panel allow the 664 to be sample synchronized with other digital audio equipment in the work flow.

Topics in this section include:

‣ **Timecode**
  ‣ Setting the Timecode Mode
  ‣ Setting the Frame Rate
  ‣ Setting Timecode Hold Off
  ‣ Jamming the Timecode
  ‣ Setting the Timecode Generator
  ‣ Setting User Bits
  ‣ Setting Display Mode
‣ **Synchronizing the Word Clock**
  ‣ Setting Word Clock Sensitivity

Timecode

File-based recorders place a timecode and frame rate stamp in the BEXT and iXML chunks of an AES31 broadcast WAV file. During playback, the mixer generates SMPTE timecode from this number and extrapolates it based on the timecode frame rate. All files generated by the mixer have timecode numbers that begin on the 0 frame (or 02 in DF modes) and end on the 0 frame such that a file's duration is always an integer number of seconds long. If necessary, pre-roll and post-roll is dynamically applied to accomplish this, simplifying synchronization in post-production. The timecode value and frame rate of the 664 are displayed on the Main screen.

Timecode

Frame rate or sample rate
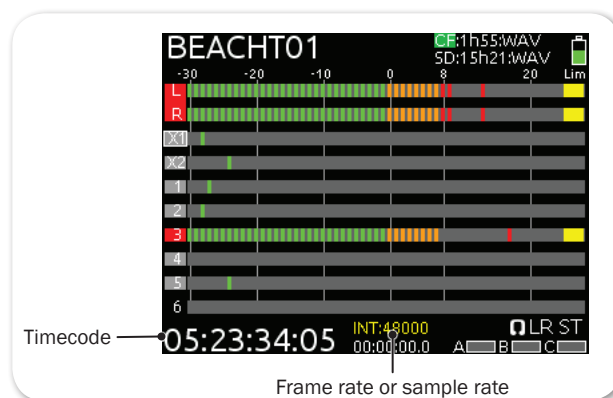
ⓘ *If sample rate is displayed–as shown–instead of the frame rate, toggle the view to frame rate by holding METERS down and slide the A B/C switch to the left.*

Setting the Timecode Mode

The Timecode mode determines if the mixer generates or reads timecode from an external source, and when timecode runs and stops.

To set the Timecode mode:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select TIMECODE/SYNC > Timecode Mode.
3. Select a mode. Options include:

OPTIONS	MODE TYPE	DESCRIPTION
Off	N/A	Turns timecode mode off.
Rec Run	Generator	Timecode runs while recording and is stationary when not recording. In this mode, timecode defaults to the last stationary value at power-up. When switching to Record Run from another mode, the internal generator will stop at the last timecode value.
Free Run	Generator	Timecode runs continuously. Timecode continues counting for up to two hours after power-down.
Free Run Auto Mute	Generator	Timecode runs continuously; however, timecode output is muted during standby. This is useful for triggering external devices when in free run timecode workflows.
Free Run Jam Once	Generator	Allows the mixer to automatically jam to an external valid timecode source when first connected. Once jammed, the mixer will retain the timecode count even when disconnected from external source and for up to two hours after the mixer is powered down.
24h Run	Generator	Timecode runs continuously with its value based on the mixer's time and date settings. This is useful for workflows requiring timecode be referenced to the Actual Time clock.
24h Run Auto Mute	Generator	Timecode runs continuously with its value based on mixer's time and date settings; however, timecode output is muted during standby.
Ext-TC	Reader	Timecode is derived from external timecode sources.
Ext-TC Auto-Rec	Reader	Timecode is based on external timecode sources, and allows recording on the 664 to be triggered via external timecode starting and stopping.
Ext-TC/Cont	Reader/ Generator	Timecode is based on external timecode sources. If timecode is disconnected, the 664 continues counting from the same value, using its internal timecode generator. This is useful when working with wireless timecode sources, allowing the mixer to free-wheel through wireless dropouts.

OPTIONS	MODE TYPE	DESCRIPTION
Ext-TC Auto-Rec/Cont	Reader/ Generator	Timecode is based on external timecode sources, and allows recording on the 664 to be triggered via external timecode starting and stopping. Also, if timecode is disconnected, the 664 continues counting from the same value, using its internal timecode generator. This is useful when working with wireless timecode sources, allowing the mixer to free-wheel through wireless dropouts. In the event of a dropout, the 664 will stop recording when it receives a stationary value.

Setting the Frame Rate

By default, the 664's frame rate for the timecode generator is set to 30nd.

ⓘ *The frame rate value is stored in the Frame Rate field of metadata.*

When using an external timecode mode, ensure the mixer's frame rate is equal to (or cross-jam compatible to) the external frame rate.

To set frame rate for the timecode generator:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select TIMECODE/SYNC > Frame Rate. Options include: 23.98, 24, 25, 29.97nd, 29.97df, 30nd and 30df.

Setting Timecode Hold Off

Some devices that send Rec-Run timecode will have a tendency to occasionally send short bursts of running or invalid timecode. When using these devices as an external timecode to trigger recording, this behavior can result in unintentional recordings or invalid timecode stamps on the mixer. To prevent this, the 664 features a Timecode Hold Off function.

This feature only applies when in Ext-TC Auto-Rec and Ext-TC Auto-Rec/Cont timecode modes.

When using these external timecode auto-record modes, the 664 will delay the start of recording for a specified "hold" time. Running timecode that lasts for less than the Hold Off value will not trigger a recording on the 664.

To set up Timecode Hold Off:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select TIMECODE/SYNC > Hold Off.
3. Specify the hold time in 0.1 second intervals. Options include: 0.0 s - 8.0 s.

ⓘ *If a pre-roll time is set, it will be applied. Pre-roll will only capture audio from the initial detection of a timecode signal. If no pre-roll is selected, the file will begin after the Hold Off period expires. It is best practice to set pre-roll to a value greater than the specified Hold Off value. This ensures that audio is captured from the moment a timecode signal is detected and that unintentional files triggered by short bursts of timecode are not generated.*
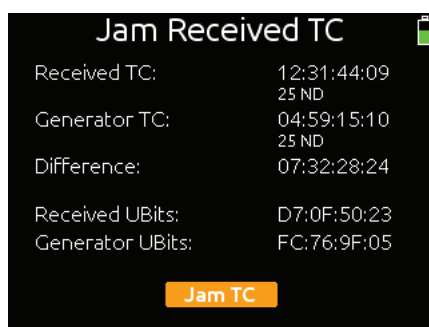
Jamming the Timecode

The Jam Received TC screen (better known as the Timecode Jam menu) displays detailed information about the mixer's internal SMPTE timecode generator and SMPTE timecode present on the mixer's timecode input. It also features a button allowing you to jam the timecode if necessary.

If the mixer's time and date are reset during the production day, or if the Timecode mode is changed from 24h Run to another mode and back, the timecode value will change. To ensure proper synchronization, you must re-jam all timecode devices.

To access the Timecode Jam menu, do one of the following:

▶ Press METERS + MIC.

▶ Press MENU, and then use the Headphone encoder to select TIMECODE/SYNC > Jam Menu.

To manually jam the timecode:

▶ From the Timecode Jam menu, press the Headphone encoder.

To exit the Timecode Jam menu without jamming:

▶ Press either the MENU or METERS button.

Setting the Timecode Generator

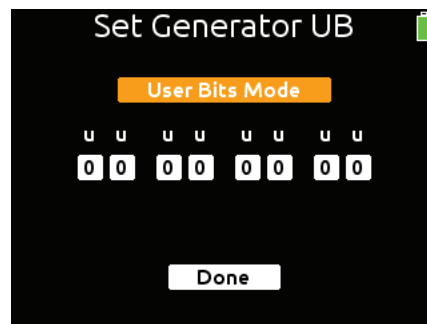Timecode values may also be manually set.

To set the timecode generator:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select TIMECODE/SYNC > Set Generator TC.

   The Set Generator TC screen appears with four fields representing hours (HH), minutes (MM), seconds (SS), and frames (FF).

3. Navigate the screen's fields by doing the following:
   ▶ Turn the encoder to move orange highlight from one field to the next.
   ▶ Press the encoder to select a field. Chosen fields appear blue.

4. Turn and press the encoder to change each field's value.

5. When finished with your edits, turn the encoder to highlight Done and press the encoder to save your new timecode value.

Setting User Bits

By default, you may customize the user bits with a four-field format, delineated by colons, such as UU:UU:UU:UU, where U represented a user-definable value.

Often, the first three fields in the format are manually reset daily using two-digit numerical values for the date, such as MM:DD:YY:UU or DD:MM:YY:UU.

The User Bits mode lets you configure the device to automatically populate the first three fields with values derived from the system's date.

A fourth mode allows user bits to be derived from an external source. If that mode is to be used, ensure the external source for timecode user bits is attached to the 664 via the 5-pin LEMO connector on the mixer's right panel before setting the mode.

To set User Bits mode:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select TIMECODE/SYNC > Set Generator UBits.

3. Press the encoder again to select one of four mode options:
   ◦ UU:UU:UU:UU — four, two-digit, user-definable fields (the default)
   ◦ MM:DD:YY:UU — first three two-digit fields represent month, day, year
   ◦ DD:MM:YY:UU — first three two-digit fields represent day, month, year
   ◦ Use External — After the values are received from the external source, it may be disconnected from the mixer. The 664 will retain those values for

up to two hours after power down.

ⓘ *When set to MM:DD:YY:UU or DD:MM:YY:UU, the system will populate the first three fields, so those fields will appear grayed out in the Set Generator UB screen, leaving only the last field (UU) to be customized by the user. When set to Use External, the fields appear grayed out and the field labels change from UU to XX.*

Setting Display Mode

By default, the timecode is displayed as the largest clock on the screen in meter views. However, you may reverse the positioning of the timecode and absolute time clocks on all meter views so that the one you deem most important is larger.

Timecode — 05:23:34:05
Absolute Time
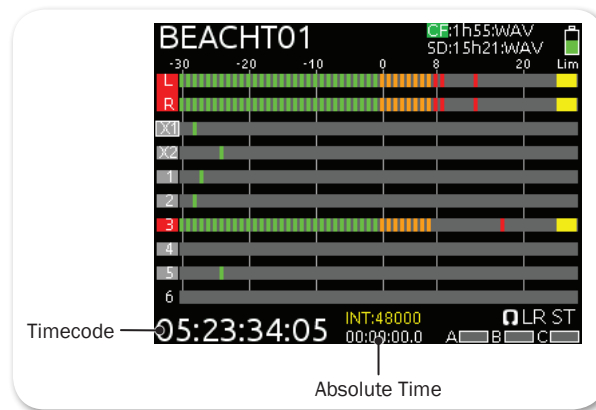
To reverse the clock display:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select TIMECODE/SYNC > Display Mode. Options include:

OPTIONS	DESCRIPTION
Big A-time	Displays absolute time as the larger clock in all Meter Views.
Big Timecode	Displays the timecode as the larger clock in all Meter Views.

Synchronizing the Word Clock

A stable sample clock source is essential for high quality digital audio. Setups involving multiple digital recording/playback devices often require that all devices are locked to a common clock reference to ensure synchronicity—that all run at the same speed and remain in phase with one another.

By default, the 664 uses its own internal clock to generate its sampling rate. However, the Word Clock BNC input connection on the back panel may be used to clock from an external signal. The 664 internal word clock may also be used as clock master by connecting its output connection to external audio devices.

ⓘ *The 664 accepts word clock signals at 44.1, 47.0952, 48, and 48.048 kHz.*

To synchronize to an external word clock signal:

1. Connect the word clock signal to the BNC input on the 664's back panel.

2. Press the MENU button.

3. Turn and press the Headphone encoder to select TIMECODE/SYNC > Sync Reference.

4.

5. Set the sync reference to Word Clock.

When the 664 is locked to external word clock, it is indicated by WCK in yellow text at the bottom of the Main screen.

Wordclock value
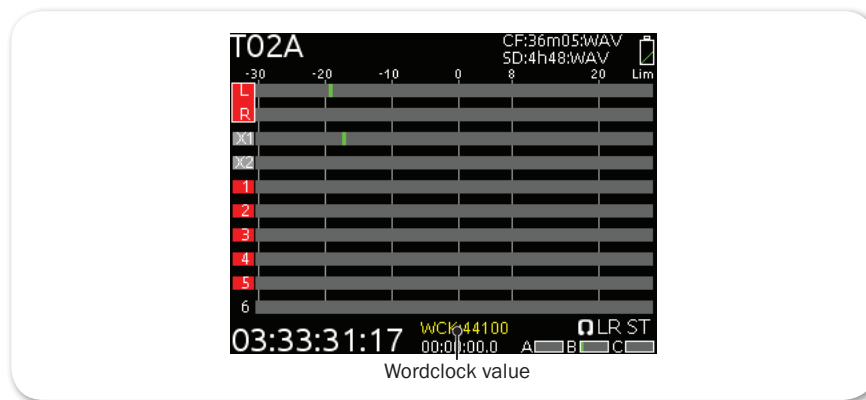
If no valid external word clock is present, the word UNLOCK blinks yellow and red on the Main screen.

ⓘ *During playback, the 664 ignores any external word clock source and only uses its own internal word clock.*

Setting Word Clock Sensitivity

A menu option is available on the 664 letting you adjust the sensitivity of the word clock input to allow the mixer to work with word clock sources of lower voltage amplitude.

To set the sensitivity:

1. Press the MENU button.

2. Select the Timecode/Sync > Word Clock Sensitivity. Options include: High (no termination) or Low (75 ohm termination). By default, sensitivity is set to High.

File Storage

The 664 has multiple options for file management of the SD and CF cards.

Storage media must be formatted prior to use with the mixer.

In this chapter we discuss the file and folder structure, copying files from one media to another, transferring files from the CF or SD card to a computer, formatting media and generating CSV Sound Reports directly from the 664 interface.

Topics in this section include:

▸ **File Structure**
▸ **Transferring Files to PC**
▸ **Take List and File List**
  ▸ Accessing the File List
  ▸ Deleting Files or Folders
▸ **File Storage Settings**
▸ **Setting Folder Options**
▸ **Generating Sound Reports**
▸ **Changing the Take Designator**
▸ **Defining File Max Size**
▸ **Setting Scene Increment Mode**
▸ **Setting Take Reset Mode**
▸ **Setting File Playback Mode**
▸ **Selecting a Default Playback Card**
▸ **Erasing / Formatting Media**

File Structure

The 664 records polyphonic or monophonic audio files. Polyphonic recordings have multiple audio tracks within a single file. Monophonic recordings have a file for each audio track.

Polyphonic file names consist of a scene name, take number, and a file extension:

S01T01.WAV

scene number | extension
take number
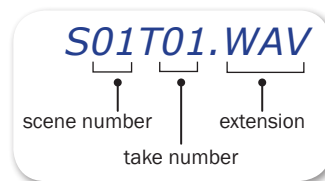
Monophonic file names consist of a scene name, take number, mono track designator, and a file extension:

S01T01_3.WAV

scene number | extension
take number
track designator
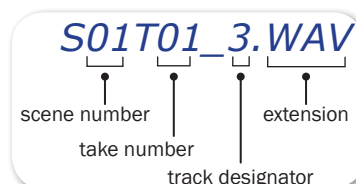
The track designators are associated with the 664 tracks. This differs from track names which may be edited and are covered in depth in the Metadata section of this guide.

This table illustrates the association between 664 tracks, track names, and track designators.

TRACK	TRACK NAME	TRACK DESIGNATOR
Track L	MixL	1
Track R	MixR	2
Track 1	Ch1	3
Track 2	Ch2	4
Track 3	Ch3	5
Track 4	Ch4	6
Track 5	Ch5	7
Track 6	Ch6	8
Track 7	Ch7	9
Track 8	Ch8	A
Track 9	Ch9	B
Track 10	Ch10	C
Track 11	Ch11	D
Track 12	Ch12	E
Track X1	Aux1	F
Track X2	Aux2	G

Transferring Files to PC

When finished recording, and the media remaining time on the Main screen is white, you may remove the SD or CF card(s) from the 664 and mount them to any computer and transfer your recorded files using a card reader or card slot.

To remove the SD card:

1. Open the Media Door.
2. Push it in to release the card, and then pull it out.

To remove the CF card:

▶ Open the Media Door and pull out the card.

To transfer files:

1. Mount your memory card to your computer.
2. Copy the files from the card to the computer.

ⓘ *Sound Devices recommends that you copy files first before editing files on the computer. Do not edit files directly from the memory cards.*

Take List and File List

A file is an individual file stored on attached media. A take is a single recording that can consist of multiple files on one or both media. The Take List displays a list of takes and provides functions for deleting, renaming, and editing information in metadata fields. Edits made in the Take List will be applied to both SD and CF cards, if applicable. For details on the Take List, see *Take List Overview*.

Accessing the File List

The File List displays files and folders on a chosen media and provides functions for deleting files or folders, copying files or folders to other media, renaming folders, creating sound reports, formatting media, and emptying Trash and False Take folders. The File List functions only apply to the chosen media.

To access the File List:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select FILE STORAGE > File List.

ⓘ *An alternative way to access the File List is by sliding the MIC/TONE switch while the Take List screen is displayed. That switch acts as a toggle between the File List and Take List screens.*

The first screen displays each media and general information along with menu options.

3. Slide the A B/C switch to access options for the card. Options include:
   ◦ Create Sound Report
   ◦ Copy to other card
   ◦ Rename
   ◦ Empty Trash
   ◦ Erase/Format

   If necessary, to return to the Card screen, press MENU.

4. Turn and press the Headphone encoder to select CF or SD and view its contents. A list of files on that card will be displayed. Folder names are preceded by a slash ("\").

File list of SD root   File list within a folder (named "Dune")
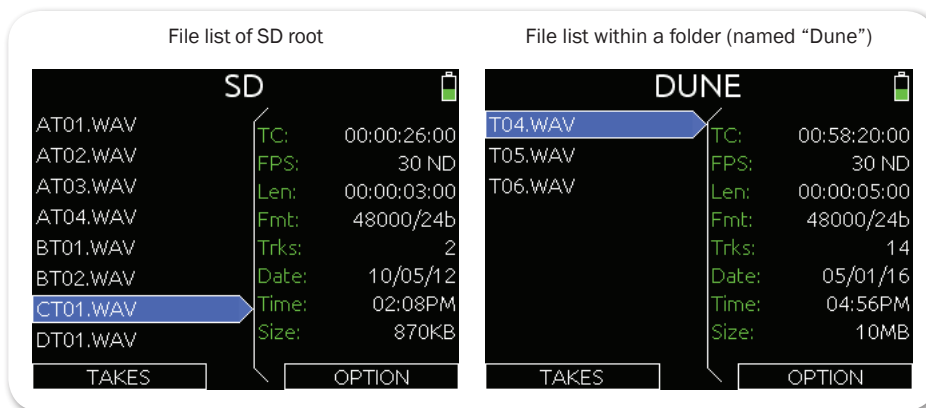
5. Turn the Headphone encoder to highlight a chosen file or folder. Information pertaining to your selection appears on the right.

6. Slide the A B/C switch to access options. The OPTION menu will vary depending on the file or folder selected.

   Folder options include:
   ◦ Create Sound Report
   ◦ Empty Folder (Trash and False Takes folders only)
   ◦ Copy Directory to other card
   ◦ Rename Folder
   ◦ Delete folder from chosen card

   File options include:
   ◦ Copy file to the other card
   ◦ Delete file from chosen media

Deleting Files or Folders

Files and folders may be deleted from the File List.

ⓘ *File deletion applies only to the chosen media. To delete all files associated with a take, use the Take List.*

To delete a file or folder:

1. From the File List, turn and press the Headphone encoder to select CF or SD. A list of files on that card will be displayed.

2. Turn the Headphone encoder to highlight the chosen file or folder.

3. Slide the A B/C switch left or right to access options for the highlighted file or folder.

4. Turn and press the Headphone encoder to select Delete.

ⓘ *Delete is not an option when the Trash or False Takes folders are selected.*

5. Press the Headphone encoder to confirm deletion or turn and press the Headphone encoder to cancel deletion.

   Deleted files get moved to the Trash folder of the chosen card.

File Storage Settings

The following table provides the File Storage settings and available options.

Sub-menu	Description	Options
Take List	Accesses the Take List. See *Take List Overview* for more details.	
File List	Accesses the File List.	
Folder Options	Sets options for folder structure with up to three levels of hierarchy.	• Top-Level • Mid-Level • Bottom-Level
Sound Report Info	Enter information to be included in Sound Report headers.	• Project • Producer • Director • Job • Date • Location • Sound Mixer • Phone • E-Mail • Client • Boom Op • Prod. Co. • Prod. Co. Tel. • Mics • Comments • Roll • Media • File Type (CF) • File Type (SD) • Sample Rate • Frame Rate • Bit Depth • Tone Level
File Max Size	Selects the file size at which a recording will close automatically, and then start a new file.	• 4GB • 2GB • 1GB • 640MB • 512MB
Scene Increment Mode	Enables or disabled the scene increment shortcut and selects which format the scene increment will use.	• Disabled • Character • Numeric
Take Reset Mode	Defines when take number is reset.	• Never • Scene Change • Daily Folder Change • Either Scene or Daily
File Playback Mode	Determines what (if any) playback action the 664 will perform upon reaching the end of a file during playback.	• Play Once • Play All • Repeat One • Repeat All
Default Playback Card	The source media that files will be played from when playback is initiated.	• CF • SD

Sub-menu	Description	Options
Erase/Format CF	Formats CF card to FAT32 (32 GB or less) or exFAT (greater than 32 GB) file system.	
Erase/Format SD	Formats SD card to FAT32 (32 GB or less) or exFAT (greater than 32 GB) file system.	

Setting Folder Options

By default, recorded files are written to the root level of the SD and CF card. Three levels of directories can be configured from Main menu option FILE STORAGE > Folder Options. Folder choices include Top-Level, Mid-Level, and Bottom-Level. Folders are created when the record key is pressed.
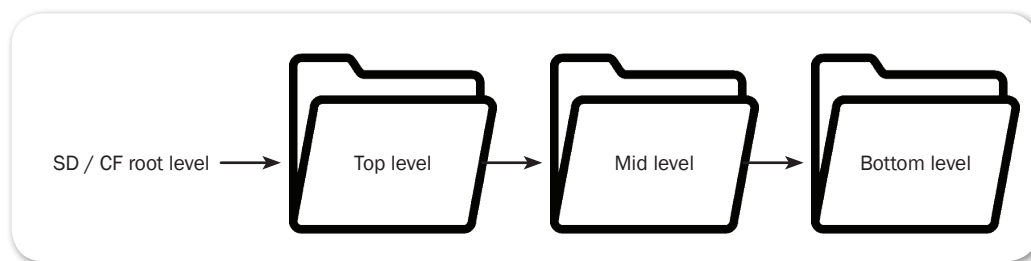
Each folder level has a corresponding list of available names that can be edited manually. When a folder level is manually named, all subsequent recordings will be written to that folder until the Folder option is changed.

To manually set the name of a folder level:

1. Press the MENU button to access the Main menu.

2. Turn and press the Headphone encoder to select FILE STORAGE > Folder Options.

3. Turn and press the Headphone encoder to select a folder level. Options include: Top-level, Mid-level, or Bottom-level.

4. Turn and press the Headphone encoder to select <Add New Entry>.

5. Use the on-screen keyboard (or a USB keyboard, if attached) to enter a value.

6. (Optional) If you mistype while entering a value, slide the A B/C switch left to "backspace" and remove the mistyped text.

7. (Optional) Slide the MIC/TONE switch to toggle between uppercase and lowercase characters, if necessary.

ⓘ *On-screen keys are grayed out for symbols that are not permissible.*

8. Slide the A B/C switch right to accept the new value.

In addition to custom entries, the Mid-level folder may be set to <Daily> and the Bottom-level folder may be set to <Scene>:

- When the Mid-level folder is set to <Daily>, a folder will be created automatically and named according to the date. Whenever a new day occurs, the 664 will prompt the user to confirm the creation of a new daily folder.
- When the Bottom-level folder is set to <Scene>, a new folder will be created each time the scene name is changed.

ⓘ *The top level folder value is stored in the Project field of metadata.*

   The mid level folder value is stored in the Roll (Tape) field of metadata.

Generating Sound Reports

The 664 can generate sound reports as a comma separated values (CSV) file. CSV files can be opened and edited by any common spreadsheet application such as Microsoft® Excel®, OpenOffice™ Calc, Apple® Numbers, Google Docs™, and many more. Ensure the spreadsheet application is set to delineate by comma.

