

# SOUND DEVICES



## 744T

**High Resolution Digital Audio Recorder with Time Code**  
**User Guide and Technical Information**  
rev. 1.15



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### Welcome

Thank you for purchasing the 744T. The super-compact 744T records and plays back audio to and from its internal hard drive or Compact Flash medium, making field recording simple and fast. It writes and reads uncompressed PCM audio at 16 or 24 bits with sample rates between 32 kHz and 192 kHz. Compressed (MP3) audio playback and recording are also supported. The time code implementation makes the 744T ready for any recording job—from over-the-shoulder to cart-based production.

The 744T implements a no-compromise audio path that includes Sound Devices' next generation microphone preamplifiers. Designed specifically for high bandwidth, high bit rate digital recording, these preamps set a new standard for frequency response linearity, low distortion performance, and low noise.

With documentary and ENG mixing engineers in mind, the 744T is very small, while still being feature-rich. No other recorder on the market matches its size and feature set. In addition, its learning curve is quite short—powerful does not mean complicated. While the 744T is a very capable recorder by itself, it truly excels when used in conjunction with an outboard audio mixer such as Sound Devices' own 442 or 302.

Sound Devices took advantage of the best in professional and consumer electronics technologies to bring incredible feature depth with ease of use. Its two recording media (hard drive and Compact Flash) are highly reliable, industry standard, and easily obtainable. The removable, rechargeable battery is a standard Sony-compatible Li-ion camcorder cell. The 744T interconnects with Windows and Mac OS computers for convenient data transfer and backup.

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# Quick Start Guide

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The 744T is an extremely powerful and flexible portable audio recorder. Before recording, familiarity with the product is essential. Several settings should be verified or set based on individual recording needs.

## Powering the Unit

1. Apply power to the unit by connecting the (included) removable, rechargeable Li-ion (lithium ion) battery to the back panel battery mount. The metal tabs on the mount line up with the electrical contacts on the battery. From the factory, the battery may not have a charge, so external DC may be needed for initial operation and charging. Connect the included AC-to-DC power adapter to the DC input plug to power and charge the removable Li-ion battery.
2. Press and hold the power key (150 ms) to power up the unit. To power down the unit the power button must be held for one second.


If this is the first time the recorder has been powered, or if it has been without a battery for an extended period, the date and time may need to be set.









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*Charge the included Li-ion battery for 6 hours prior to initial use.*

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## Menu Navigation Basics

The setup menu provides options for recording, routing, and control parameters. The one layer menu structure allows for very quick navigation and selection of functions. To enter the setup menu press the front panel  key. Once in the setup menu, the following conventions are shared for navigating among selections and to select specific parameters.

-  - enters setup menu
-   - highlighted menu item
-  - selects highlighted item or parameter
-  - moves up in menu and between menu parameters
-  - moves down in menu and between menu parameters
-  - exits the selected menu or menu altogether
- The  stop key will exit from any menu and cancel any changes. Use it to escape out of the setup menus.

---

*The right panel Multi-Function Controller (labeled “Select”) is a convenient control to quickly navigate among menu items and item options. Its push-to-select function duplicates the check mark in most menus.*



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## Connecting Audio Sources

1. Connect audio sources, either analog or digital, to the appropriate input connector.
2. When using either input XLR 1, set the appropriate input level—mic, line, or digital—with the adjacent slide switch.
3. If mic-level inputs are used on XLR 1 or XLR 2, make certain that phantom power, input limiters, and high-pass filters are activated, as required.
4. When using inputs 3 or 4, set gain levels in the setup menu.

## Routing Inputs to Tracks

Before recording, inputs **must** be assigned to tracks. Each of the 744T's four inputs (1, 2, 3, 4) can be assigned to any of the four tracks (A, B, C, D). These sixteen possible routing combinations are shown on the front panel with 16 blue LEDs. Illuminated LEDs indicate input-to-track assignment.

1. Press the  input key to cycle through factory routing presets. The 744T has six often-used presets for quick setup of input-to-track routing combinations. Note the routing combinations on the blue LEDs with each successive press.
2. If none of the preset routing combinations are suitable, assign a custom routing. Sequential presses of the  input key will eventually cycle to the custom routing option (see *Input to Track Routing*, pg. 18).
3. Press **Exit** to leave input routing mode.

