

## Headphone Output

The 722 headphone output is a flexible tool for monitoring audio in the field. The 722 allows the user to monitor inputs, tracks, and post-record tracks in a number of combinations. MS stereo monitoring is also available in headphones.


The headphone output is independent of the Master Output Bus and the Output Bus 2—audio sources can be routed to headphones independent of routing assignments to output buses.

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*The 722 is capable of driving headphones to extremely high sound pressure levels. Hearing experts advise against exposure to high sound pressure levels for extended periods.*

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### Selecting Headphone Sources

The headphone source display on the main LCD screen (  ) shows the audio sources sent to headphones. The 722 comes from the factory with several preset headphone audio source selections available on the Rotary Switch. These selections include inputs, tracks and track monitors. Turn the Rotary Switch to select among the available headphone monitoring sources.

#### Track Monitoring While Recording (Confidence Monitoring)

The 722 can monitor actual recorded audio written to the internal hard drive or CompactFlash during recording. This is commonly referred to as “confidence monitoring”. To monitor recorded tracks, during recording select one of the track monitor modes. Because of the record buffering topology of the 722, a delay of up to 12 seconds can be expected before recorded audio appears at the output. The 722 will play back recorded audio from the media highlighted on the LCD panel (see [File Management and Copying](#) for more information on selecting and highlighting storage medium).

### Setting Headphone Source Options

In addition to the 5 preset headphone routings, a total of 20 available “slots” can be filled in a user defined order. Headphone monitoring sources are selected from combinations of inputs, tracks, and post-record tracks, including stereo and MS decoding. The order of headphone selections is user-selectable. Available sources for headphone monitoring include:

HP Sources	Description
Inputs <b>1,2</b>	Stereo monitoring of input pairs. Input 1 is assigned to left headphone output; input 2 is assigned to right headphone output.
Tracks <b>A,B</b>	Stereo monitoring of track pairs. Track 1 is assigned to left headphone output; track 2 is assigned to right headphone output. Upon playback, will play as track monitor.
Monitor <b>A,B</b>	Stereo monitoring of playback (post-record) track pairs. Track 1 is assigned to left headphone output; track 2 is assigned to right headphone output.  <i>When using the recorded track monitor selection, there is a sample rate dependent delay in the signal. At 48 kHz sampling, the delay is approximately 12 seconds. This delay is due to the record buffering topology. Audio can not be monitored until it has left the record buffer and written to the recording media.</i>
Input <b>1, 1</b> Input <b>2, 2</b>	Solo monitoring of selected input. This signal is sent to both sides of the headphones.
Track <b>A, A</b> Track <b>B, B</b>	Solo monitoring of selected track. This signal is sent to both sides of the headphones. Upon playback, will play as track monitor.
Monitor <b>A, A</b> Monitor <b>B, B</b>	Solo monitoring of playback (post-record) track. Highlighted media is source of monitor program. This signal is sent to both sides of the headphones. When not in playback, headphones have no program.
Inputs <b>1, 2 (MS)</b>	Stereo monitoring of discrete M (mid) and S (side) input pairs. Highlighted media is source of monitor program.

HP Sources	Description
Tracks <b>A, B (MS)</b>	Stereo monitoring of discrete M (mid) and S (side) track pairs. Highlighted media is source of monitor program. Upon playback will function as MS track monitor.
Monitor <b>A,B (MS)</b>	Stereo monitoring of playback (post-record) discrete M (mid) and S (side) track pairs. Highlighted media is source of monitor program. When not in playback, headphones have no program.
Inputs <b>1+2, 1+2</b>	Summed inputs appear in each ear for summed mono monitoring of both inputs.
Tracks <b>A+B, A+B</b>	Summed tracks appear in each ear for summed mono monitoring of both tracks.

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*When tracks (A or B) are monitored in headphones, audio assigned to the tracks is heard in headphones during recording. During playback the recorded track audio is heard in headphones.*

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To set the available headphone source options for headphone monitoring enter the **HP: Monitor** modes menu. Once you enter the Monitor Modes menu you will immediately be in slot-1. Rotate the Rotary Switch to select the source you wish to appear first in your Headphone monitor list. Once the chosen source appears, press the Rotary Switch or the soft key **ENTER** (tone) key to move to the next slot. Continue down the list to select the source for each slot in the list. Once all sources have been chosen, press (done). This will exit the headphone monitor mode setup. You can exit the selection process by pressing the stop or cancel (backlight) key at any time.

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*If **DONE** is pressed in the first headphone slot, the 722 will select a single option (Tracks A, B) for headphone monitoring. The 10 factory presets will be erased.*

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## MS Stereo Monitoring

The MS stereo mode decodes discrete Mid-Side stereo signals to a left/right stereo signal for monitoring purposes. This allows for a proper stereo signal to be monitored in the field while discrete M and S signals are recorded for later post production. For the MS decoder to operate properly, the Mid signal is connected to input 1 and the Side signal is connected to input 2. The amount of stereo "spread" is fixed to a 50/50 percentage from Mid to Side signal.

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*If MS is selected for input linking, do not use MS stereo monitoring. This would result in two MS decoders being inserted in the signal path. The resulting audio in the headphones would be the discrete M and S signals!*

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## Rotary Switch Behavior

The action of the Rotary Switch during recording and playback is set from among the three available options:

- **Disabled:** pushing the Rotary Switch has no effect.
- **Selects Favorite Mode:** places the headphone source into the mode selected in the HP Favorite menu.
- **Playback/Monitor Drive Select:** pushing the Rotary Switch toggles between CompactFlash, internal hard drive, and external hard drives for playback and monitoring while recording.

## Headphone Favorite Selection

If “**Selects Favorite Mode**” is selected from the choices above, pushing the Rotary Switch selects the assigned “Headphone Favorite” source. This feature is helpful to quickly return to a selected headphone monitoring selection while recording or playing. One of the available headphone selection can be selected as the headphone favorite.

## Headphone Playback Mode

The user may select a headphone source for automatic selection upon playback. All headphone source selections are available for Headphone Playback Mode, as well as “No Change”, which leaves the headphone source set to the currently selected mode. Headphone Playback Mode is controlled in setup menu #61.

## Headphone Warning Tones

The 722 can generate an audible beep, or warning “bell”, in the headphones when an error has occurred. The specific error will be reported on the LCD. The output level of the warning bell is menu-selectable from off to -12 dBFS in the setup menu.

### Recording Start and Stop Bells

If the Setup Menu option **HP: Record/Stop Bell** is enabled, the 722 will generate beeps to alert the user of the recorder’s current status. These beeps are only sent to the headphone monitor, these beeps are not present in the recordings or at the analog outputs.

7-Series Status	HP: Bell
Recording	One 440 Hz beep
Paused (if using Rec: Record Pause)	One 220 Hz beep
Stopped	Two 220 Hz beeps

### Low Battery Warning

When either the attached battery or external power supply voltage reaches their low warning levels (6.5 V for the attached Li-ion, 11.0 V or user-selectable for external) warning tones are played in headphones. The warning tone is a three pop note of 880 Hz every 20 seconds.

If all warning tones are turned off, no tones are sent to headphones, including low battery warning tones.