ⓘ *MP3 files are not included in sound reports.*

To define headers for sound reports:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select FILE STORAGE > Sound Report Info. A list of sound report headers appears.
3. Select a header to edit.
4. Do one of the following:
   ▶ Use the Headphone encoder to select an existing item from the list.
   ▶ Use the Headphone encoder to select <Add New Entry>. Then use the on-screen keyboard to enter a new value.

ⓘ *Other options include: <None>, <Current Selection>, and <System Date>.*

Sound reports are generated by folder. All files in the folder are included in the sound report. Files located within sub-folders will not be included in the sound report. For example, if you have a Mid- and Bottom-level folder, you have to create a sound report on the bottom level where the files are located.

To generate a sound report:

1. Access the File List. See *Accessing the File List* for details.
2. Turn the Headphone encoder to highlight the folder in which you would like to generate a sound report.
3. Slide the A B/C switch right to access the options menu for this folder.

4. Turn and press the Headphone encoder to select Create a Sound Report. A .csv file will be created in the folder with a name of: [FOLDER NAME]_REPORT.CSV.

5. When prompted for confirmation, press the Headphone encoder to confirm.

ⓘ *Sound reports may also be initiated from the Wingman app on mixers with the WM-Connect Bluetooth Smart USB accessory. For more information, see Wingman Integration: 6-Series.*

Changing the Take Designator

The default take designator of file names is the capital letter T, but that may be changed to a hyphen or any letter of the alphabet.

To change the take designator:

1. Press MENU.

2. Select FILE STORAGE > Take Designator.

3. Select a new capital letter or a hyphen to be the take designator.

The change will apply to all future files; it does not affect existing files.

Defining File Max Size

By default, the maximum size of WAV files is 4GB. When the max file size is reached, the file is split and a new file is written automatically. This split is seamless and sample-accurate.

To set maximum file size:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select FILE STORAGE > File Max Size.

3. Turn and press the Headphone encoder to set a maximum file size. Options include: 4 GB, 2 GB, 1 GB, 640 MB, and 512 MB.

If longer recording times with less splits are wanted, various options affect this:

• Record mono WAV files rather than poly WAV files. See *Setting File Type and Media Track Assignment* for details.
• Lower the sample rate. See *Setting the Sample Rate* for details.
• Lower the amount of armed tracks (poly only). See *Arming or Disarming Recording Tracks* for details.

Setting Scene Increment Mode

The 664 provides a Scene Increment shortcut, but it is disabled by default. Scene names will not increment unless the Scene Increment mode is enabled. See *Shortcuts* for a description of all time-saving shortcuts.

To enable Scene Increment mode:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select FILE STORAGE > Scene Increment Mode. Options include:

OPTIONS	DESCRIPTION
Disabled	Shortcut is disabled.
Character	When set to Character, and the scene name ends with a letter, the Scene Increment shortcut will change that letter to the next letter of the alphabet. If current scene name does not end in a letter, a letter will be appended.
Numeric	When set to Numeric, and the scene name ends with a number, the Scene Increment shortcut will increment that number to the next numerical value. If current scene name does not end in a number, a number will be appended.

Setting Take Reset Mode

Takes are labeled numerically in the file name, preceded by the letter T, and stored in the metadata of each recorded file. Take labels begin at number 01 and continue to increment by one until they are reset. By default, take numbers reset when a new scene is selected or when a new daily folder is created. This behavior can be modified to only happen when the daily folder changes, only happen when the scene changes, or to never happen.

To set take reset mode:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select FILE STORAGE > Take Reset Mode. Options include: Never, Scene Change, Daily Folder Change, or Either Scene or Daily.

Setting File Playback Mode

When playback is initiated, the selected file will play to the end and then stop—unless, of course, playback is stopped prematurely by manually pressing the Transport control in twice. This default behavior is called Play Once, but it may be modified so that all files in the folder will be played (Play All), the selected file will play in a loop until stopped (Repeat One), or all files in the folder will be played in a loop until manually stopped (Repeat All).

To set file playback mode:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select FILE STORAGE > File Playback Mode. Options include: Play Once, Play All, Repeat One, or Repeat All.

Selecting a Default Playback Card

By default, the CompactFlash memory card is the playback card. If no CF card is present, the SD card will be used. The default playback card is indicated with a green background on the main view:
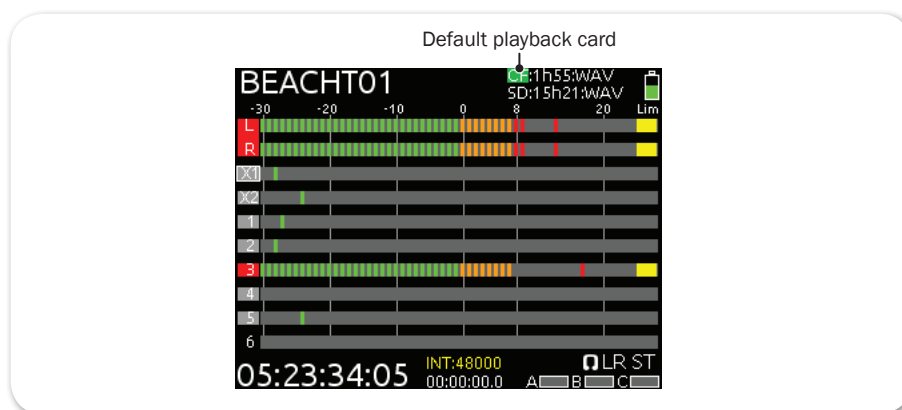
To set the default playback card:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select FILE STORAGE > Default Playback Card. Options include: CF or SD

ⓘ *An alternative way to set the default playback card is to press in and hold the Headphone encoder while pushing down on the Transport control.*

Erasing / Formatting Media

Before recording to CF or SD media, cards must be formatted by the 664.

To format media:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select FILE STORAGE.

3. Do either of the following:
   ▶ Select Erase/Format CF to reformat a CompactFlash card.
   ▶ Select Erase/Format SD to reformat an SD, SDHC, or SDXC card.

4. Press the Headphone encoder to begin the formatting process.

⚠ *Formatting media will erase all data on the card.*

5. Follow the message(s) that appear on screen and press the Headphone encoder to continue.

6. Press the METERS button to return to the Main screen.

Cards with a capacity of 32 GB or less will be formatted with the FAT32 file system. Cards with a capacity greater than 32 GB will be formatted with the exFAT file system.

ⓘ *The exFAT file system is not compatible with Windows XP or Mac OS X 10.6.4 or lower.*

Metadata and Take List

Metadata is used to convey the details or content of a recording. A take can consist of multiple metadata files.

The Take List allows the sound mixer to enter and edit the metadata of broadcast WAV files, such as Scene, Take, Notes, Track Names, and Circle Status.

Applications that can read Bext and iXML data will display the metadata of files generated by the 664. Metadata can also be used to generate a Sound Report in CSV file format directly from the 664.

ⓘ *Editing metadata may be done directly through the mixer's interface or via the Wingman app. For more information, see Wingman Integration: 6-Series.*

Topics in this section include:
▸ **Take List Overview**
  ▸ Accessing the Take List
▸ **Playing Takes**
▸ **Editing Metadata on the 664**
▸ **Using a Phrase List**
▸ **Clearing Scene List**
▸ **Metadata Overview**
▸ **Renaming or Deleting Previous Takes**
▸ **Editing Metadata in Other Programs**

Take List Overview

The Take List displays all tracks recorded across both media.

By default, when a recording is made, the name of the file is the take number, such as T01.wav. From the Take List, a user can enter a scene name for the next take so that when the recording occurs, the file name contains both scene and take.

In the Take List screen, takes are listed in the left column in the order they were recorded. The top item in orange text indicates the next take. The right column displays details about the highlighted take.

TAKE LIST

Highlighted take → A32T04

A32T01 [next]
A32T04
A32T03
A32T02
A32T01
T04
T05
T03

TC: 01:48:06:00 — Start timecode value of take
Card: CFwav,SDwav — What media the take is stored on
Folder: 12Y04M11 — The folder that the take is stored in
Scene: A32 — The scene name of the take
Take: 04 — The take number of the take
Date: 04/11/12 — The date the take was recorded
Notes: — The notes field

FILES   EDIT

In the example, the highlighted take is known as the current take. Edits made to the current take will be applied to the next take and subsequent recordings that follow. Previous takes are listed below the current take.

Accessing the Take List

There are two ways to access the Take List. One way is via the Main menu's FILE STORAGE sub-menu. The other is provided in the following procedure.

To access the Take List:

1. MENU + HP: Press and hold the MENU button and Headphone encoder.

    The Take List screen appears.

2. Turn the Headphone encoder to highlight takes and view details in the right column.

3. Press the METERS button to exit or close the Take List screen.

Playing Takes

Playback of a take may be initiated from the Take List.

To play a take from the Take List:

1. MENU + HP: Press in the MENU button and Headphone encoder together to view the Take List screen.

2. Turn the Headphone encoder to highlight a take to play.

3. Push down the Transport control to begin playback. The Main screen is displayed, and playback begins.

Editing Metadata on the 664

Notes, Scene, Take, Circle Status, Folder (tape), Project, and all track names may be edited directly from the Take List for next or previous takes.

ⓘ *The term "file" refers to a single file on one medium, but the term "take" refers to a recording which may consist of multiple files with identical content on different media. Editing a take in any way will affect all files associated with that take.*

To edit metadata from the Take List:

1. MENU + HP: Press and hold the MENU button + Headphone encoder together to view the Take List screen.

2. Turn and press the Headphone encoder to choose a take to edit. A list of metadata parameters appears.

ⓘ *Selecting the take at the top of the list (orange text and indicated by [NEXT]) will set metadata value for future takes. Selecting any other takes in the list will edit metadata for existing takes.*

3. Turn and press the Headphone encoder to choose what metadata to edit.

4. Some parameters are text-based, numeric-based, or a list of options. When editing, do one of the following:

   ▶ For text fields, use the on-screen keyboard (or an optional USB keyboard if attached) to enter text. When finished, slide the A B/C switch right to accept the value.

   ⓘ *The Scene field is a unique text field, allowing the user to <Add New Entry> or select from a list of previously created entries. There is also an option to clear the list. For more information, see Clearing Scene List.*

   ▶ For numeric fields, use the Headphone encoder to edit the value. When finished, select Done.

   ▶ For list fields, use the Headphone encoder to select a value.

   ⓘ *The Notes metadata field is a text field to provide extra information about a take that is not accounted for with other metadata fields. Notes may be created in manually for each take, using the on-screen keyboard; however, the field has the additional <Use Phrase> option, which may be selected for quick access to a user-definable list of common notational phrases.*

Using a Phrase List

Often, the same word or phrase is used in the Notes on many different takes. To save time on metadata entry, the 664 provides the ability to create a phrase list for rapid retrieval and usage.

To access the phrase list and add new entries:

1. HP + B/C: Push in and hold the Headphone encoder then slide the A B/C switch to the right. The Phrase List screen appears.

2. Slide the A B/C switch right again to add a new entry in the list.

3. Use the on-screen keyboard (or an optional USB keyboard if attached) to enter the new word or phrase. While entering data with the on-screen keyboard, any of the following steps may also apply:

   ▶ Use the MIC/TONE switch to toggle upper and lower case.

   ▶ If a mistake is made, slide the A B/C switch left to backspace; this erases text left of the current cursor position.

   ▶ Use the Select encoder to reposition cursor without removing any text already entered.

4. Slide the A B/C switch right to select OK and save the new entry.

To edit or delete a phrase list entry:

1. Access the Phrase List screen.

2. Turn the Headphone encoder to highlight an entry.

3. Do either of the following:
   ▶ Slide the MIC/TONE switch left to delete the chosen entry.
   ▶ Slide the MIC/TONE switch right to edit the chosen entry.

4. Select OK to approve changes or confirm deletion.

To use a phrase from the phrase list:

1. Access the Phrase List screen.

2. Turn the Headphone encoder to navigate the list.

3. Push in the Headphone encoder to apply the selected phrase.

During standby, the mixer applies the selected phrase to the last take recorded. While recording, however, a selected phrase is applied to the currently recording take.

ⓘ *The Phrase List screen is not available during playback.*

Clearing Scene List

When editing a take's scene, the metadata entry becomes part of a Scene list, making it easier to simply select from the list of commonly used scene names.

However, should it be necessary to clear the list, there is an option available that clears the entire list for the next take instead of having to delete each scene name from the list individually.

To clear the Scene list:

1. MENU + HP: Press MENU and Headphone encoder simultaneously. The Take List screen appears.

2. Select the next take.

3. Slide A/BC switch to edit the next take.

4. Turn and press the Headphone encoder to select Scene. The list will appear.

5. Select the <Clear List> option from the listed options.

6. When the Confirmation dialog appears, select OK to confirm.
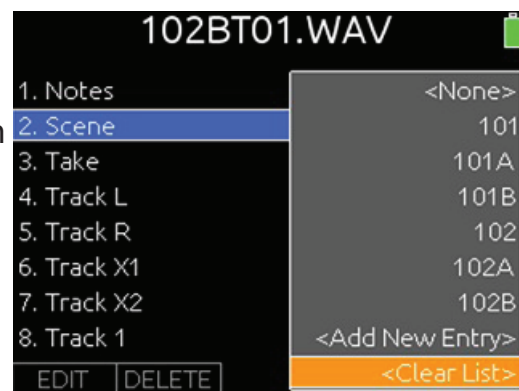
Metadata Overview

On the 664, broadcast WAV files include iXML data and bEXT chunk data. For applications that don't recognize bEXT or iXML, this information is ignored. The following chart details the supported metadata parameters.

METADATA PARAMETER	STORED IN	SET BY (U = USER, M = MACHINE)
Project	iXML	U; FILE STORAGE > Folder Options > Top-Level or Take List
Roll (Tape)	iXML, bEXT	M; uses creation date or is overridden by User U; FILE STORAGE > Folder Options > Mid-Level or Take List
Scene	iXML, bEXT	U; Take List
Take	iXML, bEXT	M or U; Take List
Notes	iXML, bEXT	U; Take List
Circle Take	iXML	U; Take List
File UID	iXML	M; Unique File Identifier
File Sample Rate	iXML, FMT	U; RECORDER > Sample Rate
Digitizer Sample Rate	iXML	U; Actual sample rate of AD converter
Bit Depth	iXML, FMT	U; RECORDER > Bit Depth menu
Channels	iXML, FMT	U; Number of channels (tracks) in the file
Frame Rate	iXML, bEXT	U; TIMECODE/SYNC > Frame Rate
TC Flag (ND or NDF)	iXML, bEXT	U; TIMECODE/SYNC > Frame Rate
Start Time Code	iXML, bEXT	M; Stored as a sample count since midnight
Duration		M
U-Bits	iXML, bEXT	U; TIMECODE/SYNC > Set Generator UBits
Time Code Sample Rate	iXML	M
Channel Index	iXML	M; Track Number
Interleave Index	iXML	M
Track Name	iXML, bEXT	U; Take List
Master Speed	iXML	M
Current Speed	iXML	M
Speed Note	iXML	M
Originator	bEXT	M
Creation Date	bEXT	M
Creation Time	bEXT	M
Originator Reference	bEXT	M
Software Version	bEXT	M
Family UID	iXML	M; shared by files belonging to the same take
Total Files	iXML	M; number of files representing a take
File Set Index	iXML	M
Original File Name	iXML	M

Metadata is included in MP3 files inside the ID3 tags. Metadata in MP3 files can not be edited with the 664. The following table shows the ID3 fields that metadata is stored in and the format in which it is stored.

ⓘ *Square brackets denote variables and are not included in actual metadata.*

ID3 FIELD	FORMAT
Artist Name	TC=[HH:MM:SS:FF]
Track Title	SC=[scene name] TK=[take number]
Album Title	FR=[frame rate] D=[duration]

Renaming or Deleting Previous Takes

Previous takes can be renamed or deleted from the Take List. When a take is renamed or deleted, the action applies to all files associated with that take on both media.

To rename a take:

1. MENU + HP: Press in the MENU button and Headphone encoder together to view the Take List screen.

2. Turn the Headphone encoder to choose a take from the list. This does not apply to Next takes.

3. Turn and press the Headphone encoder to select Rename. Enter a value using the on-screen keyboard or an optional USB keyboard, if attached.

4. When finished, slide the A B/C switch right or press Enter on the attached USB keyboard.

To delete a take:

1. MENU + HP: Press in the MENU button and Headphone encoder together to view the Take List screen.

2. Turn and press the Headphone encoder to choose a take to delete.

3. Turn and press the Headphone encoder to select Delete.

4. Press the Headphone encoder to confirm deletion (OK).

ⓘ *Turn and press the Headphone encoder to select Cancel should you want to exit without deleting the take.*

Editing Metadata in Other Programs

Since Sound Devices recorders write metadata to WAV files using the Broadcast Wave File standard, many professional applications can read and edit this metadata. Sometimes, it is useful to edit metadata in bulk after recording and before sending the files to post-production.

System

The 664 SYSTEM sub-menu allows for setup and control of various key system settings, such as tone or bell levels, date and time parameters, meter ballistics and more.

This sub-menu also provides access to viewing product version information and conducting firmware updates.

Some System settings, such as those related to headphones, Meter Views, or the LCD, are described in more detail in others sections of this guide where applicable. This section provides information for System settings not already covered elsewhere.

Topics in this section include:

▸ **Setting up Tones and Bells**
    ▸ Configuring Record/Stop and Warning Bells
▸ **Configuring the Meters**
    ▸ Setting Meter Ballistics and Peak Hold
    ▸ Setting Peak Hold
▸ **Setting up Date and Time Parameters**
▸ **Calibrating Faders & Pans**
▸ **Using a USB Keyboard**
▸ **Viewing Shortcut Information**
▸ **Viewing User Guide via Smart Phone**
▸ **Viewing Version Information**
▸ **Updating Firmware**

Setting up Tones and Bells

The 664's internal tone oscillator, used for sending tone to outputs and tracks, has several settings to accommodate different workflows.

Activating tone is explained in more detail in the *Sending Tone to Outputs* section of this guide.

To define tone settings:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM.

    There are four sub-menus related to setting tones.

3. Configure the tone oscillator by modifying the following parameters.

PARAMETER	DESCRIPTION	OPTIONS
Tone Level	Sets the level of the internal tone generator. By default, this level is set to 0 dBu.	• 0-20 dBu (1 dBu increment)
Tone Frequency	Sets the audio frequency of the internal tone generator. By default, this frequency is set to 1000 Hz.	• 100-10000 Hz (10 Hz increment)

PARAMETER	DESCRIPTION	OPTIONS
Tone Mode	The option chosen for this mode becomes the primary action of the MIC/TONE switch, with the other option not chosen becoming the secondary action. • The primary action defines what happens when the MIC/TONE switch is slid to the right. By default, this action is set to send a continuous tone. • The secondary action defines what happens when the SELECT encoder is pressed and held as the MIC/TONE switch is slid to the right. By default, this action is set to L Ident.	• Continuous • L Ident
Tone Routing	Sets the destination of the tone generator. The tone signal can be routed to any output or track. By default, LR+ Direct Outs are selected.	• LR+Direct Outs • LR+X1+Direct Outs • LR+X2+Direct Outs • LR+X1X2+Direct Out

Configuring Record/Stop and Warning Bells

The mixer provides audible alerts called the Record/Stop and Warning bells. The start of a recording is indicated audibly by a single 440 Hz tone sent to the sound mixer's headphones. When recording is stopped two 220 Hz tones are sent. Likewise, warning bells alert users with an audible tone when the mixer has encountered an error, such as low power.

The default decibel level for these bells is -30 dBFS, but that level may be changed in 1 dB increments from -60 to -12 dbFS, or turned off entirely.

To set the warning bell level:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Warning Bell Level.

3. Turn and press the Headphone encoder to set a new level. Options include: Off, -60 to -12 dbFS in 1 dB increments.

ⓘ *Setting the warning bell level also adjusts the level used for Record/Stop bells.*

By default, the Record/Stop bells are turned on, but they may be turned off.

To turn on or off the Record/Stop bells:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Record/Stop Bell.

3. Turn and press the Headphone encoder to enable or disable the bell. Options include: On or Off.

ⓘ *Disabling Record/Stop bells does not apply to Warning bells.*

Configuring the Meters
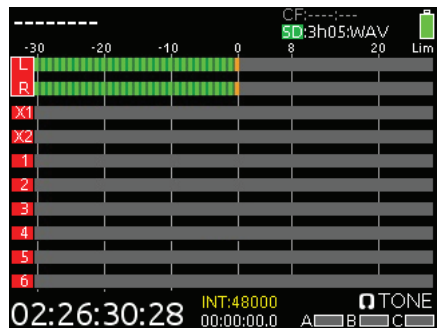
The meters displayed in Meter Views are configurable. For instance, the meters can be displayed as segmented or solid bars.
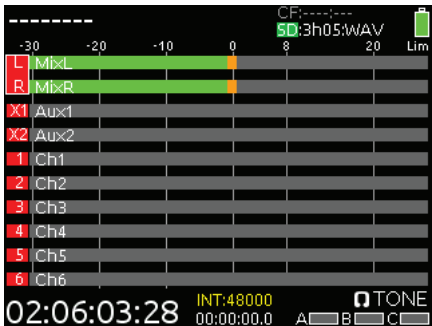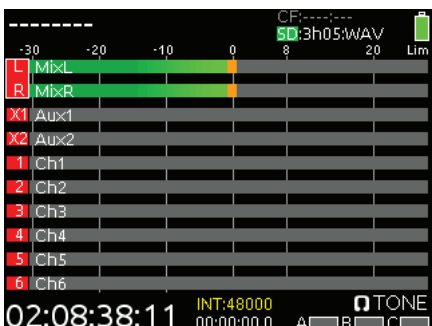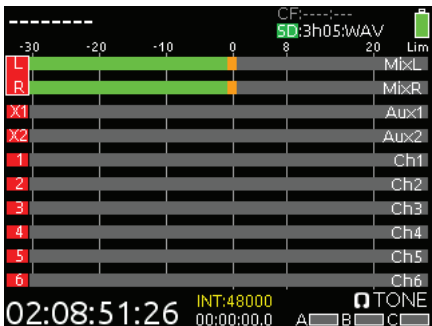
Additionally, the track names may be displayed to help identify the tracks in Meter Views.

To configure the meters:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Meter Display Style.

   ▶ To display segmented meters, set the style to Segmented.

   ▶ To display meters as solid bars, set the style to Solid.

3. Turn and press the Headphone encoder to select SYSTEM > Track Names in Meters.

   Options include:

OPTION	DESCRIPTION	EXAMPLE
Off	Turns off the display of track names in meters. ⓘ *The example shows segmented meters.*	

OPTION	DESCRIPTION	EXAMPLE
Left	Positions track names on the lower end of the meter scale. ⓘ *The example shows solid meters.*	
Left w/ramp	Applies a gradient to the background color, and positions track names on the lower end of the meter scale.	
Right	Positions track names on the higher end of the meter scale.	

Setting Meter Ballistics and Peak Hold

Audio meter ballistics is the manner in which a visual meter responds to audio signal levels. The ballistics for all meters is globally set for the mixer via System settings.

To configure meter ballistics:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select SYSTEM > Meter Ballistics.

   Options include:

OPTIONS	DESCRIPTION
VU Only	Volume Units (VU) meter ballistics correspond closely to how the human ear perceives loudness. This provides a good visual indication of how loud a signal will be. In VU mode, the attack and decay of the meter signal is 300 mS. VU meters provide good visual indication of how loud a signal will be, but provide poor information of actual signal peaks.

OPTIONS	DESCRIPTION
Peak + VU	In Peak + VU mode, the perceived loudness (or VU) is simultaneously displayed as a standard bar while the peak signal is displayed as a single, independent segment above the VU. By default, meter ballistics is set to Peak + VU.
Peak Only	Peak-reading ballistics (PPM) correspond to actual signal peaks, but do not necessarily correspond to perceived signal loudness. Peak meters have an instantaneous attack and a slow decay to allow visual monitoring of peak activity. Peak metering is useful in digital audio workflows. In the digital realm, signal overload can cause immediate distortion.

Setting Peak Hold

When meter ballistics is set to Peak + VU or Peak Only, peak hold displays the last highest peak value on the meter as a separate, individual meter segment. By default, this meter segment will remain visible for 1 second. This time frame is called the Peak Hold, and it may be adjusted or disabled altogether.

To modify the Peak Hold time for meters:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Meter Peak Hold Time.