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*The custom input routing menu allows any input to be assigned to any track. Multiple inputs can be assigned to a single track.*

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## Recording Parameter Setup

For most productions, the general recording parameters of sample rate, bit depth, media selection, and file format are changed infrequently. Enter the setup menu to verify recording settings. Sample rate and bit depth are displayed on the LCD panel.


1. Select the bit depth as needed.
2. Set the sample rate as needed.
3. Select the file format for recorded files.
4. Select the storage medium (internal hard drive, Compact Flash, or both) for recording.

## Time Code Setup


When using a time code workflow, proper time code setup is essential. Skip this section if time code is not being used.

1. Select a time code frame rate appropriate for your project. For film, typical the time code rates are 30 fps non-drop (US) or 25 fps (EU). For standard definition video projects, use either 29.97 or 29.97 non-drop. For high-definition projects, use either 23.976 or 29.97.
2. Select the time code run mode: free run, continuous jam, record run, or 24 hr. run.
3. Use the 744T as the master clock source and jam time code to all other recording devices. This will assure that every device is using the same time reference. (See *Time Code* for additional information on time code setup).



## Recording




Now that file basics are set, you are ready to begin recording. The 744T is a record-priority box. Pressing the record key cancels all functions—except file operations—and immediately starts recording a new file. When record is pressed, the red record LED illuminates to confirm record mode. The filename in the LCD display shows the currently recorded file. Push the  stop (150 ms) key to end recording.

## Playback

When recording is stopped, the most recently recorded file is immediately available for playback. Press the  key to begin file playback from the beginning of the file.

**To select a file for playback:**

1. Press and hold the  key to select the folder (directory) for playback, either internal hard drive or Compact Flash. The default playback directory is the volume being recorded.
2. Use the Multi-Function Controller, or the arrow soft-keys, to navigate through the file directory.
3. Once a file is highlighted, press the  play key to begin playback.

When playback has finished, the filename will begin flashing. Use the  fast-forward key or  rewind key to step through files in the folder, or press the  stop key to exit playback mode.

## FireWire File Transfer

When connected via FireWire (IEEE-1394a) to a Mac OS or Windows OS computer (*see Specifications for computer requirements*), the internal hard drive and connected Compact Flash storage mediums are mounted onto the computer as “letter” accessible drives. Use the appropriate FireWire cable, either 6-pin to 4-pin or 6-pin to 6-pin, for interconnection. Files on the 744T can be treated as if they are local files, including renaming files, copying, and playing directly from the 744T storage medium.

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*In general, it is good practice to copy all needed audio files from the 744T to a computer before any processing is performed on the files.*

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### To connect the 744T for FireWire transfer:

1. Stop all playback and recording activity.
2. Make certain the 744T battery is fully charged, or connect to external DC.
3. Connect the 744T to the host computer with a FireWire cable.
4. The 744T will enter FireWire transfer, indicated by **COMPUTER CONNECTION** in the LCD display. All functions of the 744T are stopped while the 744T is connected to a computer through FireWire.
5. Navigate the drives on the computer and copy all needed audio files to the computer.

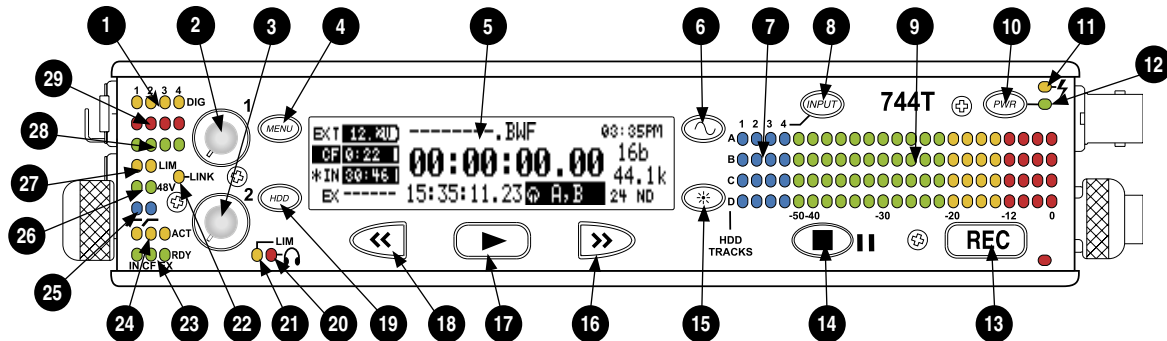
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*To avoid possible directory corruption on the 744T internal media, do not interrupt the connection process and always properly dismount the drives from the operating system. On Mac OS platforms, drag the drive icons to the trash. On Windows platforms, use the “Disconnect External Media” icon in the system tray.*

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## Front Panel Descriptions

All settings of the 744T can be accessed and monitored through the front panel LCD and navigation keys. This allows the unit to be placed in a production bag along with field mixers and wireless transmitters and receivers.