   Options include:

OPTIONS	DESCRIPTION
1 - 5 sec	Sets the Peak Hold time to display the highest peak value for the selected time, from 1 to 5 seconds.
Infinity	Sets the Peak Hold time to display the last highest peak value indefinitely until a higher peak is reached.
Off	Does not hold peak values.

Setting up Date and Time Parameters

Properly setting the time and date is important for file metadata, file system functioning, and some timecode functions. Setting the correct GMT time zone and daylight savings values is also vital for correct data stamping on the exFAT file system.

The 664 has several System settings related to date and time parameters:

PARAMETER	DESCRIPTION	OPTIONS
Time Format	Sets the format used for times displayed by the mixer. By default the format is set to 12 hours.	• 12hr • 24hr
Date Format	Sets the format used to indicate the date, used in metadata. By default, the format is set to two-digit increments for month/day/year (mm/dd/yy).	• mm/dd/yy • dd/mm/yy • yy/mm/dd

Parameter	Description	Options
Set Time/Date	Displays the Set Time/Date screen used to set the time and date.	
Time Zone	Sets the time zone, based on Greenwich Mean Time (GMT).	• GMT-1:00 – -12.00 • GMT • GMT+1:00 – +13:00
Daylight Savings Time	Sets whether or not daylight savings is in effect. By default, daylight savings is off.	• On • Off

To set the formats for time and date:

1. Press the MENU button.

2. Do one of the following:
   ▶ Turn and press the Headphone encoder to select SYSTEM > Time Format.
   ▶ Turn and press the Headphone encoder to select SYSTEM > Date Format.

3. Turn and press the encoder to select a format option.
   ◦ Time Format options include: 12hr or 24hr.
   ◦ Date Format options include: mm/dd/yy, dd/mm/yy, or yy/mm/dd.

To set the time and date:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Set Time/Date.

3. Turn the encoder to move the highlight to each of the time and date fields.
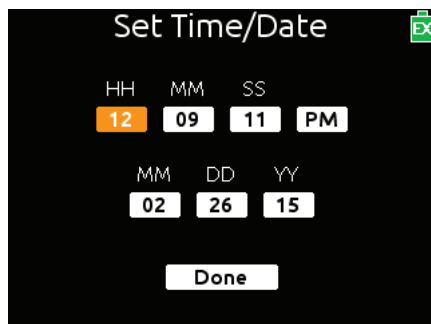
4. Press the encoder to select a field.

5. Turn the encoder to change the value of each selected field.

6. When finished modifying the time and date fields, turn and press the encoder to select Done.

To select the time zone:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Time Zone.

3. Turn and press the encoder to select the proper GMT time zone for your

location.
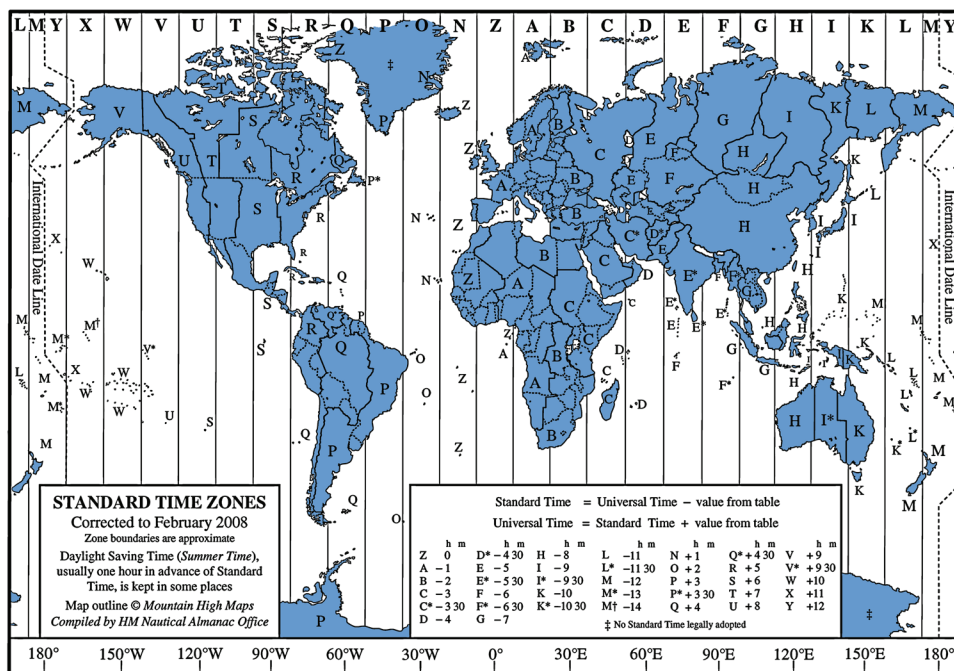
To enable or disable Daylight Saving Time:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Daylight Saving Time.

3. Do one of the following:
   ▶ To enable, turn and press the encoder to select On.
   ▶ To disable, turn and press the encoder to select Off.

Calibrating Faders & Pans

The 664 Faders and Pan pots come pre-calibrated to center. However, should they ever need to be recalibrated, that can be done via a System settings sub-menu option.

To calibrate faders and pans:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Fader/Pan Calibration.

3. Ensure all front panel controls are turned to the 12 o'clock position.

4. Press the Headphone encoder to select OK.

   A "Calibration Successful" message appears when calibration is complete.

ⓘ *To cancel without calibrating, press the MENU button or use the Headphone encoder to select Cancel.*

Using a USB Keyboard

Included with the 664 is a USB 2.0 A (Female to Female) connector and a USB A to B cable, which may be used to connect a standard USB keyboard to the 664 mixer.

To use a USB keyboard with the 664:

1. Ensure SYSTEM > USB Port sub-menu is set to Keyboard.

ⓘ *The USB Port is set to Keyboard by default; however, the alternative option is Factory Test, which is a setting reserved for the purposes of in-house quality assurance testing.*

2. Connect the keyboard's male USB A plug into the supplied USB A female adapter.
3. Connect the other end of the adapter to the USB A to B cable.
4. Plug the other end of the cable into the USB-B jack on the mixer's right side panel.

ⓘ *Keyboards with an embedded USB hub are not compatible. Apple brand keyboards are not compatible. Additionally, some keyboards must be connected only after the mixer is turned on.*

Keyboard shortcuts are provided in the *Shortcuts* section of this guide.

Viewing Shortcut Information

While this guide provides a section on the various shortcuts available with the 664, there is also an abbreviated list provided as a quick reference on the mixer itself.

To view shortcut information:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select SYSTEM > Shortcut Info.
3. Turn the encoder to scroll down the list.
4. Press the encoder to select OK and exit the list.

Viewing User Guide via Smart Phone

The 664 provides QR codes on screen for smart phone access to product-related documentation, including this user guide, available online.

ⓘ *Accessing documentation via a QR code requires the installation on your smart phone of a code reader application—many of which are available as free downloads from App stores.*

To access the 664 User Guide via QR code:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > User Guide link.

3. Using your phones code reader application, scan the QR code to view the guide (PDF format).

Viewing Version Information

Information regarding the product's serial number, software and timecode versions, plus build numbers is provided on the mixer via a System settings sub-menu option.

To view version information:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Version Info.

Updating Firmware

Periodically, Sound Devices releases firmware updates to improve system performance and expand the 664 feature set, which may be downloaded from the website and used to update the firmware on the mixer.

It is highly recommended that users update to the latest version of firmware available as soon as possible.

To update firmware:

1. Download the free firmware from the Sound Devices website to your computer.

2. Extract the ZIP file, which will contain a folder with a .prg file and related documentation.

3. Copy this .prg file to the root level of an approved SD or CF memory card. Do not place the file in any folder.

ⓘ *Be sure to use a memory card already formatted in the mixer.*

4. Insert the SD or CF card with the .prg file.

5. Power on the mixer if not already on.

⚠ ***Power the mixer from an external DC power source. Do not perform firmware updates with low batteries or unstable power sources.***

6. Press the MENU button.

7. Turn and press the Headphone encoder to select SYSTEM > Update Firmware.

8. Follow the on-screen instructions.

9. After the update is complete, the mixer power cycles.

   When it reboots, the updated version number will appear briefly on the splash screen, and the mixer displays a message confirming the firmware update.

Quick Setup

The 664 helps improve work-flow efficiency by providing users a way to save and load various custom configurations as Quick Setup XML files.

These Quick Setup files retain all settings made in the Main menu as well as adjustments made to all inputs (including routing) via the Input Settings screens.

Four configurations may be saved directly to the mixer; others may be saved to memory cards for use later.

Topics in this section include:
▶ **Saving Settings**
  ▶ Copying Quick Setup Files
  ▶ Deleting Quick Setup Files
▶ **Loading Previously Saved Settings**

Saving Settings

After you have configured the 664's settings via the Main menu and Input Settings screens, you can save the configuration as a Quick Setup file.

To save settings as a Quick Setup file:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select QUICK SETUP.

3. Select where you want to save your settings. Options include:

OPTION	DESCRIPTION
INT1 - INT4	Select one of the Save Settings to INT (1-4) options to store your configuration locally on the mixer. There are four internal (INT) locations. Each will hold one Quick Setup file. ⓘ *New settings stored to an INT location will overwrite any Quick Setup file previously stored there.*
CF	Select Save Settings to CF to store your configuration on any CompactFlash memory card inserted into the 664.
SD	Select Save Settings to SD to store your configuration on any Secure Digital memory card inserted into the 664. ⓘ *Saving to a CF or SD card will create a folder named SETTINGS, if it does not already exist.*

4. Name your Quick Setup file.

ⓘ *When saving to CF or SD cards, if a file with the entered name already exists, that previous file will be overwritten by the new file you save.*

5. Slide the A B/C switch to select OK and save your Quick Setup file.

    All Quick Setup files are saved as XML files.

Copying Quick Setup Files

Quick Setup files saved on one memory card may be copied to another memory card as an additional backup.

To copy files from one memory card to another:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select FILE STORAGE > File List.
3. Select the memory card with the file you want to copy.
4. Select the SETTINGS folder on that card.
5. Select the Quick Setup XML file you want to copy.
6. Slide the A B/C switch to access OPTION.
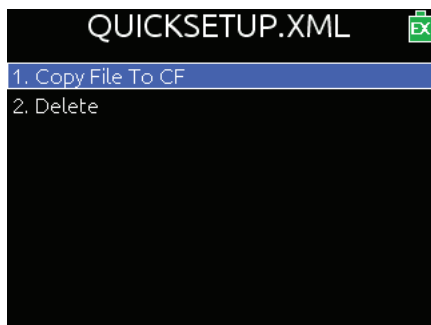
7. Select the Copy File ... option. The name of this option will vary depending on whether you are copying to a CF card or an SD card.

Deleting Quick Setup Files

Saving a new configuration to any of the internal (INT) locations will overwrite the previously saved file. The same applies to files saved to CF or SD cards so long as the file names match.

However, if you want to delete a file from a CF or SD card, you can do that without replacing it with a file of the same name.

To delete a file from a memory card:

1. Press the MENU button.
2. Turn and press the Headphone encoder to select FILE STORAGE > File List.

3. Select the memory card with the file you want to delete.

4. Select the SETTINGS folder on that card.

5. Select the Quick Setup XML file you want to delete.

6. Slide the A B/C switch to access OPTION.

7. Select Delete.

Loading Previously Saved Settings

For fast reconfiguring of the 664, previously stored Quick Setup files may be easily loaded from internal locations or memory cards inserted into the mixer.

To load a Quick Setup file:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select QUICK SETUP > Load Settings.

QUICK SETUP

1. Load Settings
2. Save Settings to INT1
3. Save Settings to INT2
4. Save Settings to INT3
5. Save Settings to INT4
6. Save Settings to CF
7. Save Settings to SD
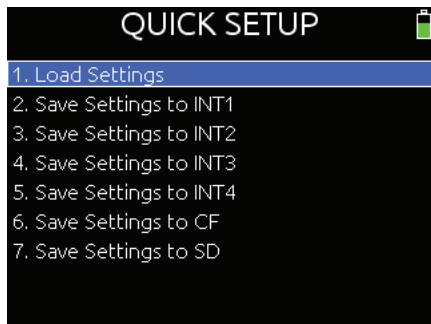
3. Select the file you want to load from the provided list.

ⓘ *The first option in the list reloads the Factory Default settings. Selecting this option restores all settings on the mixer to original factory defaults.*

Mixer Linking

The 664 features a Link I/O connection on its right side panel, which allows the 664 to be interconnected with another 664 or a 552 mixer for applications requiring more inputs.

The Link I/O connection may also be used to link a 664 to a 442, 302, or MixPre-D for applications requiring higher input channel counts.

The Link I/O connector is an unbalanced TA5M wired accordingly: pin 1=HP L, pin 2=HP R, pin 3=Mix R, pin 4=Mix L, and pin 5=link detection/ground.

Topics in this section include:
- ‣ **Linking to another 664 or 552**
- ‣ **Linking to a 442 or 302**
- ‣ **Linking to a MixPre-D**

Linking to another 664 or 552

When using the XL-TA55 cable to connect a 664 to another 664, it essentially connects the Mix and HP bus of each mixer directly together through analog switches. Each link becomes a "two-way street" so both mixer inputs appear on both mixers HP and Mix outputs.

Combining two circuits in this way changes their impedances and therefore gain/signal level. When the linked models are the same, the changes are identical. Because the circuit characteristics of the 664 are different than the 552, however, gain on the 552 must be adjusted to compensate.

When the 664 is linked with another 664 or a 552, all inputs appear at both mixer's outputs. The stereo mix from the other mixer is routed to the 664's stereo master bus and recorded on tracks L and R. Return audio and PFL occur on the headphone output of both mixers.

To link a 664 to another 664 or a 552 mixer:

1. Use the Sound Devices XL-TA55—a 12-inch, TA5F to TA5F accessory cable, as shown—to connect the Link I/O of the 664 to the Link I/O of the other mixer. This will sent the stereo mix of each mixer directly to the stereo output bus of both mixers.

2. Monitor the stereo sum of all input channels from either mixer headphone

     monitor.

3. Adjust the levels on each mixer accordingly.

Linking to a 442 or 302

Because the 442 and 302 do not have LINK I/O ports, their signals are taken from their Mix Out jacks, which are not compatible with LINK I/O, so their gains have to be adjusted to compensate. When linking from smaller mixers into the 664, using the XL-TA35 cable, their gains have to be increased by about 12 dB to match the other 664 inputs.

ⓘ *The XL-TA35 cable does not provide for linking the headphone buses.*

When the 664 is linked with a 442 or 302, all input channels will be present on the stereo master bus of the 664. Return audio and PFL only occur on the head-phone output of the mixer on which it is performed.

To link a 664 to a 442 or a 302:

1. Use the Sound Devices XL-TA35—a 12-inch, TA5F to TA3F accessory cable, as shown—to connect the Link I/O of the 664 to the Tape Out/Mix Out connector on the 442 or 302. This sends the stereo mix of both mixers directly to the stereo master bus of the 664.

ⓘ *The 442 has two Tape Out/Mix Out connectors, a 3.5 mm and a TA3. The connector on the 302 is an unbalanced stereo TA3F. For the most secure connection, use the TA3 Tape Out/Mix Out connector. The TA3 connectors on a 442 and 302 are wired accordingly: pin 1=ground, pin 2=left, pin 3=right.*

2. Monitor and record the stereo sum of all input channels on the master bus of the 664.

3. Adjust the levels on each mixer accordingly.

Linking to a MixPre-D

Because the MixPre-D does not have a LINK I/O port, its signals are taken from the Tape Out jack, which means gain must be adjusted to compensate. When linking a MixPre-D to the 664, using the XL-TA25 cable, the gain has to be adjusted just short of clipping to match the other 664 inputs.

ⓘ *The XL-TA25 cable does not provide for linking the headphone buses.*

When the 664 is linked with a MixPre-D, all input channels will be present on the stereo master bus of the 664. Return audio and PFL only occur on the head-phone output of the mixer on which it is performed.

To link a 664 to a MixPre-D:

1. Use the Sound Devices XL-TA25—a 20-inch, TA5F to 3.5 mm TRS accessory cable, as shown—to connect the Link I/O of the 664 to the Tape Out connector on the MixPre-D. This sends the stereo mix of both mixers directly to the stereo master bus of the 664.

2. Monitor and record the stereo sum of all input channels on the master bus of the 664.

3. Adjust the levels on each mixer accordingly.

ⓘ *The MixPre-D's Tape Out 3.5 mm TRS is wired accordingly: tip=left, ring=right, sleeve=ground.*

Shortcuts
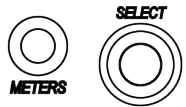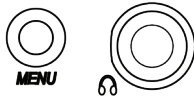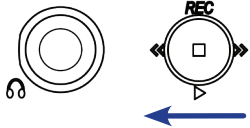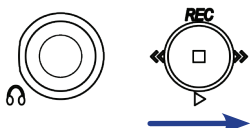
The 664 features numerous shortcuts to help speed navigation.
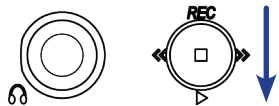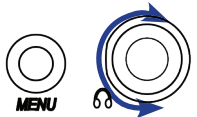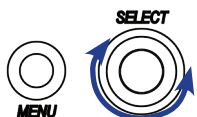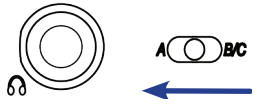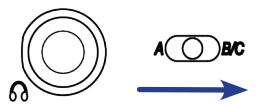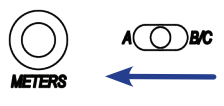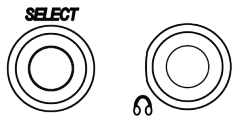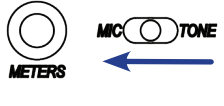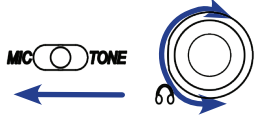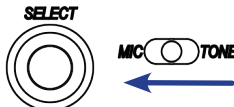
The shortcuts require either simultaneously pressing combinations of front panel controls or using keystroke combinations when a USB keyboard is attached to the mixer.
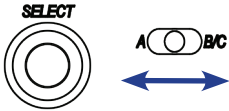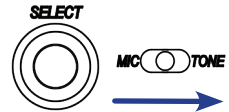
Topics in this section include:
▸ Front Panel Shortcuts
▸ USB Keyboard Shortcuts

Front Panel Shortcuts

FUNCTION	SEQUENCE	ACTION
Arm/Disarm Track	*SELECT / METERS*	METERS + SELECT: Press and hold METERS then press the Select encoder. This toggles the armed status of the highlighted track on the Main screen.
File/Take List	*MENU / HP*	MENU + HP: Press and hold MENU then press the Headphone encoder. This displays the Take List screen. Sliding the MIC/TONE switch left then toggles between the Files and Takes.
False Take	*HP / REC*	HP + << (Rewind): Press and hold the Headphone encoder then push the Transport control to the left. This moves the previous recorded file(s) to the False Takes folder and decrements the Take number.
Scene Increment	*HP / REC*	HP + >> (Fast Forward): Press and hold the Headphone encoder then push the Transport control to the right. This increments the scene name according to the Scene Increment Mode setting.

FUNCTION	SEQUENCE	ACTION
Toggle Playback Card		HP + Play: Press and hold the Headphone encoder then push the Transport control downward (Play). This toggles the playback media card between SD or CF. Target media is indicated by a green background on the Main screen.
LED Brightness		MENU + HP turn: Press and hold MENU then turn the Headphone encoder. This adjusts the brightness of all LEDs.
LCD Brightness		MENU + SELECT turn: Press and hold MENU then turn the Select encoder. This adjusts the back-light level of the LCD.
Scene Name		HP + A: Press and hold the Headphone encoder then slide the A B/C switch to the left. This enables editing of the scene name. When used during recording, the current scene name is edited. During standby, when not recording, the next scene name is edited.
Current Take Phrase		HP + B/C: Press and hold the Headphone encoder then slide the A B/C switch to the right. This accesses the Phrase List screen and applies the selected phrase to the last take recorded (during standby) or to the currently recording take (during recording).
Toggle Sample/Frame Rate Display		METERS + A: Press and hold METERS then slide the A B/C switch to the left. This toggles the display of timecode frame rate information and audio sample rate information.
Toggle Daylight Mode		SELECT + HP: Press and hold Select encoder then push in Headphone encoder. This toggles the LCD display between Standard and Daylight modes.
Jam Menu		METERS + MIC: Press and hold METERS then slide the MIC/TONE switch to the left. This accesses the TC Jam menu.
Slate Mic Gain		MIC + HP turn: Slide and hold the MIC/TONE switch to the left then turn the Headphone encoder. This adjusts the slate mic's gain.
Alternate MIC Functionality		SELECT + MIC: Press and hold the Select encoder then slide the MIC/TONE switch to the left. This engages either slate or com, whichever one is set as the alternate setting configured via COMMS/RETURNS > Mic Toggle Switch.

FUNCTION	SEQUENCE	ACTION
Alternate Return Functionality	*SELECT* A◯B/C ⟷	SELECT + MIC: Press and hold the Select encoder then slide the A B/C switch to the left or right.
		If left, this engages either RTN A or COM RTN, whichever is the alternative setting configured via COMMS/RETURNS > RTN Toggle Left.
		If right, this engages either RTN B or RTN C, whichever is the alternative setting configured via COMMS/RETURNS > RTN Toggle Right.
Alternate Tone Mode	*SELECT* MIC◯TONE →	SELECT + TONE: Press and hold the Select encoder then slide and briefly hold the MIC/TONE switch to the right.
		This engages tone using the alternative setting not presently configured as SYSTEM > Tone Mode.

USB Keyboard Shortcuts

A standard USB keyboard connects to the 664 to ease navigation and data entry. Attach the keyboard to the 664 USB port using a USB A to USB A adapter (included). Anytime the QWERTY pop up keyboard is displayed, the USB keyboard can be used to enter data.

Additionally, the following shortcuts are available.

ⓘ *Keyboards with an embedded USB hub are not compatible. Apple brand keyboards are not compatible. Some keyboards must be connected only after the mixer is turned on.*

KEYSTROKES	ACTION
F1 or Menu key	Accesses the Main menu.
F2	Accesses the Take List.
F3	Cycles between available Meters views and the Main screen.
Ctrl + R	Record.
Ctrl + S	Stop.
Spacebar	Play.
Left Arrow	Main screen: Rewind.
	Input Settings screen (2, 4, & 6): Toggle phase inversion.
	Input Settings screen (7-12): Toggle L Mix assignment.
Right Arrow	Main screen: Fast forward.
	Input Settings screen (1-6): Toggle LR Mix assignment.
	Input Settings screen (7-12): Toggle R Mix assignment.
Up / Down Arrows	Main screen: Adjusts headphone volume.
	In menus: Moves highlight.
	While editing parameters: Changes the value.
Enter	Main screen: Accesses the HP Monitor Source list.
	In menus: Activates current selection. (Same as encoder press.)

Keystrokes	Action
Alt + Enter	Main screen: Toggles arming of selected track.
Ctrl + Enter	Access gain adjustment for highlighted L, R, X1, X2, or RTN track.
Ctrl + Up/Down Arrows	Main screen: Select tracks. Input Settings screen: Adjusts trim gain for inputs 7-12.
Ctrl + Left Arrow	Input Settings screen: Change X1 assignment.
Ctrl + Right Arrow	Input Settings screen: Change X2 assignment.
Ctrl + Alt + P	Capture the current LCD screen as a bitmap image and save the BMP file to the SD card.

Wingman Integration: 6-Series

Wingman is an iOS-based application that provides wireless remote control and monitoring of any 6-Series field production mixer/recorder—the 688, 664, or 633.

It may be downloaded from Apple's App Store and installed on any iPad, iPhone, or iPod Touch mobile device, running iOS 8.0 or later.

The WM-Connect hardware accessory, a Bluetooth® Smart USB dongle for the 6-Series, is required for this integration.

ⓘ *Instructions for installing WM-Connect and downloading the Wingman app are provided in the* WM-Connect Quick Start Guide, *shipped with the hardware and offered as a free PDF download from the Sound Devices website.*

Topics in this section include:
‣ **Starting Wingman**
‣ **User Interface**
‣ **Transport View**
  ‣ Connecting to a 6-Series Mixer
  ‣ Using Transport Controls
  ‣ Designating Circle and False Takes
  ‣ Using Meter Views
  ‣ Editing Track Names
  ‣ Arming/Disarming Tracks
‣ **Take List View**
  ‣ Editing a Take's Metadata
‣ **Reports View**
  ‣ Creating Sound Reports
‣ **About View**
‣ **Track View on iPhone or iPod Touch**

Starting Wingman

Before starting the application, ensure the WM-Connect hardware accessory (shown at right) is attached to your 6-Series mixer, that Bluetooth is turned on (on your mobile device), and the mixer is both powered on and running the latest firmware.

To start the Wingman App:

▶ Tap the Wingman icon.

Setting up Wingman Password

For added security, when using the Wingman App to monitor and control the recorder from a mobile device, set up the 6-Series mixer to require a password for remote access. The password may be up to 18 alpha-numeric characters. Punctuation other than a hyphen or an underscore is not permitted.

To set a remote password:

1. Press the MENU button.

2. Turn and press the Headphone encoder to select SYSTEM > Wingman Password > Enter Password.

3. When the virtual keyboard appears, enter a password.

4. When finished, slide the RTN/FAV switch right (or Enter on attached USB-keyboard) to select OK.

5. When prompted to confirm, press the Headphone encoder to select OK again.
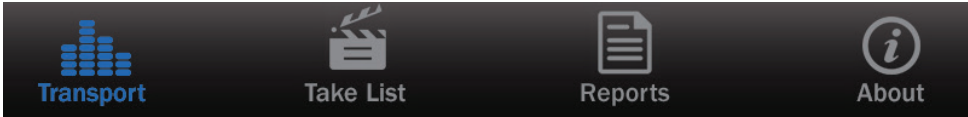
User Interface

The Wingman software application provides an easy-to-navigate, touch-screen user interface. However, because of variable screen sizes, views and some procedures differ depending on which mobile device is in use.

While both landscape and portrait orientation is supported on an iPad, this section describes the application's user interface and depicts images of the application as it appears (in portrait orientation) on an iPad.

ⓘ *For information pertaining to how the views and workflow differ on the smaller screens of an iPhone or iPod Touch, see Track View on iPhone or iPod Touch.*

The main screen is divided into three parts: the status bar, the viewing area, and the tab bar.

PART	DESCRIPTION
Status Bar	The status bar is device specific; therefore, it will vary in appearance based on the type of iOS mobile device being used. It often displays small, informative icons such as Bluetooth, WiFi, and battery power indicators.
Viewing Area	This area, located between the status and tab bars, displays the different screen views of the Wingman application. The main screen is the Transport view, but others are available. The four views include: • Transport - See *Transport View* for more information. • Take List - See *Take List View* for more information. • Reports - See *Reports View* for more information. • About - See *About View* for more information. **To select a view:** ▶ Tap the icon (on the tab bar) that corresponds to the required view. On the main screen, there are multiple meter views available with the vertical swipe of a finger. See *Using Meter Views* for more information.
Tab Bar	This bar remains on-screen at all times and displays four icons, enabling access to the different screen views of the user interface. Each icon appears blue when that icon's corresponding view is displayed.

iPad 2:42 PM 96%

Status Bar

400BT04.WAV

00:00:00:0 00:28:03:15 29.97 ND

CURRENT NEXT

SCENE 400B 400C SCENE

TAKE 04 01 TAKE

NOTES sirens. NOTES

WINGMAN™
BY SOUND DEVICES

Viewing Area

-30 -20 -10 0 8 20 Lim

L Left Mix

R Right Mix

Lim Lim
20 20

8 8

0 0

-10 -10

-20 -20

Boom Alan Carla Denise Unused Unused Beth Henry Marla Steve Plant L Plant R

-30 -30

1 2 3 4 5 6 7 8 9 10 11 12

Tab Bar

Transport Take List Reports About

Transport View

The Transport view is subdivided into four sections, displaying the following:

| SECTION	DESCRIPTION
Timecode	This section (shown below) provides the current file name, as well as a bar with the following information: • a large Timecode display • a Connection icon bearing the Sound Devices logo • a smaller ABS time display • the timecode frame rate **400BT04.WAV** **00:28:03:15** 00:00:00:0 29.97 ND When recording, the background color of the bar turns red. The color of the Connection icon changes depending on the status of the connection to the WM-Connect, and in turn the 6-Series mixer. See *Connecting to a 6-Series Mixer* for more information.
Toolbar	The toolbar (shown below) has four round buttons for—from left to right—Record, Stop, Circle Take, and False Take. See *Using Transport Controls* and *Designating Circle and False Takes* for more information.
Metadata	This section bears the Wingman logo and provides text fields used to enter or edit metadata—such as scene name, take number, and notes—for both current and next takes. See *Editing a Take's Metadata* for more information. ⓘ *Due to smaller screen limitations, this section is not available in the application when used on the iPhone or iPod Touch. See Take List View for more information.*
Meters view	Use this area to arm/disarm tracks, edit track names, and view meters. Because the Wingman app offers three pre-configured meter views, the meters shown will vary depending on the meter view and to which type of 6-Series mixer Wingman is connected. See *Using Meter Views* for more information.

Connecting to a 6-Series Mixer

When running Wingman on an iPad, iPhone or iPod Touch, the Connection icon is located left of the Timecode display and bears the Sound Devices logo.

The color of the icon is significant, because it changes based on the connection status between the Wingman application on the mobile device and the WM-Connect Bluetooth® Smart USB accessory attached to a 6-Series mixer.

The color indicators are as follows:

COLOR	ICON	STATUS
Gray		Disconnected - either no activity or scanning for devices
Orange		Bluetooth connection in progress
Yellow		Connected - authentication underway
Green		Connected and authenticated

Connection to a 6-Series mixer with attached WM-Connect happens automatically when the Wingman application starts on a Bluetooth Smart-enabled iOS device. However, if more than one WM-Connect is within range, a Devices Found screen will appear, allowing you to select a mixer from the list.
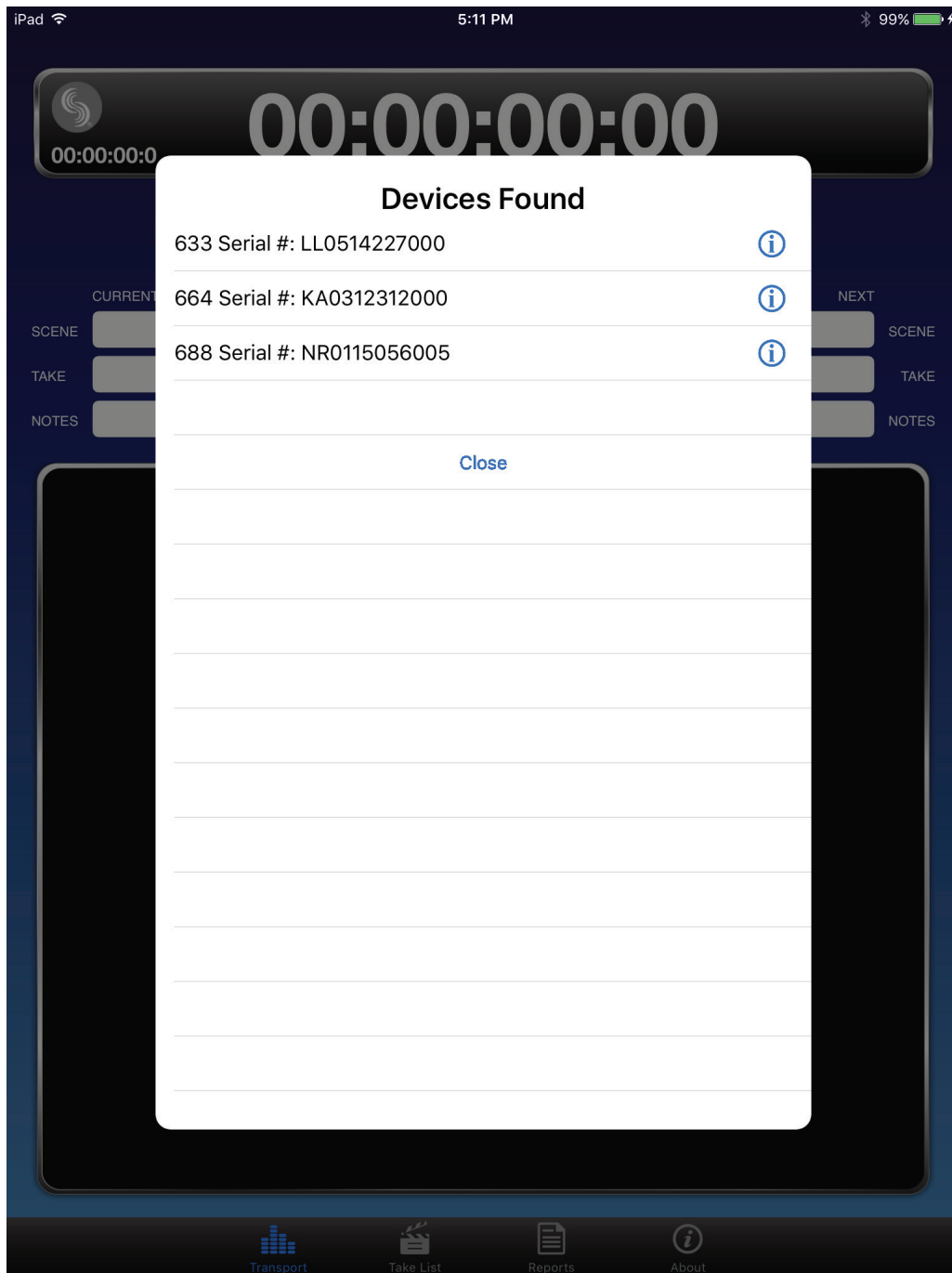
Use the Devices Found list to select a 6-Series mixer with a WM-Connect attached within range. Mixers that are within range but already connected to other Wingman applications are not visible in the Devices Found list.

To switch connection to a different 6-Series mixer:

1. Tap the Connection icon.

2. Select another mixer from the list of available devices.

ⓘ *For productions with multiple mixers of the same model, tapping the Circled-I icon helps identify the correct device, by displaying an "Identifying from Wingman" message on the chosen mixer's LCD.*

Using Transport Controls

When recording is in progress, the Transport view changes slightly. For instance, the background of the Timecode display appears red as does the center dot on the Record button.

To begin recording:

▶ Tap the Record button.

To stop recording:

▶ Tap the Stop button.

When stopped, the center dot on the Record button is white and the center square on the Stop button is yellow.
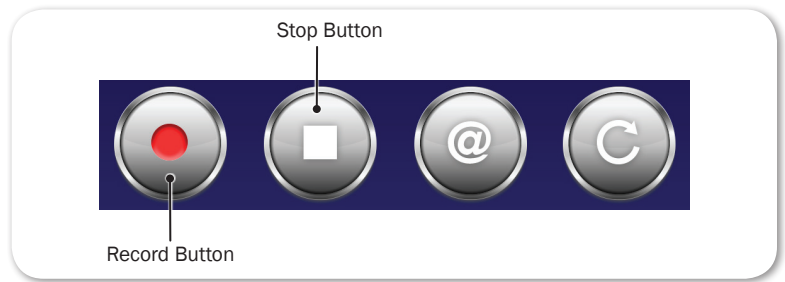
Designating Circle and False Takes

In the Transport view on the toolbar, there are buttons for circle and false takes.

Circling a take prepends the "at" symbol (@) to the take's filename and updates the file's metadata to "circled". Only the current recorded take may be circled using the Circle button; Previous takes can be circled in the Take list.

ⓘ *The current take cannot be circled while recording is in progress.*

To circle the current take:

▶ Tap the Circle button.

To circle a previous take:

▶ Tap Take List icon, select a previous take, and edit the Circled status from the take's Info screen.
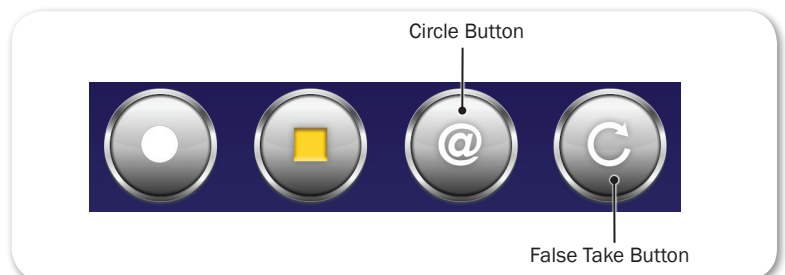
Designating a take as a false take moves the take to the mixer's False Takes folder and decrements the take number by 1. Only the current recorded take may be designated as a false take from the Transport view.

**To designate the current take as a false take:**

1. With recording stopped, tap the False Take button.

2. When prompted for confirmation to delete last take, select Delete.

    This moves the current take into the mixer's False Take folder.

Using Meter Views

As part of the main screen, metering is displayed with track names superimposed over the meters. In Wingman, there are three pre-configured meter views available within the Transport view.

In most cases, meters appear vertically in the Transport view; however, on the 688 or 664 as shown below, when the left and right bus tracks are displayed with ISOs, only the ISOs (1-12) are vertical, while the left and right bus tracks (LR) are positioned horizontally.
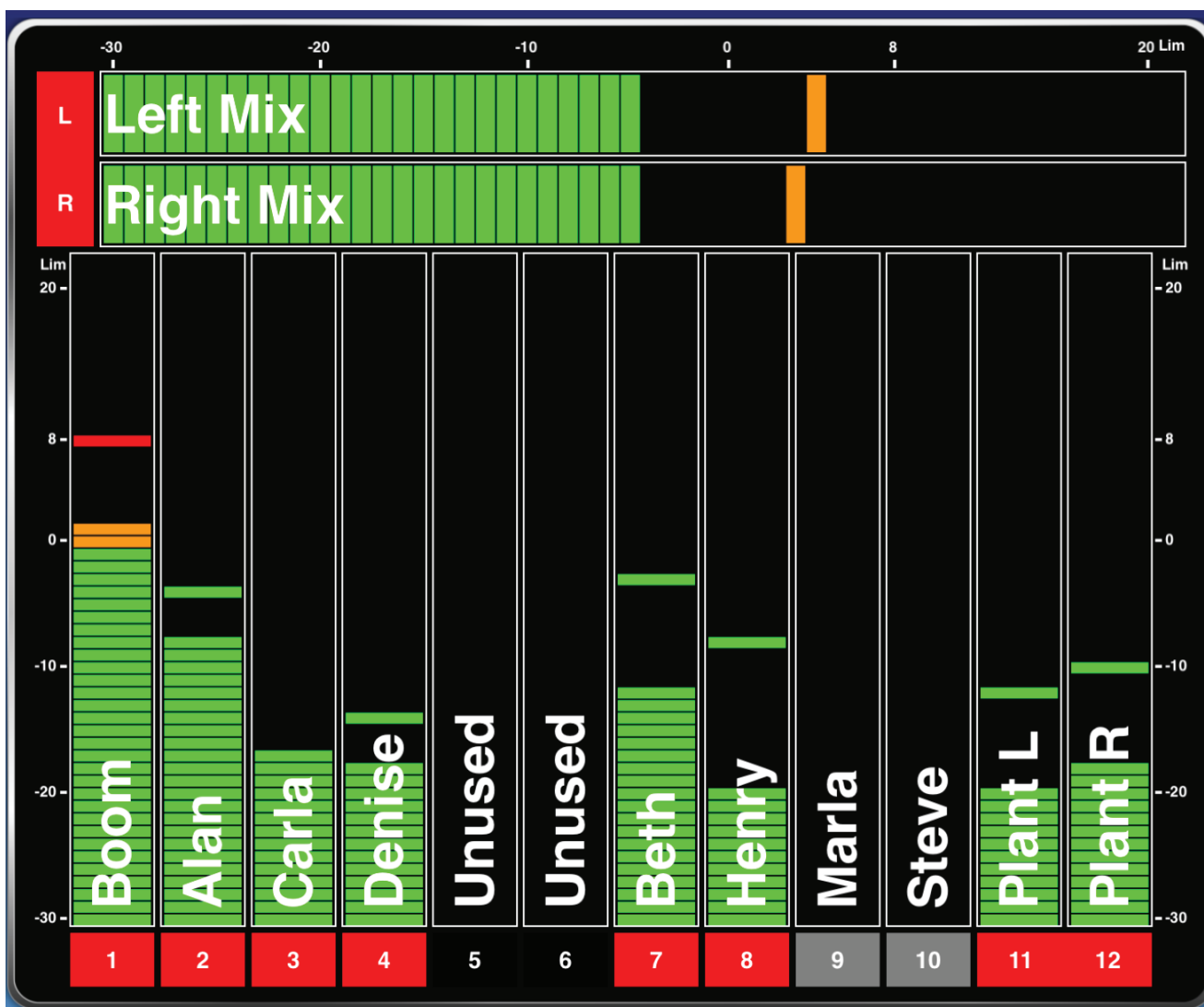
At the bottom of each vertical meter—or far left for horizontal meters—a rectangular label appears with a track identifier, such as L for left bus, 1 for Input 1, and so forth. The label's background color changes based on whether a track is on, off, armed or disarmed. For more information, see *Arming/ Disarming Tracks*.

Limiter indicators also appear on each meter when activated.

ⓘ   *For the 688 only—circle icons also appear as activity indicators when either auto mixer, MixAssist™ or Dugan, is turned on.*

The three available meter views vary depending on the model of mixer to which Wingman is connected; however, the procedure for toggling through the available meter views is the same.

To change the meter view:

▶   Slide a fingertip vertically up or down over the meters.
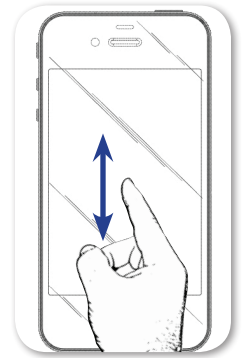
The following table explains which pre-configured meter views are available for each model in the 6-Series mixer/recorder line.

MIXER	METER VIEW	DESCRIPTION
688	LR, 1-12	This meter view shows left and right bus tracks as well as all 12 ISO tracks.
	LR, X1-X6	This meter view shows output signals of left, right, and X1 - X6.
	LR, X1, X2, RTNs	This meter view shows left, right, X1, and X2 bus tracks, plus returns A, B and C.
664	LR, 1-12	This meter view shows left and right bus tracks as well as all 12 ISO tracks.
	LR, X1, X2, RTNs	This meter view shows left, right, X1, and X2 bus tracks, plus returns A, B and C.
	LR, 1-6	This meter view shows left and right bus tracks as well as ISO tracks 1-6.
633	LR, X1, X2, 1-6	This meter view shows left, right, X1, and X2 bus tracks as well as all 6 ISO tracks.
	LR, 1-6	This meter view shows left and right bus tracks as well as all 6 ISO tracks.
	LR, X1-X4, RTN	This meter view shows left, right, X1, and X2 bus tracks, plus X3 - X4 output signals, and return.

Editing Track Names

On the iPad, in the Transport view, track names appear superimposed over the meters near the meter labels, and these names may be edited directly from this view.

ⓘ   *Due to smaller screen limitations, iPhones and iPod Touch devices do not show track names in the Transport view. Editing of track names is achieved from the Track view on the iPhone or iPod Touch. See Track View on iPhone or iPod Touch for more information.*

To edit track names:

1. Tap anywhere on the meter for the track you want to edit.

2. Use the virtual on-screen keyboard to modify the track name.

3. Tap Done when finished to save the changes.

ⓘ   *Tap anywhere on screen other than the keyboard to exit without saving changes.*

Arming/Disarming Tracks

The color of the meter label changes based on whether a track is armed (red) or disarmed (gray), which may be done via Wingman. If the input is turned off, however, the background color of the label is black.

ⓘ *Turning an input on or off cannot be done via Wingman; it must be done on the mixer itself.*

To arm/disarm a track:

▶ Tap the meter label. When armed the label turns red. When on but disarmed, the label is gray, as shown for inputs 9 and 10 in the example shown below.
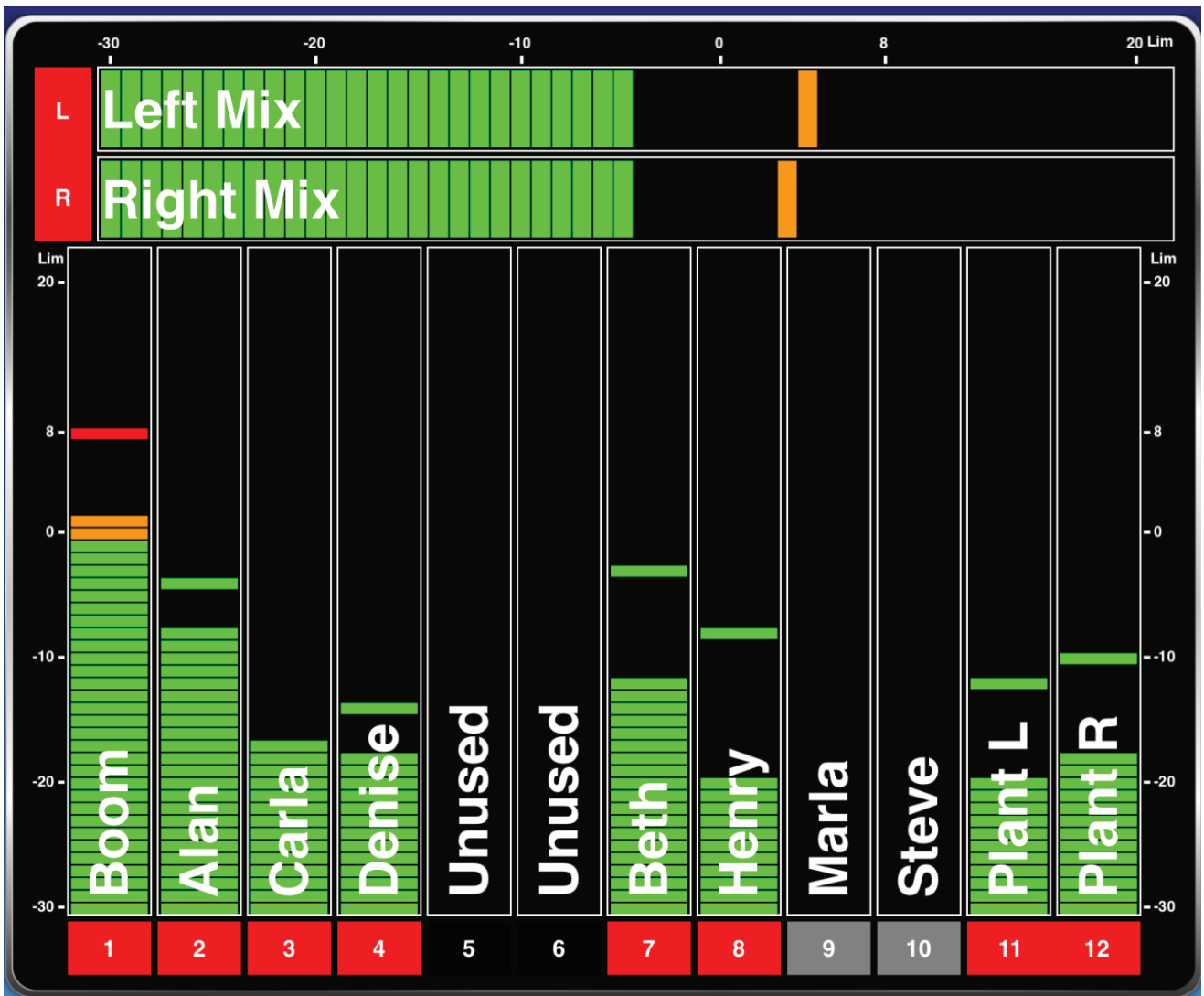
ⓘ *Meter labels are joined (displayed as a single label) to indicate when inputs or tracks are linked. This is shown in the example; see the meter labels for the left and right buses as well as inputs 11 and 12.*

Take List View

The Take List displays the next take, the current take, and up to 50 previous takes as a list of filenames and start timecode values. If applicable, notes and circled status are also displayed.

iPad 📶	2:46 PM	🔷 95% 🔋

400CT01.WAV
n

400BT04.WAV
00:25:56:00
sirens.
✳

400BT03.WAV
00:10:54:00
dog barking.

400BT02.WAV
01:36:33:00

400BT01.WAV
01:31:04:00
sirens.

@400AT04.WAV
01:20:05:00
airplane.
@

400AT03.WAV
01:19:58:00

400AT02.WAV
01:18:33:00
sirens.

400AT01.WAV
01:13:49:00
dog barking.

@401DT01.WAV

Filename:	400BT04.WAV
Scene:	400B
Take:	04
Notes:	sirens.
Circled:	⚪

TRACKS

Track L:	Left Mix
Track R:	Right Mix
Track 1:	Boom
Track 2:	Alan
Track 3:	Carla
Track 4:	Denise
Track 7:	Beth
Track 8:	Henry
Track 11:	Plant L
Track 12:	Plant R

Transport   Take List   Reports   About

Whether a take is circled will be indicated in the list with a large @ symbol, while the next and current takes are always at the top of the list and identified by unique icons.