### 1) Digital Input LEDs

Indicates the presence of digital signal on the respective input. When flashing, indicates that digital input is selected but no valid digital clock signal is present.

### 2) Input 1 Gain

Controls the analog gain (input trim) of the channel 1 input. Normal mic input range is from 25 dB to 70 dB, low gain mic range is from 10 dB to 55 dB, line input range is from -6 dB to 18 dB. For line-level inputs, this control can be defeated and gain can be setup menu-controlled. If the LCD display shows "locked" when the pot is turned, gain control of the line-level input is menu-controlled. When inputs are linked as a stereo pair, Input 1 Gain controls the gain of both inputs.

### 3) Input 2 Gain

Controls input 2 gain, as in #2 above. When inputs are linked as a stereo pair, Input 2 Gain controls left-to-right balance.

### 4) MENU Key

Used to access all 744T setup menu selections. When in menu mode, used to move up through the menu selections. Pressing the HDD and MENU keys simultaneously brings up the time code jam menu.

### 5) LCD Display

Primary display of 744T status. The LCD is backlit using the LCD backlight control (#15).

### 6) Tone Oscillator

Tone frequency, tone level, and routing are controlled in the setup menu. Press and hold to activate the tone oscillator.

### 7) Input-to-Track Matrix LEDs

Blue LEDs indicate inputs (1, 2, 3, 4) enabled for recording to tracks (A, B, C, D). A solid blue LED indicates an input is routed to a track. A flashing LED during "custom" routing mode shows the selected input/track combination.

### 8) INPUT Select Key

Pressing this key cycles through the six factory preset input-to-track routing combinations plus the custom routing menu. In the custom routing menu any input can be routed to any track. See [Input-to-Track Routing, page 18](#).

### 9) Level Meter LEDs

Four, 19-segment track level-meters indicate level in dBFS. Metering ballistics are selected in the setup menu.

### 10) Power Key

Press and hold (150 ms) to power up the 744T. Press and hold (1 second) to power down.



- 11) **Charge LED**  
Indicates the status of the onboard battery charger. Flashes when external power is connected and battery is charging; solid when battery is fully charged.
- 12) **Power LED**  
Indicates the 744T is powered and available for operation. Flashes when the removable battery or external DC is in a low-voltage state.
- 13) **Record Key**  
Starts recording. The 744T is a record-priority box, pressing this key activates recording and discontinues all other functions, except file operations. Pressing key while recording can set a cue marker or start a new file, as selected in the setup menu.
- 14) **Stop/Pause Key**  
Press (150 ms) to stop recording.  
In playback mode, a single press pauses playback (play-pause), allowing audio scrubbing with the FF and REW keys. Another press of the key enters play-stop mode where the FF and REW keys select files for playback from the current directory. One more press of the key exits playback mode. In the setup menu the stop key is also used exit from any menu, returning to the main display.
- 15) **LCD Backlight**  
Toggles LCD and key backlighting. Hold down and turn the Multi-Function Controller to vary the brightness of LEDs. In menu mode, functions as the cancel key.
- 16) **Fast Forward Key**  
Performs fast-forward (FF) scrubbing through the played file when pressed in playback and play-pause mode. Play-pause indicated by flashing A-time on LCD. Fast forward rate increases the longer the key is held. In play-stop mode (indicated by flashing filename on LCD) selects the next file in the record folder (either daily folder or main folder).
- 17) **Play Key**  
Plays back the file displayed in the LCD. If pressed immediately after recording is stopped, the most recently recorded file is played back.
- 18) **Rewind Key**  
Performs reverse (REW) scrubbing through the played file when pressed in playback and play-pause mode. Play-pause indicated by flashing A-time on LCD. Reverse playback rate increases the longer the key is held. In play-stop mode (indicated by flashing filename on LCD) selects the previous file in the record folder (either daily folder or main folder).
- 19) **HDD Key**  
Press to enter the directory listing of the selected storage medium (either internal hard drive or CF). Selected medium is shown in white type. Press-and-hold to toggle between available mediums. If only one media is present, press-and-hold is disabled.  
Pressing simultaneously with MENU opens the time code jam menu.
- 20) **Headphone Output Peak LED**  
Indicates overload of the headphone amplifier. When lit, the headphone circuit is overloading. Reduce headphone level.
- 21) **LIM LED**  
Indicates that the microphone input limiters are engaged. This LED does **not** show input limiting activity (*see descriptor #27, Microphone Input Limiter LEDs*).
- 22) **Link LED**  
Indicates that channels 1 and 2 are linked as a stereo pair. In link mode the channel 1 potentiometer controls gain, channel 2 potentiometer controls left-to-right balance. Inputs can be linked as either a stereo L/R pair or as a Mid-Side (MS) pair.