Type	Icon	Description
Next		Designates the next take, which is always located at the top of the Take List.
Current		Designates the current take. The current take is the take in the process of being recorded or, if recording has stopped, it is the last recorded take.

To view a take's file information:

1. Tap the Take List icon.

2. Tap a take in the Take List. The Info screen for the chosen take appears on the right side for iPad, or full-screen on smaller iOS mobile devices.

Editing a Take's Metadata

Editing the filename, scene name, or take number of the current or next takes will affect all subsequent takes. Editing these fields on any previously recorded take affects that file only.

ⓘ *Take filenames are generated dynamically from the scene name and take number; therefore, they cannot be modified directly. Editing the scene name and/or take number will automatically change a take's filename.*

Editing metadata for any take may be accomplished from the Take List view.

Circling takes, designating false takes, and editing scene, take number or notes for current and next takes may be done from the Transport view's Metadata section (shown below - on iPad only). Fields are grayed out when disabled for editing, such as the Scene and Take fields while recording is in progress.

To edit current or next take metadata:

1. Do either of the following:
   ▶ From the Transport view, tap a field in the Take section and use the virtual keyboard to edit the data.
   ▶ From the Take List view, tap the next or current take to open the take's Info screen, and then tap a field to use the virtual keyboard and edit the data.

Reports View

All 6-Series mixers generate sound reports as comma separated values (CSV) files. These files, stored on CompactFlash or SD cards inserted into the mixer, may be opened and edited by many common spreadsheet applications.

From the Reports view in Wingman, you can modify sound report options, define the headers used in sound reports, and create sound reports.

ⓘ *Settings in the mixer's File Storage > Folder Options determine which files are used to generate the report and the current record directory in which the generated report is saved.*

To modify sound report options:

1. Tap the Reports icon.

2. In the Sound Report Options section, set Target Media. Options include: CF or SD. This option determines the media in the mixer on which a sound report is stored. The default is CF.

3. Set both email preferences accordingly.

OPTION	DESCRIPTION
Email:	Turns email on or off. If turned on, then after a sound report is created, the mobile device's email application opens with the CSV file automatically attached to a new email. When turned off, any sound report created is stored on the mixer, but not sent as an email attachment on the mobile device.
Email To:	The address entered here is automatically applied to the To field in the mobile device's email application when it is opened after creating a sound report.

To define headers for sound reports:

1. Tap the Reports icon.

2. In the Sound Report Info section, select a header to edit from the list. Headers include such options as: Project, Producer, Director, Location, Client, etc.

ⓘ *Some headers provide pre-configured options. For instance, Roll may be set to None or Mid-Level Folder. Likewise, Date provides three options: None, System, or User. When set to System, the mixer's system date is used in the sound report. When set to User, the sound report will use the date set by the user in the app.*

3. When necessary, use the virtual keyboard that appears to enter data.

4. Tap Done.

5. Repeat steps 2-4 as needed.

When editing a sound report header on the mixer directly, new entries may be added so that a list of options for a header is created. This is not the case when editing headers from Wingman. New entries are not created; rather the current selection for the chosen header on the mixer is modified. If a field is saved with no entry, the <None> option is used.

Creating Sound Reports

Sound reports created from Wingman are stored on the mixer and may be emailed from your iOS device.

To create a sound report:

1. Tap the Reports icon.
2. Tap the Create Report button at the top of the screen.
   - If the Email option is turned on, the sound report (csv) file will appear as an attachment to an email that opens on screen.
   - If the Email option is turned off, a message appears indicating the successful creation of the sound report, which is stored in the current directory on the target media (CF or SD) inserted into the mixer.

ⓘ *Report creation is not allowed during recording.*

About View

The About view displays important information and links related to the Wingman application and the 6-Series mixer to which it is connected.

Information available in the About view includes:
- Wingman application version number
- Build number
- WM-Connect version number
- 6-Series model number
- 6-Series firmware version number

Also included are interactive links to the following online resources:
- The WM-Connect Quick Start Guide
- The Wingman User Guide
- The connected 6-Series mixer's User Guide
- Link to file a Support Query with Sound Devices Technical Support

Track View on iPhone or iPod Touch

Because iPhone and iPod Touch mobile devices have smaller screens, the Wingman's user interface appears slightly different from the application when run on an iPad. The main differences lie with the Transport view, which on smaller screens does not display track names or the Metadata section.

For this reason, editing metadata for current and next takes must be done from the Take List view. Also, because the size of the meters are reduced in the Transport view on smaller iOS devices, editing and arming of tracks is accomplished via a separate Track view instead of from the Transport view.

To toggle between Transport and Track views:

▶   Swipe a fingertip horizontally across the screen.

Transport View
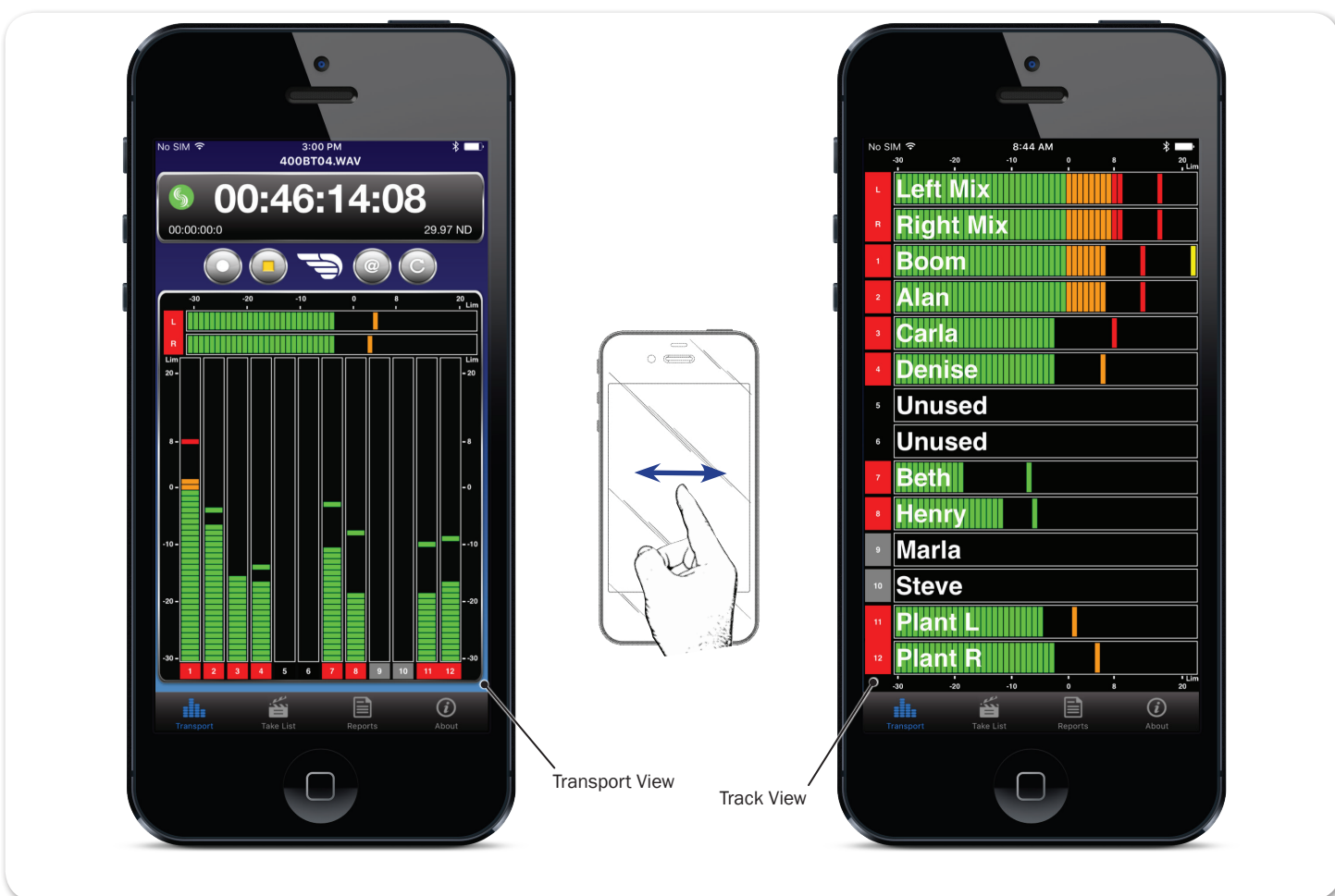
Track View

In the Track view, the Timecode display and toolbar with transport buttons disappear, and the meters are displayed horizontally full-screen, with track names superimposed over the meters.

To edit track names:

1.   While viewing Transport, swipe right or left to display the Track view.

2.   Tap anywhere on the horizontal meter for the track you want to edit.

3. Use the virtual on-screen keyboard to modify the track name.

4. Tap Done when finished to save the changes.

ⓘ *Tap anywhere on screen other than the keyboard to exit without saving changes.*

To arm/disarm a track:

1. While viewing Transport, swipe left or right to display the Track view.

2. Tap the meter label, located left of the meter for the track you want to arm or disarm. The background color will change accordingly. When armed the label turns red. When on but disarmed, the label is gray.

ⓘ *When input is off, the label appears black, and the input cannot be armed.*

Third-Party Remote Control

Through collaboration with third-party companies— Ambient Recording, Lockit Network GmbH, PureBlend Software and Timecode Systems—Sound Devices offers wireless remote control of any 6-Series mixer (688, 664, and 633) via iOS and web-based mobile devices.

This section outlines the benefits and what is required for iOS and web-based wireless remote control integration. Please refer to your third-party manufacturer's documentation for more details on setup and basic user information.

Topics in this section include:
‣ **Control in the Palm of Your Hand**
‣ **iOS Wireless Remote Control**
‣ **Web-based Wireless Remote Control**

Control in the Palm of Your Hand

The ability to remotely control any 6-Series mixer/recorder with easy, wireless operation and larger touchscreen GUIs adds untethered freedom and flexibility on set and in the field. With wireless remote control, via iOS or web-based devices, Sound Mixers can:

- Edit scene names, takes, and notes
- Start and stop recording
- Arm tracks and edit track names
- Circle takes
- Set false takes
- Create sound reports

ⓘ *Although these third-party wireless systems do not initiate sound reports on the actual mixers, they can create sound reports from their own applications' databases. For more information regarding sound report creation on the mixer itself, see "Generating Sound Reports" in the File Storage chapter of this User Guide.*

iOS Wireless Remote Control

All 6-Series mixers support wireless remote control from iOS mobile devices, such as iPhone, iPad, or iPod Touch.

This integration does require the following third-party hardware and software:

HARDWARE / SOFTWARE	DESCRIPTION
:wave	The :wave by Timecode Systems is a highly accurate timecode and genlock generator with integrated RF transceiver and WiFi. Firmware v3.38 or later required. For timecode connection, connect the :wave TC to the mixer's TC via 5-pin Lemo cable (not shown).
	For remote control, use the TCB-40—a 9-pin Lemo® to USB-B cable available from Timecode Systems—to connect the DATA port on the :wave to the 6-Series mixer's USB port.
	When connecting to the CL-12 instead of the mixer, either use the TCB-41—a 9-pin Lemo to USB-A cable (shown) that is available from Timecode Systems—or a USB-B (female) to USB-A (male) adapter.
MovieSlate	From the App Store, download and install the MovieSlate app by PureBlend Software. MovieSlate® v8.5 or later is required, which runs on devices with iOS 8,9 or 10. Also required is the Sound Department PRO, an optional plug-in that is part of the MovieSlate 8 Pro Features available for purchase from within the app or as a monthly subscription.

ⓘ *Refer to Timecode Systems documentation for how to set up the :wave, and PureBlend Software documentation for details on how to use the MovieSlate app and its Sound Department PRO plug-in.*

iOS Remote Control Connection Diagrams

The following diagram shows a direct-to-mixer connection.

The following diagram shows a direct-to-CL-12 connection.

ⓘ   *The CL-12 linear fader controller is an optional accessory for the 6-Series. See the CL-12 Quick Start Guide for information on connecting a CL-12 to a mixer.*

iOS Remote Control Examples

Here is an example of what the app looks like on an iPhone:

Here is an example of what the app looks like on an iPad:

Web-based Wireless Remote Control

All 6-Series mixers support web-based wireless remote control via PC or Mac computers and mobile devices, such as Android or iOS smart phones or tablets, that have a web interface.

This integration does require the following third-party hardware and software:

HARDWARE / SOFTWARE	DESCRIPTION
ACN-ML Master Lockit	The Master Lockit by Ambient® Recording is the control center of the ACN timecode and metadata network. Acting as the network central hub, it enables remote control of all ACN units on set via browser on any WiFi capable device. In addition, it collects all metadata from script, continuity, and professional cameras for delivery and use by DITs and post production.
	Firmware v4.10 or later required.
	For timecode connection, connect the Master Lockit TC to the mixer's TC via 5-pin Lemo cable (not shown).
	Using the MLC-HID—a 5-pin Lemo to USB-A cable, available from Ambient—connect the ACN-ML Master Lockit to the mixer's USB port (or to a CL-12's USB keyboard port).
	When connecting directly to the mixer instead of to the CL-12, a USB A (female) to B (male) adapter is also necessary.
Web Browser	Ensure that your computer or mobile device has a web browser and WiFi.

ⓘ *Refer to Ambient Recording documentation for more information on how to set up the ACN-ML Master Lockit and use its web-based feature for controlling the mixer.*

Web-based Remote Control Connection Diagrams

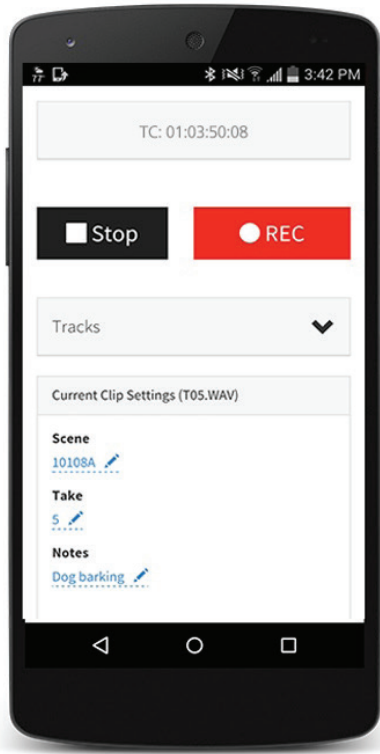The following diagram shows a direct-to-mixer connection.

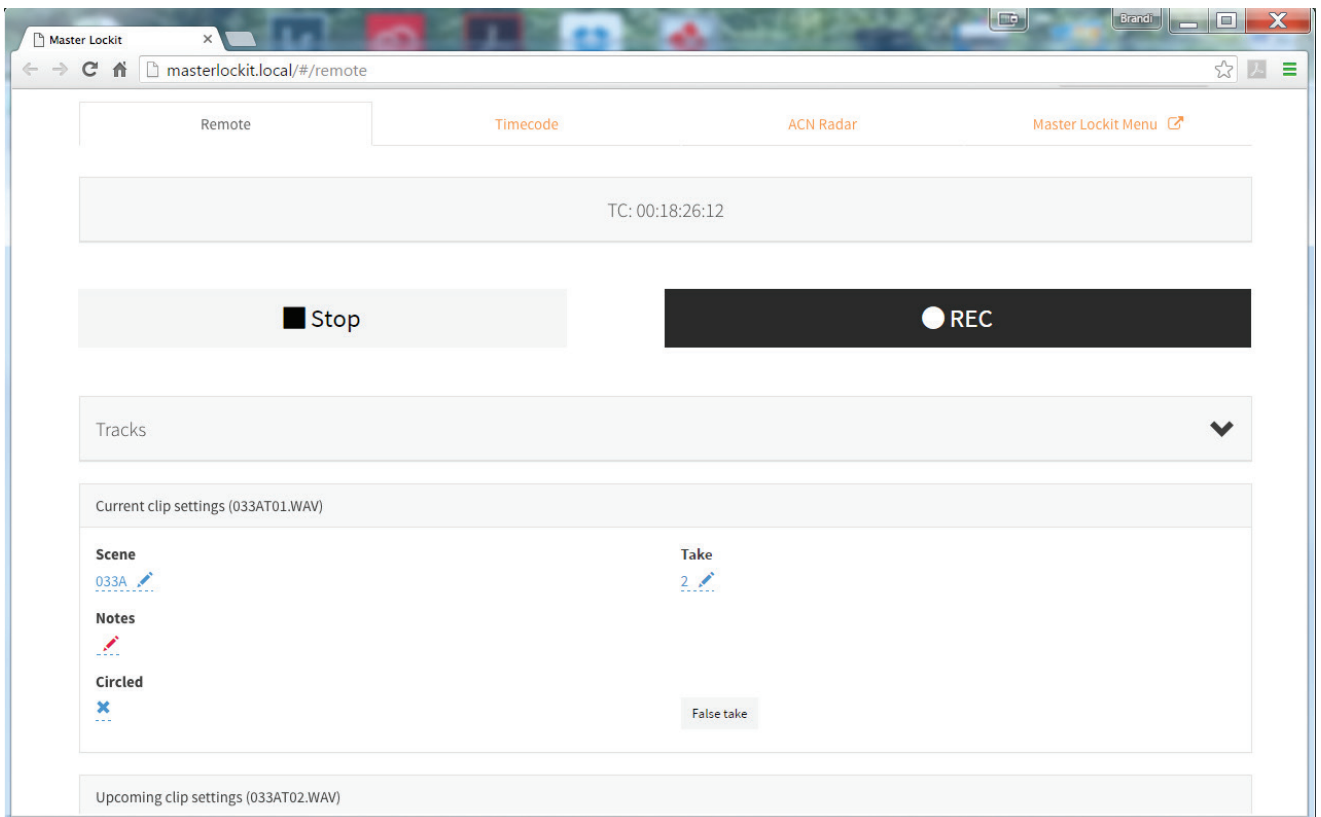The following diagram shows a direct-to-CL-12 connection.

Web-based Remote Control Examples

Here is an example of what the web interface looks like on a smart phone:

Here is an example of what the web interface looks like on a PC:

Specifications

Various product specifications for the 664 are provided here for your convenience. They relate to inputs and outputs, powering, environmental parameters, as well as physical aspects of the mixer.

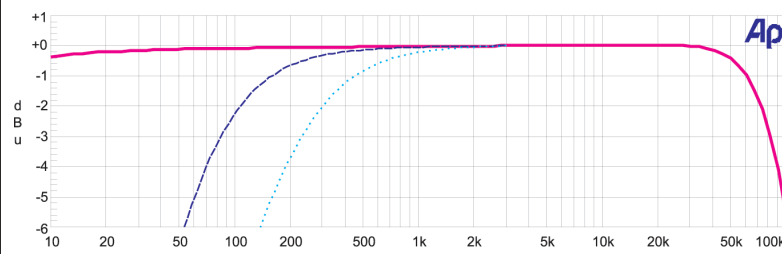Specifications are subject to change without prior notice.

For the latest information available on all Sound Devices products, visit our website at: www.sounddevices.com.

Topics in this section include:
- ▶ **Analog Inputs**
- ▶ **Digital Inputs**
- ▶ **Analog Outputs**
- ▶ **Digital Outputs/Recorder**
- ▶ **Timecode and Sync**
- ▶ **Power**
- ▶ **Environmental**
- ▶ **Dimensions and Weight**

Analog Inputs

NAME	DESCRIPTION
Frequency Response	· 10 Hz to 50 kHz ± 0.5 dB
THD + Noise	· 0.09% max (1 kHz, 22 Hz–22 kHz BW, fader at 0, 0 dBu output)
Equivalent Input Noise	· -126 dBu (-128 dBV) maximum. (22 Hz - 22 kHz bandwidth, flat filter, trim control fully up)
Inputs	· XLR Mic: Active-balanced for use with ≤600 ohm mics · XLR Line: Active-balanced for use with ≤2k ohm outputs · RTN A, B, C (3.5 mm/10-pin): Unbalanced stereo for use with ≤2k ohm outputs · Link I/O: Unbalanced stereo for linking to Sound Devices 664, MixPre-D, 302, 442, and 552.
Input Impedance (ohms actual)	· XLR Mic: 4k ohms · XLR Line: 10k ohms · RTN A, B, C (3.5 mm/10-pin): 30k ohms · Link I/O: 2k ohms
Input Clipping Level	· 0 dBu minimum (trim control fully down)
Maximum Input Level	· XLR-3F Mic: 0 dBu (0.78 Vrms) · XLR-3F Line: +40 dBu (80 Vrms) · RTN A, B, C (3.5 mm/Multi-pin): +24 dBu (12.4 Vrms) · Link I/O: +6 dBu (1.5 Vrms)
Input Limiters	· +16 dBu threshold · 20:1 limiting ratio · 1 mS attack time · 500 mS release time

High-Pass Filters	Sweepable 80 Hz to 240 Hz, 12 dB/oct at 80 Hz 6 dB/octave at 240 Hz | Line Style	Data
Solid	High-Pass Off
Dashes	@ 80 Hz Setting
Dots	@ 240 Hz Setting	
Microphone Powering (each analog Input selectable)	· Dynamic (no power applied) · 12 V Phantom: through 680 ohm resistors, 10 mA per mic available · 48 V Phantom: through 6.8 k resistors, 10 mA per mic available

Digital Inputs

Name	Description
AES3	· Balanced: 110 ohm · Unbalanced: 75 ohm
AES42	· AES42 Mode 1, provides +10 V Digital Phantom Power

Analog Outputs

Name	Description
Output Type, Impedance	· Line (XLR and 10-pin): transformer-balanced for use with >=600 ohms inputs, 100 ohms · -10 (XLR and 10-pin): transformer-balanced for use with >=10k ohm inputs, 3.2k ohms · Mic (XLR and 10-pin): transformer-balanced for use with >=600 ohm inputs, 150 ohms · TA3 Mic/Line: active-balanced, pin-2 and 3 driven, use with >=3k ohm inputs, 1k ohms · TA3 Direct Outs Mic/Line: active-balanced, pin-2 and 3 driven, use with >=3k ohm inputs, 1k ohms · Tape Outs (3.5 mm and TA3-type): unbalanced, stereo, use with >=6k ohm inputs, 1.8k ohms actual · Headphones (3.5 mm and ¼"): unbalanced, stereo, use with 8-2k ohm headphones, 50 ohms actual
Maximum Output Level	· Line (XLR, 10-pin, TA3 Balanced and Direct Outs): +20 dBu (7.8 Vrms) · -10 (XLR, 10-pin): +6 dBu (1.5 Vrms) · Mic (XLR, 10-pin, TA3 Balanced and Direct Outs): -20 dBu (0.078 Vrms) · Tape Outs (3.5 mm and TA3-type): +6 dBu (1.5 Vrms)

Maximum Gain	Typical (Trim, Fader, Master, Phones, RTN A, RTN B, RTN C fully up)			
		MIC Level Input	LINE Level Input	RTN A/B/C
	Master Outs (XLR-3M, 10-pin, TA3) @ LINE	93 dB	53 dB	-
	Master Outs (XLR-3M, 10-pin, TA3) @ -10	79 dB	39 dB	-
	Master Outs (XLR-3M, 10-pin, TA3) @ MIC	53 dB	13 dB	-
	Direct Outs Post-Fade (TA3) @ LINE	87 dB	47 dB	-
	Direct Outs Post-Fader (TA3) @ -10	73 dB	33 dB	
	Direct Outs Post-Fader (TA3) @ MIC	47 dB	7 dB	-
	Direct Outs Pre-Fader (TA3) @ LINE	72 dB	32 dB	-
	Direct Outs Pre-Fader (TA3) @ -10	58 dB	18 dB	-
	Direct Outs Pre-Fader (TA3) @ MIC	32 dB	-8 dB	-
	Tape Out (TA3 and 3.5 mm)	79 dB	39 dB	6 dB
	Headphones (1/4" and 3.5 mm)	107 dB	67 dB	34 dB
Line Output Clipping Level (1% THD)	· 20 dBu minimum with 10k load			
Output Limiters	· Affects outputs of the mixer · Adjustable threshold from +4 dBu to +20 dBu, 1 dB steps · 20:1 limiting ratio · 1 mS attack time · 500 mS release time			

Digital Outputs/Recorder

NAME	DESCRIPTION
AES3 Output:	· AES Out A,B on XLR-3M connectors · AES Out C on Hirose 10-pin connector · 110 ohm, 2 V p-p, AES and S/PDIF compatible with RCA adapter
Sampling Frequency	· 44.1 kHz · 47.952 kHz · 48 kHz · 48.048 kHz
A/D	· 24 bit
A/D Dynamic Range	· 114 dB, A-weighted, typical
Media Type	· Secure Digital Extended Capacity (SDXC) · Secure Digital High Capacity (SDHC) · Secure Digital (SD) · CompactFlash (CF) · FAT32 formatted (<32GB), exFAT for (>32GB), on-board memory card formatting
File Type	· Record: WAV (Broadcast Wave File format), mono- or polyphonic, or MP3 · Playback: WAV (Broadcast Wave File format), mono- or polyphonic, or MP3
Sampling Clock Accuracy	· ± 0.2 ppm

Timecode and Sync

NAME	DESCRIPTION
Modes Supported	· Off · Free Run · External · Rec Run · 24h Run
Frame Rates	· 23.976 · 29.97DF · 30DF · 24 · 29.97ND · 30ND · 25
Accuracy	· Ambient Generator: ± 0.2ppm (0.5 frames per 24 hours) · Holds TC clock for two hours after main battery removal
Timecode Input	· 20k ohm impedance · 0.3 V - 3.0 V p-p (-17 dBu - $+3$ dBu)
Timecode Output	· 1k ohm impedance · 3.0 V p-p ($+12$ dBu)
Sync Input	· Word Clock
Word Clock Output	· Square wave; 3.3 V p-p, 75 ohm, running at sample rate

Power

NAME	DESCRIPTION
External Power Supply	· Isolated (floating) DC input jack, 10-18 V on locking 4-pin Hirose connector, pin-4 = (+), pin-1 = (-) · Mates with gold Hirose #HR10A-7P-4P (DigiKey# HR110-ND) or silver Hirose #HR10-7P-4P (DigiKey# HR100-ND) locking connector
Internal Power Supply	· 5-10 V range. · Accepts 5 AA-sized (LR6) batteries, nominal (NiMH rechargeable recommended) ⓘ *There are similar sized 3+ V Lithium-cells that are not compatible.*

Environmental

NAME	DESCRIPTION
Operation and Storage	· Operating: -20º C to 60º C · Storage: -40º C to 85º C · 0 to 90% relative humidity (non-condensing)

Dimensions and Weight

Name	Description
Size (H x W x D)	· 2.1 in x 12.6 in x 7.8 in · 5.3 cm x 32 cm x 19.8 cm
Weight	· 4 lbs 12 oz (unpackaged, without batteries) · 2.15 kg (unpackaged, without batteries)

Dimensions and Weight

Accessories

The 664 works with various accessories which may be purchased separately and used to further enhance your field mixing and recording experience.

This section is not intended to be an all-inclusive list of accessories available for use with the 664.

For the latest information available on all Sound Devices products and their accessories, visit our website at:

www.sounddevices.com

Topics in this section include:
- ▶ **Electronic Accessories**
- ▶ **Cables and Connectors**
- ▶ **Cases**
- ▶ **Software**

Electronic Accessories

ACCESSORY	PHOTO	DESCRIPTION
CL-12		This optional linear fader controller comes in two models and provides 12 100 mm linear faders, LED metering, and numerous, illuminated dedicated buttons for quick-access to key functionality. With single USB connection to the mixer for both power and control, it enables fast transition between cart- and bag-based workflows._x000D_ The CL-12 Alaia has the same features as the standard model, plus custom wood side panels and Penny & Giles faders for an enhanced mixing experience._x000D_ For more information, see _CL-12 Linear Fader Controller_.
CL-6		This optional input controller attaches to the top or bottom of the 664 and adds six full-sized tactile fader controls, sunlight-viewable LED metering and big, back-lit Record and Stop controls._x000D_ For more information, see _CL-6 Input Controller_.

Cables and Connectors

Accessory	Photo	Description
XL-2		A 25-inch TA3-F to XLR-3M cable, used to connect the TA3 auxiliary outputs to third-party devices with XLR-3F inputs. Each package contains two cables.
XL-2F		A 25-inch XLR-3F to TA3-F cable, used to connect mixers and other devices with XLR-3M outputs to the TA3 7-12 inputs on the 688. Also used to attach standard microphone as auxiliary slate mic. Each package contains two cables.
XL-4		Bag of four (4) TA3-F-type connectors.
XL-10		Hirose 10-pin to two-XLR (balanced L/R) and 3.5 mm plug (stereo return A and C) breakout cable; includes in-line 20-foot extension cable. The XL-10 is a high-quality multi-pin breakout and extension cable designed specifically for Sound Devices field production mixers. It provides easy access to the balanced outputs and to unbalanced stereo return A and C input for headphone monitoring.
XL-H		Bare Hirose 4-pin locking DC connector (HR10-7P-4P).
XL-NPH		An NP-type battery cup with 24-inch cable terminated in Hirose 4-pin locking DC connector (HR10-7P-4P).

ACCESSORY	PHOTO	DESCRIPTION
XL-TA25		TA5F to 3.5 mm TRS, 20-inch cable, used to connect a 664 TA5M Link I/O to the MixPre D or 442 Tape Out/Mix Out 3.5 mm jack for mixer linking.
XL-TA35		TA5F to TA3F, 12-inch cable, used to connect a 664 TA5M Link I/O to the 302 or 442 Tape Out/Mix Out TA3M connector for mixer linking.
XL-TA55		TA5F to TA5F, 12-inch cable, used to link the 664 to another 664 or 552 mixer.
XL-WPH3		The XL-WPH3 is an AC-to-DC (in-line) 100-240V power supply unit with 50/60 Hz input, a 12 VDC 3.75 A (45 W) output, and a Hirose 4-pin DC plug. It comes supplied with a 3-pin IEC cord.

Cases

ACCESSORY	PHOTO	DESCRIPTION
CS-688		This production case, designed by PortaBrace for Sound Devices, may be used for either the 664 or 688 and accessories, such as the CL-6 or the SL-6 (pictured here with the 688 and SL-6). The case has several attached pockets, zippered sides, a removable windowed cover, and is made from durable waterproof nylon, with anti-skid material on the bottom. For more information, see CS-688.
CS-Strap		This medium-duty neck strap with metal hooks was designed by PortaBrace for use with various Sound Devices production cases.

Software

Accessory	Photo	Description
Wave Agent		Sound Devices Wave Agent, a file librarian for computers, provides a comprehensive range of tools for preparing audio files for problem-free passage through complex production workflows. For more a free download, visit: www.waveagent.com

CL-12 Linear Fader Controller

The CL-12 linear fader controller, which comes in two models, is an optional accessory that significantly expands the mixing capability of the 6-Series mixer/ recorder line.

It connects via a USB cable, which provides both power and control of the CL-12, plus a ¼-inch headphone cable to provide both a ground connection to the chassis as well as monitoring from the CL-12. Additional power via a micro USB cable is required when connecting the CL-12 to a 664 or 633.

ⓘ *Procedures for attaching the CL-12 are provided in the* CL-12 Quick Start Guide*.*

Topics in this section include:
▸ **Overview of Panels**
▸ **Altered Functionality**
▸ **Selecting One or More Input Channels**
▸ **Activating PFL of an Input**
▸ **Trim Level Adjustment on 6-Series**
▸ **Routing Input Channels**
▸ **Adjusting Output or Track Levels**
▸ **Disabling Output Controls**
▸ **Arming L, R, X1, X2 Tracks**
▸ **Using the 3-Band Equalizer (688 only)**
▸ **Using High-pass Filters**
▸ **Naming Tracks**
▸ **Configuring User Programmable Buttons**
▸ **Adjusting CL-12's LED Brightness**
▸ **Specifications**

Overview of Panels

The front and back panels of the CL-12 provide a number of connection ports for a variety of purposes. The front panel has two headphone outputs, a ¼-inch and a 3.5 mm TRS jack.

3.5 mm   1/4-inch
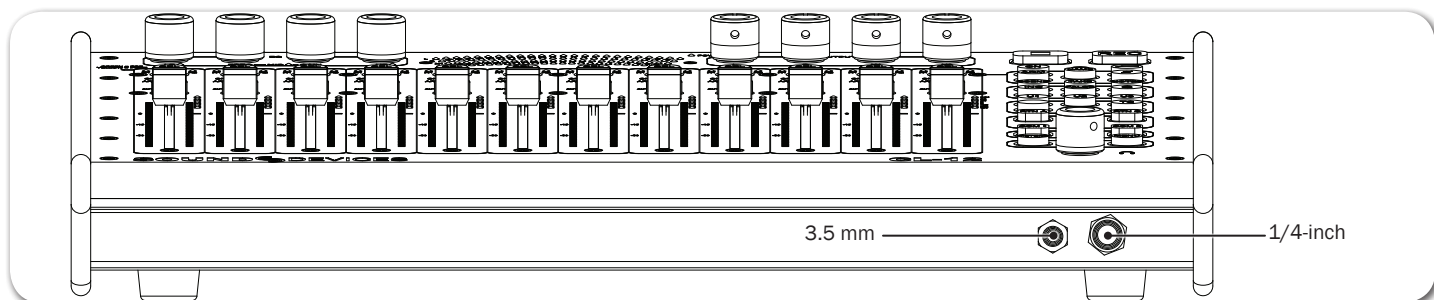
The back panel provides the connections required for attaching the CL-12 to 6-Series mixers, plus ports for other peripherals.

Light   Keyboard   To 6-Series Headphone Out   DC Boost Input (USB 5V)   To 6-Series Mixer

Back Panel

| FEATURE	DESCRIPTION
Light	USB A connection for attaching an external USB light source, useful for illuminating the CL-12 surface in low light conditions.
Keyboard	USB A connection for attaching a peripheral USB keyboard, which can be used for control and entering metadata. This port may also be used to connect third-party systems for wireless remote control of 6-Series mixers. ⓘ *When using an external keyboard, first ensure MENU > System> USB Port is set to USB Host/Keyboard before plugging in the keyboard.*
Headphone Input	A ¼-inch headphone jack for connecting the CL-12 to the mixer's ¼-inch headphone output, making it possible to monitor audio directly from the front of the CL-12. Use the supplied ¼-inch to ¼-inch cable, which adds a low-resistance ground connection to the CL-12 chassis for extra robustness between the mixer and the CL-12 in the event of static shock.
DC Boost Input	Connect a micro USB power cord (not included with the CL-12) to this port (5V) on the CL-12 is required for connecting a CL-12 to either a 664 or 633. When using a CL-12 with a 688, this port is optional, but recommended for providing additional DC power when necessary, such as for powering a high-current-draw USB keyboard. Connecting additional power to this port will also allow for brighter illumination of the CL-12's buttons and LEDs.
To 6-Series Mixer	Connect this USB port on the CL-12 to the mixer's USB B port by using the supplied USB cable. This connection provides both control and power to the CL-12. ⓘ *When the CL-12 is connected, any CL-6 attached to the mixer is disabled.*

The top panel of the CL-12 has an abundance of faders, buttons, LEDs, and controls for an intuitive mixing and control user experience.

Top Panel

Side Panel
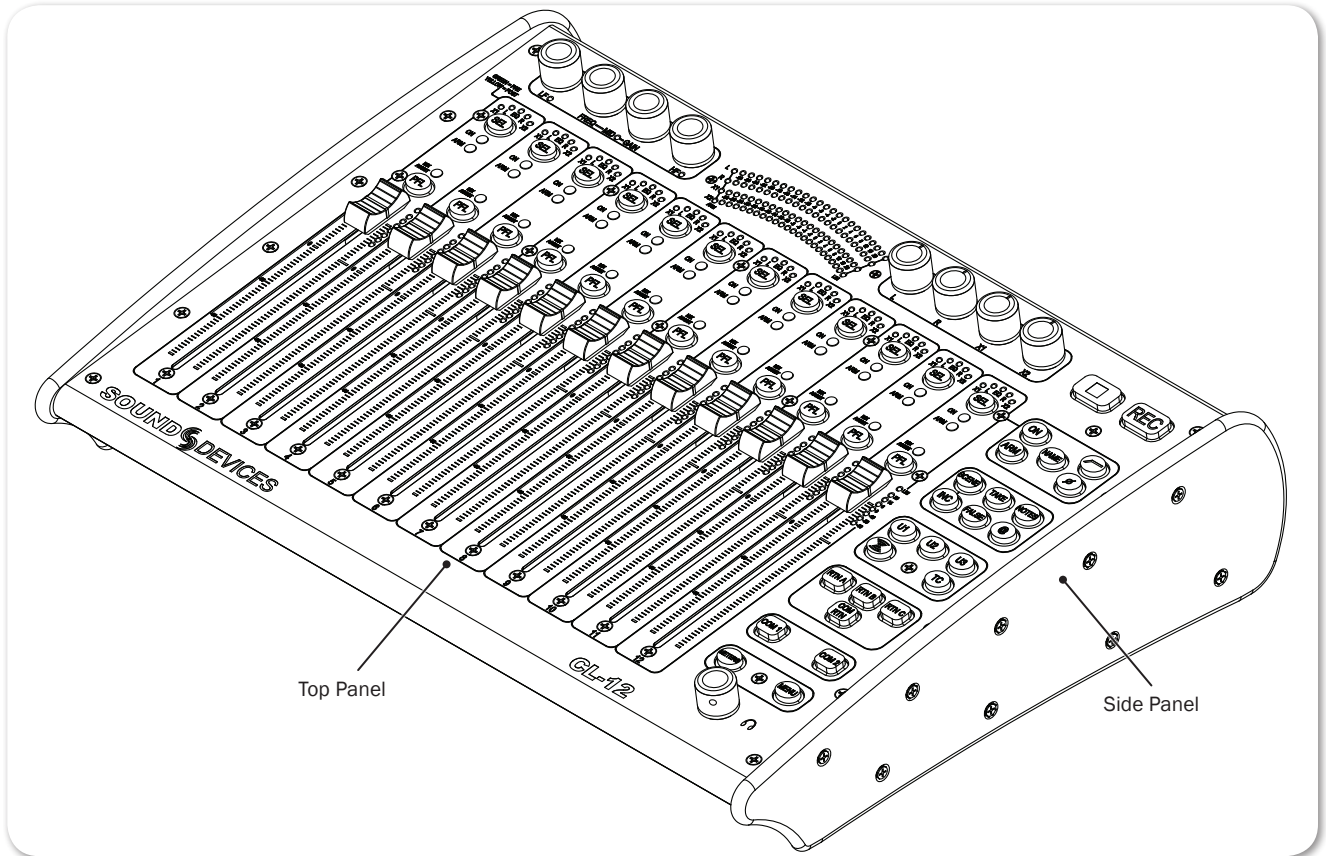
To fully explain each feature of the CL-12's top panel, the mixing surface is divided into three areas:

- Top – comprised of the EQ and OUTPUTS sections
- Left – comprised of the Channel Strip section
- Right – comprised of the Headphone encoder and several sections of buttons for various functions, such as transport control, channel selection, etc.

Top: EQ & Output Sections

Right: Transport Controls

Channel Select Tools

Metadata Controls

Fast Access Buttons

Com & Returns Sections

Meters & Menu

Left: Channel Strip Section

Headphone Encoder
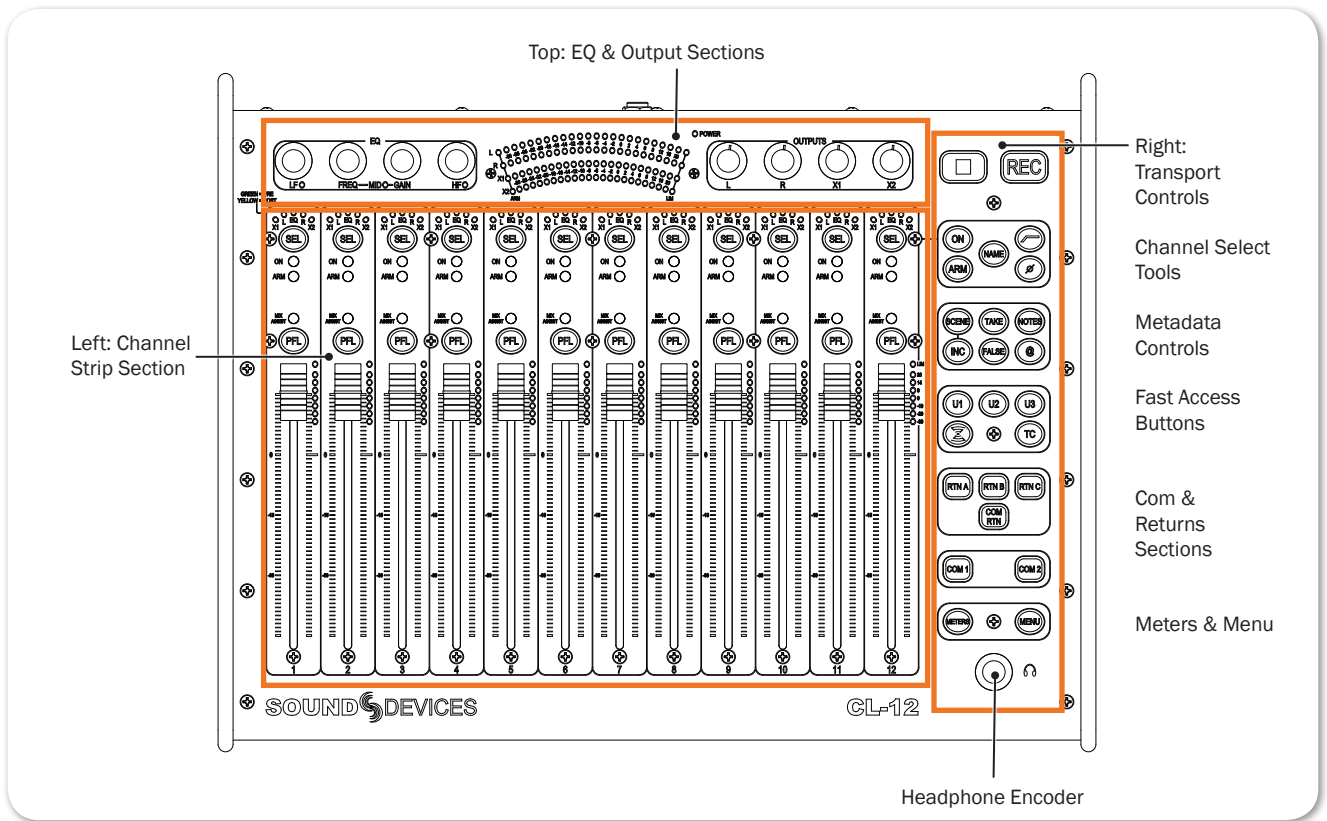
Top: EQ & OUTPUTS Sections

The area that spans the top edge of the mixing surface has rotary controls for EQ and Outputs, as well as LED metering and the Power LED.

EQ Section

OUTPUTS Section

ⓘ *Not all features described here are available with every mixer. For more information, see CL-12 Comparison Chart.*

FEATURE	DESCRIPTION
EQ Controls	There are four rotary encoders in the EQ section. These 3-band EQ controls include LF gain, MID frequency/gain, and HF gain. Other EQ parameters, such as Q-factor and filter type are set up from the CL-12 > EQ sub-menu.
	For more information, see *Using the 3-Band Equalizer (688 only)*, *Bypassing EQ* and *Accessing the EQ Submenu*.

FEATURE	DESCRIPTION
LED Output Meters	Displays 22-segment metering levels, as well as both ARM and LIM (limiter) LEDs for L, R, X1, and X2. ⓘ *LED meters may be configured to display either output or track levels.* For more information, see *Configuring Output Meters (688 only)*.
Power LED	Illuminates green when the CL-12 is powered on via the USB connection to an attached 6-Series mixer.
Output Controls	There are four rotary controls or "pots" in the OUTPUTS section, which may be used for routing as well as adjusting output or track levels. Press to route or arm; turn to adjust level. For more information, see *Adjusting Output or Track Levels* and *Arming L, R, X1, X2 Tracks*.

Left: Channel Strip Section

The area that spans the majority of the mixing surface comprises 12 channel strips. Each strip is comprised of 12 linear faders, SEL and PFL buttons, LED indicators and LED meters. The CL-12's low latency faders allow for responsive level adjustment.
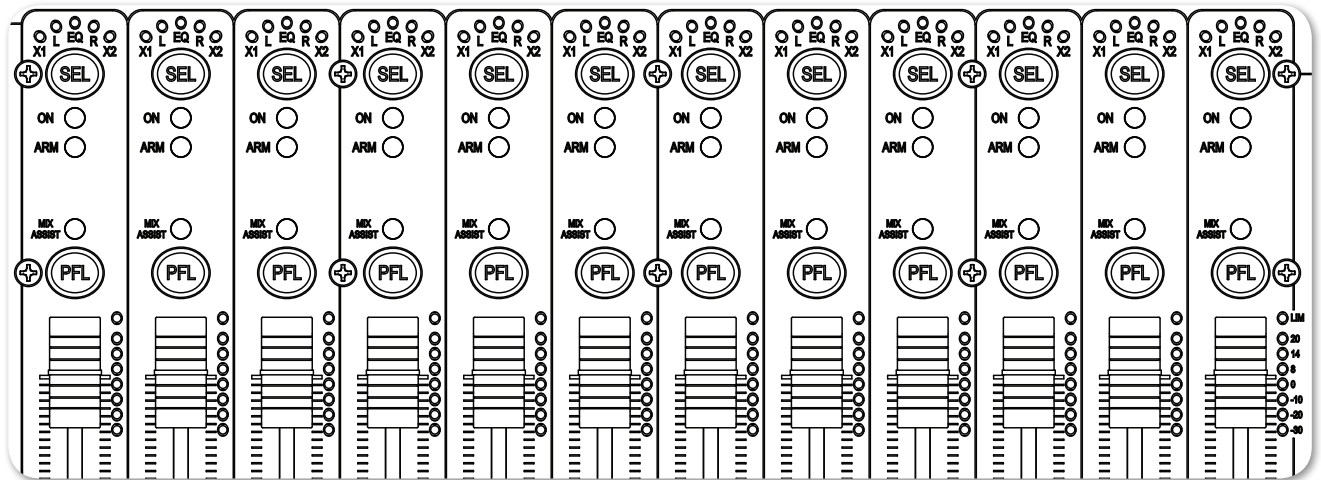

ⓘ *Not all features described here are available with every mixer. For more information, see CL-12 Comparison Chart.*

FEATURE	DESCRIPTION
X1 Routing Indicator	Illuminates when the input channel has been routed to the X1 output. • Off = not routed • Green = pre-fade routing • Yellow = post-fade routing
L Routing Indicator	Illuminates when the input channel has been routed to the left bus. • Off = not routed • Yellow = post-fade routing
EQ LED	Indicates when some form of EQ has been applied to the input channel. Illuminates blue if any LF, MID, or HF EQ band is set to non-zero gain for the selected input.
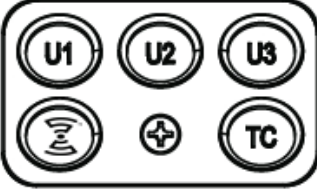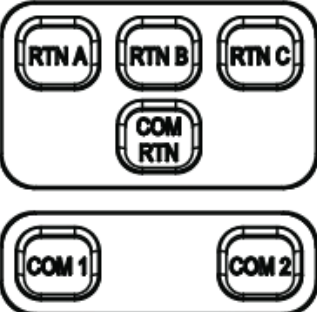
FEATURE	DESCRIPTION
R Routing Indicator	Illuminates when the input channel has been routed to the right bus. • Off = not routed • Yellow = post-fade routing
X2 Routing Indicator	Illuminates when the input channel has been routed to the X2 output. • Off = not routed • Green = pre-fade routing • Yellow = post-fade routing
SEL Button	Selects or deselects an input channel, or multiple input channels for adjustment. Each SEL button illuminates when a channel is selected. While selected, an input channel may be routed to L, R, X1 or X2. It also may be turned on, armed, or named. Additionally, high-pass filtering, phase inversion, or EQ may be applied. For more information, see *Selecting One or More Input Channels*. See also *Setting SEL to follow PFL*.
ON Indicator	Illuminates yellow to indicate the input channel is on.
ARM Indicator	Illuminates red to indicate the corresponding isolated track (ISO) is armed for recording.
MIXASSIST Indicator	Illuminates to indicate auto-mixing activity. When the input is open, the LED is green. As the input closes, the LED is turned off.
PFL Buttons (Pre-/Post-Fade Listen)	Activates or deactivates pre- or post-fade listen of inputs 1-12 to the headphone monitor. For more information, see *Activating PFL of an Input*. See also *Setting SEL to follow PFL*.
Linear Faders	100 mm low latency linear controls for adjusting the fader levels of inputs 1-12. Ranges from Off, - 80 to +16 dB. Each input's linear fader gain is displayed on the mixer's Input Settings screen. Calibrate linear faders to 0 dB via the mixer's SYSTEM > Fader/Pan Calibration menu.
LED Meters	Displays 7-segment pre- or post-fade metering, plus pre- and post-fade limiter LED indicator for input channels 1-12.

Right: Buttons and HP Encoder

The area that spans the right side of the mixing surface has transport controls and numerous buttons for quick access to many key features. For convenience, the buttons are grouped in sections according to common functionality.

ⓘ *Not all features described here are available with every mixer. For more information, see CL-12 Comparison Chart.*

Section	Buttons	Name	Description
Transport Controls		Record	While the Transport Control on the mixer operates normally when the CL-12 is attached, this alternate, backlit Record button provides an additional control for starting a recording.
		Stop	This alternate, backlit Stop button provides an additional control for stopping a recording or playback, or (when stopped) viewing the next take's file name.
Channel Select Tools		ⓘ *Channel Select tools operate on the currently selected channel(s).*	
		ON	Press to toggle a channel on or off. When on, the input's ON LED illuminates yellow.
		ARM	Press to arm or disarm the channel. When armed, the input's ARM LED illuminates red.
		NAME	Press this button to display and edit the currently selected channel's track name. This name is embedded as metadata within the recorded files. ⓘ *This functionality only works when one input is selected. If multiple inputs are selected when the NAME button is pressed, a warning message appears instructing the user to select a single input.*
		HPF	Press to toggle on or off high-pass filtering for a selected input channel. For more information, see *Using High-pass Filters*.
		Phase	Press to toggle the phase of aselected input channels. When inverted, the PHASE button illuminates orange.

SECTION	BUTTONS	NAME	DESCRIPTION
Metadata Controls		ⓘ	*Use the on-screen, virtual keyboard or a USB keyboard plugged into the back panel of the CL-12 to edit metadata.* *All edits update the relevant embedded metadata within the file and file name.*
		SCENE	While recording, press to display and edit the current scene name. While stopped, press to display and edit the next scene name. Press SCENE again to save and exit.
		TAKE	While recording, press to display and edit the current take's Take number. While stopped, press to display and edit the next take's Take number. Press TAKE again to save and exit, or select Done.
		NOTES	While recording, press to display and edit the current take's Notes. While stopped, press to display and edit the next take's Notes. Press NOTES again to save and exit. ⓘ *Hold NOTES button down for 1 second to view Phrase List screen.*
		INC	Increments the scene name according to settings configured via File Storage > Scene Increment Mode.
		FALSE	Moves last take to the False Takes folder and decrements the take number by 1.
		@	Toggles the circle status of the current take, which prepends the "at" symbol (@) to file name and updates the file's metadata to "circled."
Fast Access		U1, U2, U3	User definable buttons. These may be configured to many different functions in the CL-12 sub-menu.
		SuperSlot	Displays the SL-6 Receiver Overview screen, should an SL-6 by connected.
		TC	Displays the Timecode Jam menu.
COM & Return Controls		RTN A, RTN B, RTN C	Press the button corresponding to the A, B, or C return feed to be monitored in the headphones.
		COM RTN	Press to monitor COM return in the headphones.
		COM 1, COM 2	Activates the selected COM (1 or 2) ⓘ *Both may be operated simultaneously.*

Section	Buttons	Name	Description
Meters & Menu		METERS	Duplicates the functionality of the mixer's METERS button.
		MENU	Duplicates the functionality of the mixer's MENU button.

Altered Functionality

When the CL-12 is connected to a 6-Series mixer, some mixer functionality is changed. The following table indicates the functionality and which mixers are affected.

Functionality	688	664	633
New CL-12 submenu is enabled	✓	✓	✓
INPUTS > PFL Toggle Mode submenu is disabled ⓘ *On the 664, the submenu is called INPUTS > Input Mode.*	✓	✓	✓
Rotary faders (1-6) disabled	✓	✓	✓
Rotary faders (7-12) become trim controls for (7-12)	✓	—	N/A
L, R, X1, X2 adjustment via SELECT encoder is disabled	✓	✓	✓
CL-6 Rotary faders (7-12) disabled	✓	✓	N/A

Feature Comparison Chart

Feature availability is contingent on the model of the mixer to which the CL-12 is connected. The following table outlines the differences between the various 6-Series models.

CL-12 Feature	688	664	633
Number of linear faders	12	12	6
DC Boost micro USB power connection	Optional	Required	Required
3-band semi-parametric equalizer	✓	—	—
Auto Mixer Metering and Control	✓	—	—
SuperSlot Control	✓	—	—
COMs	1 & 2	1	—
Returns	A,B,C	A,B,C	A
Slate + Tone (via User Programmable buttons)	✓	✓	✓
SL-6 Routing (via User Programmable buttons)	✓	—	—
LR, X1, X2 Track Level Control & Metering	✓	✓	✓
Physical LR, X1, X2 Output Level Control & Metering	✓	—	—
7-segment PFL Metering + Limiter Activity	✓	✓	✓
Channel On/Off	✓	✓	✓
Headphone Level & Preset	✓	✓	✓
HPF Control	✓	7-12 only	✓

CL-12 FEATURE	688	664	633
Input Phase Control	✓	ch 2,4,6 only	ch 2 only
Input PFL and SEL Controls	✓	✓	✓
Input Routing to LR, X1, and X2	✓	✓	✓
Menu Control	✓	✓	✓
Metadata Control	✓	✓	✓
Track Arming & Naming	✓	✓	✓
Transport Control	✓	✓	✓
USB Peripherals (Light & Keyboard)	✓	✓	✓
User Programmable buttons (U1, U2, U3)	✓	✓	✓

CL-12 Sub-menu

When the CL-12 is attached to a 6-Series mixer, a new CL-12 sub-menu is available via the Main menu. Options in the menu will vary based on the mixer's model. For instance, the left image, shown below, is the menu as it appears on a 688. The right image is the menu as it appears on a 664 or 633.
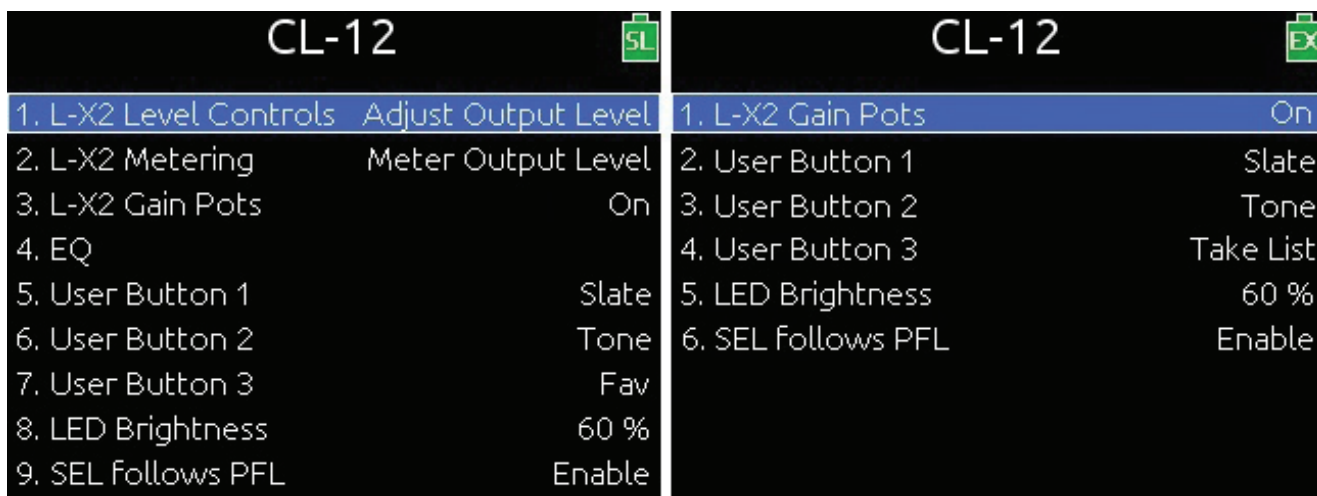
OPTION	DESCRIPTION
L - X2 Level Controls	Configure level controls to control either output or track levels. Since the 664 and 633 only allow for control of track levels, this menu option is not available when a CL-12 is connected to them. For more information, see *Adjusting Output or Track Levels*.
L - X2 Metering	Configure LED meters to display either output or track levels. Since the 664 and 633 only allow for metering of track levels, this menu option is not available when a CL-12 is connected to them. For more information, see *Configuring Output Meters (688 only)*.
L - X2 Gain Pots	Enables/disables the L, R, X1 and X2 controls on the CL-12 (OUTPUTS section).
EQ	Displays submenu related to EQ, a feature only available with the 688. For more information, see *Accessing the EQ Submenu*.
User Button 1	Set function of U1 button.
User Button 2	Set function of U2 button.

OPTION	DESCRIPTION
User Button 3	Set function of U3 button. For more information, see *Configuring User Programmable Buttons*.
LED Brightness	Set brightness of CL-12 LEDs. For more information, see *Adjusting CL-12's LED Brightness*.
SEL follows PFL	Enables or disables automatic selection of an input channel when its PFL button is pressed. When enabled, pressing PFL will illuminate both the PFL and SEL button for the chosen input channel. For more information, see *Setting SEL to follow PFL*.

Selecting One or More Input Channels

Input channels may be selected individually or as a group for group adjustment. One or more input channels may also be added to any previously selected group. Parameters that can be adjusted when an input channel's SEL button is selected are: ON, ARM, NAME, HPF, PHASE, EQ, and Routing to L, R, X1, X2.

ⓘ *NAME and EQ can only be adjusted for a single channel.*

To select an input channel:

▶ Press the input's SEL button.

ⓘ *Press the input's SEL button again to deselect it, or press any other SEL button to change selection.*

To select multiple input channels, do either of the following:

▶ Simultaneously press multiple SEL buttons.
▶ Press and hold one SEL button down while then pressing one or more SEL buttons for other required inputs.

ⓘ *Press any single illuminated SEL button to simultaneously deselect the group.*

To add more input channels to a selected group:

▶ Press and hold an illuminated SEL button while pressing any additional SEL buttons to add those input channels to the group.

Activating PFL of an Input

Pre- or post-fade listen may be activated on one input at a time.

To PFL an input:

▶   Press the input's PFL button.

There are two modes of PFL: momentary and latching.

MODES	DESCRIPTION
Momentary	If the PFL button is held for greater than one second, PFL only remains active for as long as the button is held. The mixer's LCD does not change screen.
Latching	If the PFL button is quickly tapped, PFL is "latched" on until the PFL button is tapped again or another is selected. When active, the PFL button illuminates, and the Input Settings screen for the active PFL input is displayed on the mixer's LCD.

Setting SEL to follow PFL

The CL-12 provides the SEL follows PFL option for automatic selection of an input channel when its PFL button is pressed. Think of SEL follows PFL as a fast, one-touch method for gaining access to PFL, the Input Settings screen, EQ, routing, and channel select tools. This feature may be disabled so that PFL activation and input channel selection are independent.

To enable or disable SEL follows PFL:

1.   Press MENU.

2.   Select CL-12 > SEL follows PFL.

3.   Select one of two options: Enable and Disable.

Trim Level Adjustment on 6-Series

For inputs 1 through 6, on either the 688 or the 664, trim is still adjusted via the dedicated rotary Trim controls on the mixer, even when the CL-12 is attached. Likewise, on the 633, for inputs 1 through 3, trim is adjusted via the dedicated rotary Trim controls.

However, trim level adjustment of other inputs varies depending on the different designs of each 6-Series mixer to which the CL-12 is attached. For instance, adjusting trim on input 7 of a 688 is not the same as adjusting trim on input 7 of a 664.

The following sub-sections provide details and procedures for adjusting trim levels on inputs 7-12 on the 688, inputs 7-12 on the 664, and inputs 4-6 on the 633.

Adjusting Trim Levels (688 only)

When the CL-12 is attached to the 688, the mini-faders on the 688 become dedicated trim controls for inputs 7-12.

To adjust the trim level for inputs 7-12:

▶ Turn the appropriate mini-fader on the 688. The trim gain is displayed on the mixer's LCD via the Input Settings screen.

Pan

Trim (1-6)

Mini-Fader (7-12) becomes Trim when CL-12 is connected
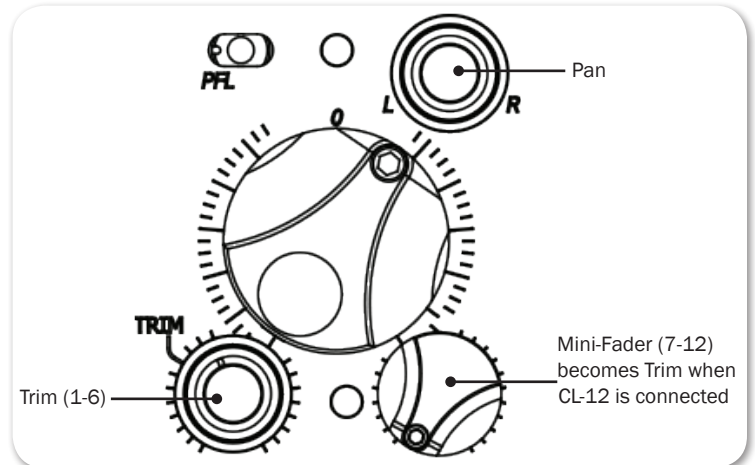
Adjusting Trim Levels (664 only)

When the CL-12 is attached to the 664, the mixer's SELECT encoder may be used to adjust trim for inputs 7-12 via the Input Settings screen.

To adjust the trim level for inputs 7-12:

1. Slide the input's PFL switch on the CL-6 to the right to access the Input Settings screen on the mixer's LCD.

2. Turn the SELECT encoder to adjust trim for the input. The trim gain is displayed on the mixer's LCD.

Adjusting Trim Levels (633 only)

When the CL-12 is attached to the 633, the mini-faders on the 633 become dedicated trim controls for inputs 4-6.

To adjust the trim level for inputs 4-6:

▶ Turn the appropriate mini-fader on the 633. The trim gain is displayed on the mixer's LCD via the Input Settings screen.

Pan

Trim (1-3)

Mini-Fader (4-6) becomes Trim when CL-12 is connected
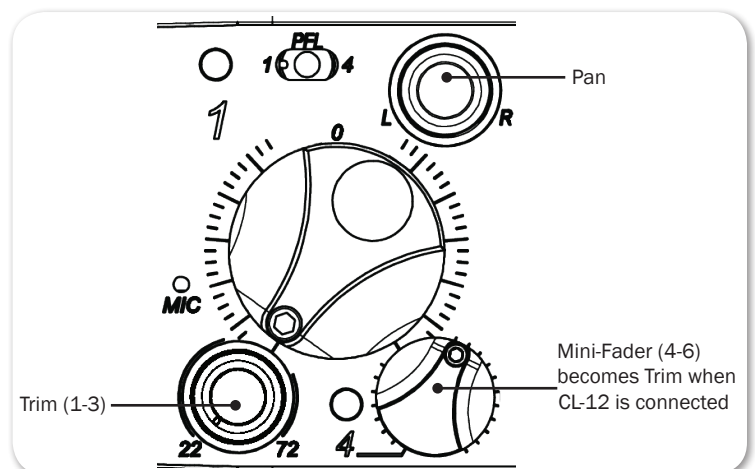
Routing Input Channels

With the CL-12, routing input channels to the left or right mix bus and the X1 or X2 output is quick and easy.

To route an input channel or multiple input channels:

1. Do either of the following:
    ▶ Press the input channel's SEL button.
    ▶ Select multiple input channels, using their SEL buttons.

2. Press the L, R, X1 or X2 output control to route to L, R, X1 or X2, respectively.

    Routing to X1 or X2 can be pre- or post-fade. Press the X1 or X2 output control to cycle through the options: Route Off, Route Pre-fade, Route Post-fade. When routing is pre-fade, the X1 and X2 LEDs illuminate green. When routing is post-fade, the LEDs are yellow.

ⓘ *Alternatively, you can press and hold an L, R, X1, or X2 control, and then press one or more SEL button(s) for the input channel(s) you want to route to that output.*

ⓘ *TIP: For continuous pan control, set an input channel's routing to both L and R, then use the Pan control on the 6-Series mixer to smoothly adjust pan. This will ensure that an input's pan position will be retained when disconnecting and reconnecting the CL-12.*

Adjusting Output or Track Levels

The CL-12 has four rotary controls labeled OUTPUTS that are used for adjusting either output or track levels, based on which mixer is connected to the CL-12 and how the controls are configured.

On the 633 and 664, the CL-12's Output controls are used for adjusting track levels for L, R, X1, and X2.

On the 688, however, the CL-12's Output controls may be configured to adjust either output or track levels for L, R, X1, and X2.

To configure CL-12 output controls:

1. Press MENU to access the 688's Main menu.

2. Select CL-12 > L - X2 Level Controls.

3. Select one of two options: Adjust Output Level or Adjust Track Level.
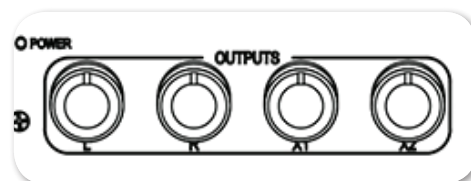
To adjust levels:

▶ Turn the Output control corresponding to which level you want to adjust: L, R, X1, or X2. The level value is displayed on the mixer's LCD in the HP field.

ⓘ *When L and R are linked, L controls level for the L/R output pair. When X1 and X2 are linked, X1 controls level for both. Also, when linked, the R and X2 controls are disabled. (Output linking control is in the OUTPUT menu.)*

Configuring Output Meters (688 only)

On a 688, the LED output meters on the CL-12 may be configured to meter L, R, X1, and X2 output or track levels. For other 6-Series mixers, the 22-segment output metering on the CL-12 is always for track levels.

To configure CL-12 output meters:

1. Press MENU to access the 688's Main menu.
2. Select CL-12 > L - X2 Metering.
3. Select one of two options: Meter Output Level or Meter Track Level.

Disabling Output Controls

The 6-Series mixers, when attached to a CL-12, has a sub-menu option that lets users disable the rotary output level controls for L, R, X1, and X2 to avoid accidental changes in level.

To disable the output controls on the CL-12:

1. Press MENU.
2. Select CL-12 > L-X2 Gain Pots.
3. Select Off. This setting is On by default.
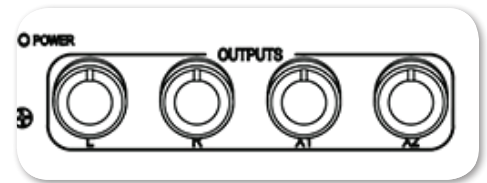
ⓘ *Even when disabled, users can still route to L, R, X1, and X2 by pressing in the controls (pots). Also, disabling the CL-12 output level controls does not impact controls on the mixer. Attenuation of output may still be achieved via the mixer.*

Arming L, R, X1, X2 Tracks

With the CL-12, L, R, X1 and X2 may be armed for recording, or unarmed.

To arm L, R, X1, X2 tracks for recording:

1. Press and hold down the ARM button.
2. Press the rotary OUTPUT control(s) corresponding to the output track(s) you want to arm.

   When armed, each output track's ARM LED illuminates red.

Using the 3-Band Equalizer (688 only)

The CL-12 adds 3-band EQ to the 688. EQ is only available when sample rate is 48.048 kHz or less, and it is only available for adjustment when CL-12 is connected.

- LF is a fixed 100 Hz EQ by default, with +/- 12 dB gain adjustment. The default may be altered via settings in the EQ submenu.
- MID provides variable EQ frequency adjustment over 400 Hz – 6k range with +/- 12 dB gain adjustment.
- HF is a fixed 10 kHz EQ by default, with +/- 12 dB gain adjustment. The default may be altered via settings in the EQ submenu.

ⓘ *When CL-12 is disconnected, the EQ settings are retained, but they cannot be adjusted. For more information, see Accessing the EQ Submenu.*

To adjust EQ for a selected input, do any of the following:

▶ Turn the LF encoder to adjust the selected input's low frequency gain.

▶ Turn the FREQ encoder to adjust the selected input's MID frequency.

▶ Turn the GAIN encoder to adjust the selected input's MID gain.

▶ Turn the HF encoder to adjust the selected input's high frequency gain.

Above the SEL button for each input, the EQ LED illuminates blue when any of the LF, MID, or HF are set to non-zero gain, giving a quick global indication that some form of equalizer is applied to the input(s).

If a selected input has LF applied, the LF LED illuminates orange.

If a selected input has MF applied, the MID LED illuminates yellow, and if a selected input has HF applied, the HF LED illuminates green.
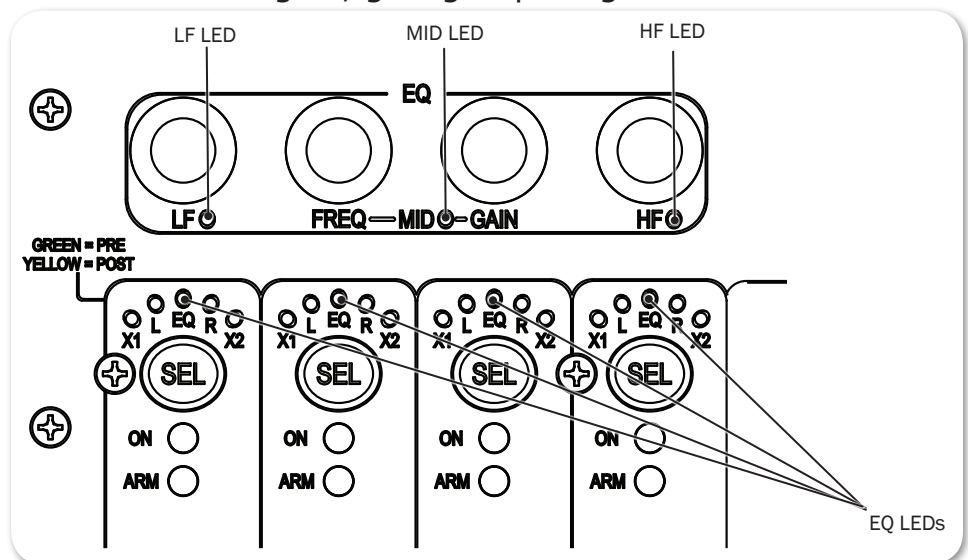
When EQ is applied to a selected input, the EQ screen also appears for the selected input on the mixer's LCD. For instance, in the following example, EQ is applied to channel 1 (CH-1); LF is set at 10 dB and HF is set to -10 dB, while MID frequency and gain are bypassed. In the example, high-pass filtering is off, the Q-factor is set to 1.0 and both LF and HF filtering is set to Peaking.
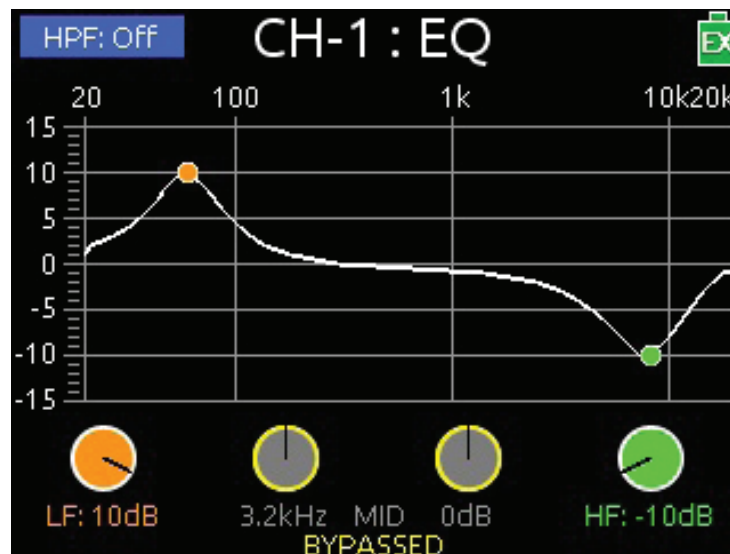
It is not possible to adjust EQ for multiple inputs at the same time. When multiple input channels are selected, the channel that is adjusted will be the last one added to the group.

There is a 10-second timeout on the EQ screen, if nothing is adjusted.
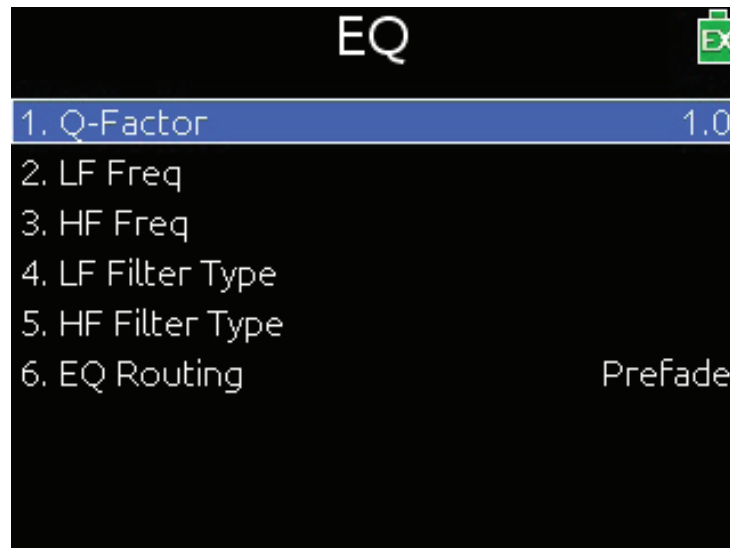
ⓘ *Press and hold an input's SEL button while pressing any of the EQ encoders to view the input's EQ screen without changing the input's EQ value.*

Accessing the EQ Submenu

Several settings related to EQ—such as Q-factor, EQ routing, and so forth—may be configured via the EQ submenu.

To access the EQ submenu:

1. Press MENU.
2. Select CL-12 > EQ. The EQ submenu appears.

Option	Description
Q-Factor	Set to one of four values: 0.707, 1.0, 1.414, 2.0. This affects all EQ bands. For more information, see *Setting the Q-Factor.*
LF Freq	Values range from 60 Hz to 300 Hz. Default is 100 Hz. This may be adjusted individually for each channel.
HF Freq	Values range from 8 kHz to 16 kHz. Default is 10 kHz. This may be adjusted individually for each channel. For more information, see *Setting LF and HF Frequency Defaults*.
LF Filter Type	Set to either Peaking or Shelving. This may be adjusted individually for each channel.
HF Filter Type	Set to either Peaking or Shelving. This may be adjusted individually for each channel. For more information, see *Setting LF and HF Filter Types*.
EQ Routing	Set to either Pre-fade or Post-fade. This affects all input channels. For more information, see *Setting EQ Routing*.

Bypassing EQ

When necessary, it is possible to temporarily and quickly bypass the application of EQ without altering the current non-zero gain value. The label BYPASSED is shown on the EQ screen for any band that is bypassed.

To bypass EQ do any of the following:

▶ Press the LF encoder.

▶ Press the FREQ or GAIN encoder.

▶ Press the HF encoder.

These controls act as toggles between bypass (gain = 0 dB) and the last non-zero gain value, so pressing any encoder a second time will toggle off bypass and reapply the last non-zero gain value for LF, MID, or HF respectively.

When an EQ band is bypassed, its EQ LED goes out.

Setting the Q-Factor

The Q-factor controls the bandwidth that will be cut or boosted by the equalizer.

To set the Q-factor:

1. Press MENU.

2. Select CL-12 > EQ > Q-Factor.

3. Select one of the following options: 0.707, 1.0, 1.414, or 2.0.

   The lower the setting, the wider the bandwidth, which means more frequencies will be affected by EQ. The higher the setting, the narrower the bandwidth, so the EQ adjustment wil be more selective.

   For example, the following two images show a 10 dB LF peaking filter applied to CH-1; however, the Q-factor for the left one is set to 0.707, while the Q-factor for the right one is set to 2.0.
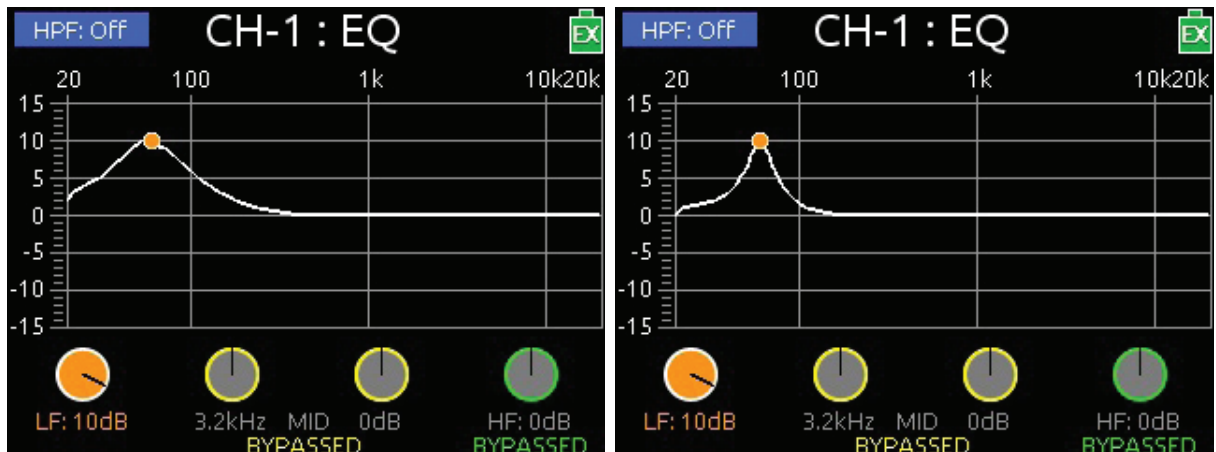
Setting LF and HF Frequency Defaults

The default for LF is 100 Hz and the default for HF is 10 kHz, but both may be adjusted for each individual input via setting in the EQ submenu.

To adjust LF and HF Freq. defaults:
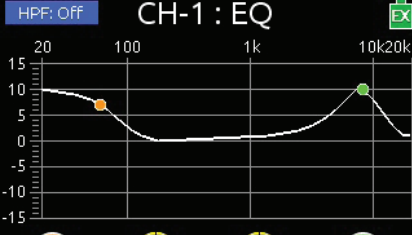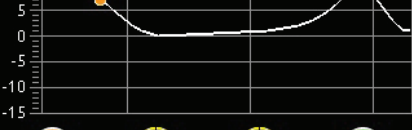
1. Press MENU.
2. Select CL-12 > EQ.
3. Do the following:
   - ▶ Select LF Freq and set a new value. Options include values in increments of 10 from a minimum 60 Hz to maximum 300 Hz.
   - ▶ Select HF Freq and set a new value. Options include values in increments of 10 from a minimum 8 kHz to maximum 16 kHz.

Setting LF and HF Filter Types

The CL-12's EQ offers two types of filters: Peaking and Shelving, and these may be adjusted individually for each input.

FILTER	SAMPLE IMAGE	DESCRIPTION
Peaking		A peaking filter will create a hill- or peak-like boost or cut around a particular frequency. The spread of the "peak" will vary based on the Q-factor.
Shelving		A shelving filter will slope up or down to a particular point and remain constant at its level of boost or cut.
		The sample image shows examples of both shelving (LF) and peaking (HF).

To set type of LF and HF filters:

1. Press MENU.
2. Select CL-12 > EQ.
3. Do the following:
   - ▶ Select LF Filter Type and set each input to either Peaking or Shelving.
   - ▶ Select HF Filter Type and set each input to either Peaking or Shelving.

Setting EQ Routing

EQ may be applied either pre- or post-fade. This setting globally affects all inputs.

To set EQ routing:

1. Press MENU.
2. Select CL-12 > EQ > EQ Routing. Options include: Pre-fade or Post-fade.

Using High-pass Filters

The High-pass Filter (HPF) button on the CL-12 is a toggle, which turns the high-pass filter off or on for the selected input.

On the 664, since inputs 1-6 are analog, the CL-12's HPF button toggles on or off high-pass filtering for inputs 7-12 only at the fixed frequency of 150 Hz.

On the 688 and 633, the high-pass filter may be adjusted for all inputs to other frequencies.

To turn on and adjust an input's high-pass filter:

1. Select an input, using the input's SEL button.
2. Press the HPF button.

ⓘ *If inputs 1-6 are selected on the 664 when the CL-12's HPF button is pressed, a message will appear: "Use the low-cut control on the 664 front panel."*

The HPF button illuminates when high-pass filtering is on.

3. (633 & 688 only) Adjust the HPF value via the Input Settings screen.

    When high-pass filtering is on, the HPF value is fixed at 150 Hz on the 664, but may be changed via in the Input Settings screen on the 633 or 688. Also, on the 688, the EQ screen appears on the mixer's LCD. The Headphone encoder may be used as an alternative way to adjust the HPF value displayed on the EQ screen.

ⓘ *Press the HPF button again to turn off the high-pass filter.*

Naming Tracks

Since inputs are hard-wired to their respective tracks, the input name is the same as the track name. Naming functionality only applies to one selected input at a time. Attempting to do so with multiple inputs selected will result in a message instructing the user to select a single input before continuing.

While recording, the current take's track name may be modified. Edits to the track name in the current take will also be applied to the next take and subsequent recordings that follow. The next take's track name may be edited so long as recording is stopped.

To enter or edit track names:

1. With a single input selected, press the NAME button. The Track Name List appears over the Meters View.

2. Do any of the following:
   ▶ Select Edit Entry to edit the current entry.
   ▶ Select Add New Entry to enter a new track name.
   ▶ Select a name from the list.

ⓘ *TIP: Prepare a list of names to use for fast selection during production.*

Configuring User Programmable Buttons

The CL-12 offers three user programmable buttons for quick-access to a wide range of functions and menus.

To configure U1 – U3 buttons:

1. Press MENU.

2. Select CL-12 > User 1-3 buttons.

3. Select an option to assign to the button. The following table shows possible options and whether they are available with the different 6-Series mixers:

OPTION	DESCRIPTION	688	664	633
Take List	Displays the Take List screen.	✓	✓	✓
File List	Displays the File List screen.	✓	✓	✓
Play	Toggles between play and pause.	✓	✓	✓
FFWD	Fast forward or skip to next file.	✓	✓	✓
REW	Rewind or skip to previous file.	✓	✓	✓
Slate	Toggles slate on and off.	✓	✓	✓
Tone	Toggles tone on and off.	✓	✓	✓
FAV	Duplicates the action of the FAV switch.	✓	—	✓
Select	Duplicates the action of pressing the Select encoder.	✓	✓	✓
Default Playback Card	Shortcut to FILE STORAGE > Default Playback Card sub-menu.	✓	✓	✓
Power Menu	Displays the POWER settings.	✓	—	✓
Input Delays	Displays the Input Delays screen.	✓	—	✓
Output Delays	Displays the Output Delays screen.	✓	—	✓
LR Linking	Toggles linking of L and R.	✓	✓	✓
X1/X2 Linking	Toggles linking of X1 and X2.	✓	✓	✓
Auto Mixer	Toggles the Auto Mixer (MixAssist or Dugan) on and off.	✓	—	—
Return Loopback Mode A - C	Three options: Enters Return Loopback modes for either RTN A, RTN B, or RTN C, respectively.	✓	—	—
SLATE ROUTING	Displays the Slate Routing screen.	✓	—	✓

OPTION	DESCRIPTION	688	664	633
TONE ROUTING	Displays the Tone Routing screen.	✓	—	✓
Timecode Menu	Displays the Timecode/Sync menu.	✓	✓	✓
Daylight Mode	Toggles daylight mode.	✓	✓	✓
Create Sound Report	Creates a sound report (.csv file).	✓	✓	✓
Sound Report Info	Displays the Sound Report Info screen.	✓	✓	✓
X1 - X6 Routing	Six options: Each one is a shortcut to OUTPUTS > X1-X6 Routing > X1 Routing, X2 Routing, and so forth, respectively.	✓	—	X1-X4 only
SL-6 Routing	Displays the SL-6 Routing screen.	✓	—	—
AES Routing	Displays the AES Output Routing screen.	✓	✓	✓
EQ Menu	Shortcut to CL-12 > EQ sub-menu.	✓	—	—
LF Freq	Displays the EQ LF FREQ settings.	✓	—	—
HF Freq	Displays the EQ HF FREQ settings.	✓	—	—

Adjusting CL-12's LED Brightness

Depending on the work environment, the brightness of the CL-12's LED may require adjustment.

To adjust LED brightness:

1. Press MENU.

2. Select LED Brightness.

3. Turn the Headphone encoder to adjust value up or down in 1% increments from a minimum of 5% up to 100%.

ⓘ *TIP: LED brightness may be further boosted by connecting a USB 5 V source to the DC Boost Input port on the back panel of the CL-12.*

Specifications

The following specifications apply to the CL-12.

NAME	DESCRIPTION	
External Power	• Powered by the mixer via USB cable • 5V micro USB DC boost input (required for use with 664 or 633)	
Current Draw	• 90mA @5V typical	
Light	• 100 mA (when powered by 688) • 500 mA (when powered with external USB power supply)	
Size (W x D x H)	**CL-12** • 14.7 in x 11.3 in x 3.8 in • 37.3 cm x 28.7 cm x 9.6 cm	**CL-12 Alaia** • 15.2 in x 11.3 in x 3.8 in • 38.6 cm x 28.7 cm x 9.6 cm
Weight	• 5 lbs • 2.27 kg	• 5 lbs • 2.27 kg

CL-6 Input Controller

The CL-6 input controller is an optional, input-expansion accessory available for use with Sound Devices 688 or 664.

The CL-6 adds dedicated front panel controls, including six full-sized fader controls, PFL control, and high-pass filter controls for inputs 7 through 12. Other features include large, daylight viewable LED track meters with track arm indicators for tracks L, R, X1 and X2, plus additional recording controls.

ⓘ *Instructions for attaching the CL-6 to a mixer are provided in the CL-6 Quick Start Guide, shipped with the accessory. The guide is also available for download as a PDF from the Sound Devices website.*

Topics in this section include:
‣ **Front Panel**
‣ **Top and Bottom Panels**
‣ **Trim Levels (688 only)**
‣ **Trim Levels (664 only)**
‣ **Using High-pass Filters**
‣ **Quick Routing of L and R Tracks**
‣ **Specifications**

Front Panel

The front panel has the following features:
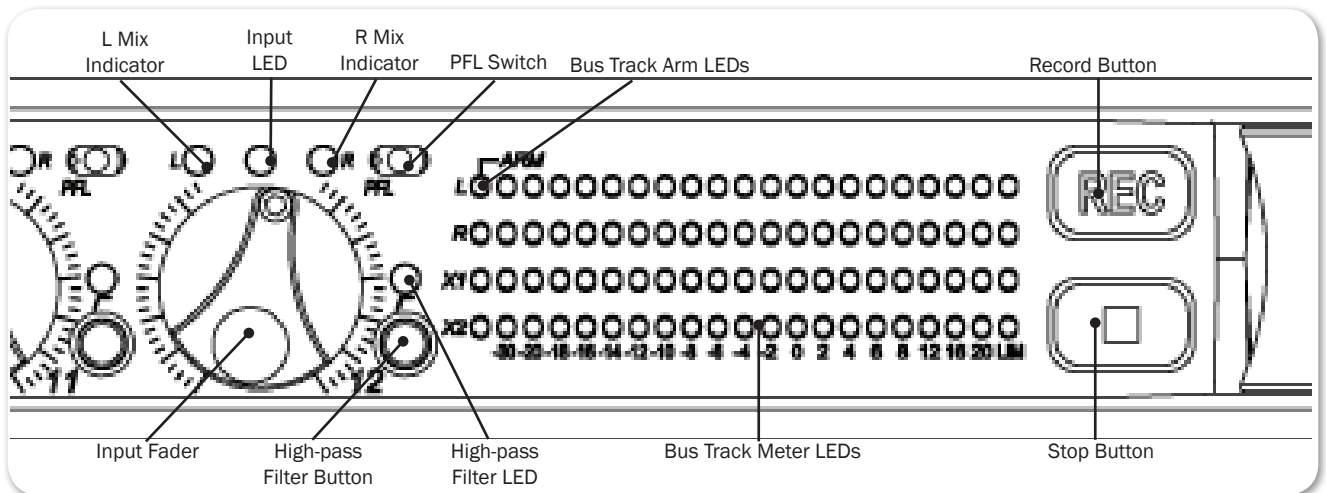
FEATURE	DESCRIPTION
Input Fader	Primary control for adjusting the fader levels of inputs 7-12. Ranges from OFF to +16 dB. Nominal setting is in the middle (0 dB).
High-pass Filter Button	Toggles activation of high-pass filter, per channel.
High-pass Filter LED	Illuminates amber to indicate high-pass filter is engaged, per channel.

FEATURE	DESCRIPTION
L Mix Indicator	Illuminates blue when the input has been routed to the left bus.
Input LED	Indicates input signal activity. Illuminates in various colors and intensities to show signal level and activity. • Green = signal presence (pre-fader) • Yellow = limiter activity (pre- and post-fade) • Red = signal overload/clipping (pre- and post-fade) • Flashing yellow = input PFL (solo)
R Mix Indicator	Illuminates blue when the input has been routed to the right bus.
PFL Switch	Activates PFL (slide left) and displays Input Settings screen (slide right) for respective inputs 7-12.
Bus Track Arm LEDs	Illuminates red to indicate the track is armed for recording.
LED Bus Track Meters	Displays metering levels for L, R, X1, and X2 tracks.
Record Button	The Transport Control on the mixer operates normally when the CL-6 is attached. This alternate, backlit Record button provides an additional control point for starting a recording.
Stop Button	This alternate, backlit Stop button provides an additional control point for stopping a recording.

Top and Bottom Panels

The top panel (shown) and bottom panel of the CL-6 provide multi-pin header connections for attaching a ribbon cable between the accessory and mixer.

Multi-pin Header (Uncovered)

Top Panel

Front Panel
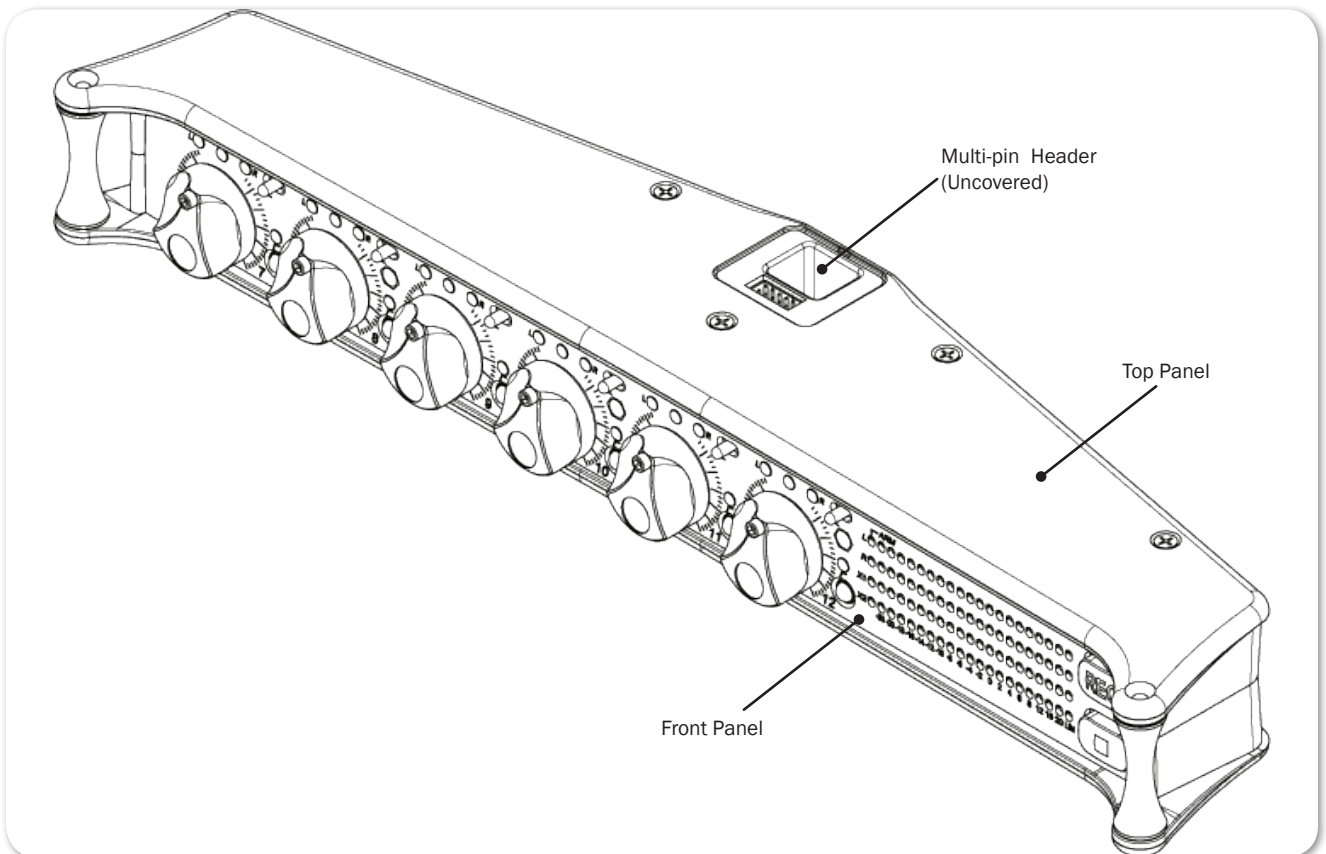
Trim Levels (688 only)

When the CL-6 is attached to the 688, the mini-faders on the 688 become dedicated trim controls for inputs 7-12.

To adjust the trim level for inputs 7-12:

▶ Turn the appropriate mini-fader on the 688. The trim gain is displayed on the mixer's LCD via the Input Settings screen.

Trim Levels (664 only)

When the CL-6 is attached to the 664, the mixer's SELECT encoder may be used to adjust trim for inputs 7-12 via the Input Settings screen.

To adjust the trim level for inputs 7-12:

1. Slide the input's PFL switch on the CL-6 to the right to access the Input Settings screen on the mixer's LCD.

2. Turn the SELECT encoder to adjust trim for the input. The trim gain is displayed on the mixer's LCD.

Using High-pass Filters

The High-pass Filter button on the CL-6 is a toggle, which turns the high-pass filter off or on to a predefined setting of 150 Hz.

ⓘ *On the 688, the high-pass filter may be adjusted to other frequencies via the Input settings; however, if the button on the CL-6 is used, high-pass filtering is turned on at a set frequency of 150 Hz.*

To turn on an input's high-pass filter:

▶ Press the High-pass Filter button associated with the input.

The High-pass Filter LED illuminates amber when high-pass filtering is on.

ⓘ *Press the button again to turn off the high-pass filter.*

Quick Routing of L and R Tracks

With the CL-6, you can quickly route an input to the left or right mix bus.

To route an input to L or R mix bus:

1. Hold down the input's High-pass Filter button.
2. Then, with that button held down, do either of the following:
   ▶ Slide the Input Select switch left to route the input to the L mix bus.
   ▶ Slide the Input Select switch right to route the input to R mix bus.

   The L and R Mix Indicator LEDs illuminate blue when the input is routed to the respective mix bus.

Specifications

The following specifications apply to the CL-6.

NAME	DESCRIPTION
Powering	• Powered by the mixer or, if attached, the SL-6 powering and wireless system.
Size (H x W x D)	• 1.75 in x 10.2 in x 2.25 in • 5.3 cm x 32 cm x 19.8 cm
Weight	• 21.5 oz • 2.21 kg (unpackaged, without batteries)

CS-688
Production Case for 688 or 664

Manufactured by Portabrace for Sound Devices, this production case with included shoulder strap was designed for use with the 688 or 664 Field Production Mixers, as well as attachable accessories, such as the SL-6 powering and wireless system and the CL-6 input expansion controller.

The case is reversible, so the mixer may be positioned anywhere inside for easy access and versatility.

Included:

- CS-688 Production Case
- Detachable Windowed Cover
- High-quality Shoulder Strap

Features

The production case is made from durable 1000 denier nylon and padded over rigid internal plastic framing for extra protection, shock resistance, durability, and temperature insulation. Other features include:

- Waterproof nylon exterior with layer of anti-skid material on bottom of case
- Adjustable dividers for main compartment and front pocket
- Pockets on each side for wireless transmitters and receivers
- Microphone power supply pocket
- Quick zipper access to cable ports on either side of case

Specifications

Name	Description
Dimensions (Interior)	• 12.8 in x 6.5 in x 8.0 in • 32.4 cm x 16.5 cm x 20.3 cm
Weight	• 4.6 lbs • 2.1 kg

Software License

End-user license agreement for Sound Devices 6-Series Software / Embedded Firmware

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