23) **Media Ready LEDs**

Indicates storage media is present and available to record; IN (internal hard drive), CF (Compact Flash), EX (external Firewire device) [*EX not available in firmware version 1.x*]. Flashing indicates media problem.

24) **Media Activity LEDs**

Indicates storage media read/write activity. IN (internal hard drive), CF (Compact Flash), EX (external Firewire device) [*EX not available in firmware version 1.x*].

25) **High-Pass Filter LEDs** (mic-level only)

Indicates that the high-pass (low-cut) filter is active for the individual channel.

26) **Phantom Power LEDs**

Indicates phantom power (48 V) is active for the individual channel.

27) **Microphone Input Limiter LEDs**

Illuminates orange when limiting is occurring on the microphone input. If constantly lit, the microphone input is being “hit” with too high of a signal. Turn down the input sensitivity until limiting occurs infrequently.

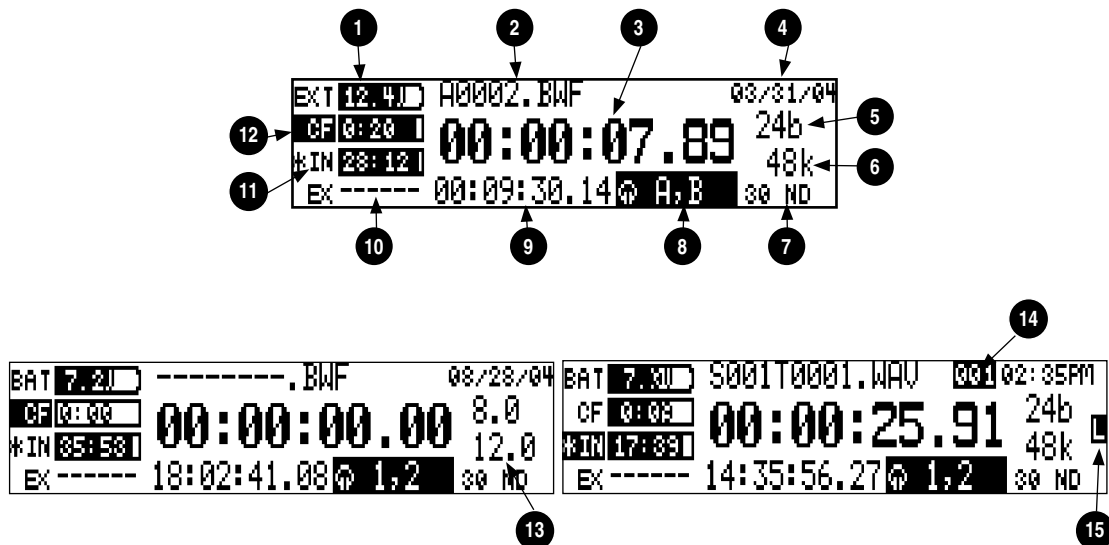
28) **Input Signal Presence LEDs**

Indicates presence of analog or digital signal and its relative level on each of the four inputs.

29) **Input Peak (Overload) LED**

Indicates analog signal is approaching clipping (−3 dBFS) on each of the four inputs.

## LCD Display Descriptions



- 1) **Battery Level Indicator**  
Shows voltage level of removable battery or external power sources. External power overrides internal power when present. Graphical bar for relative level and numeric indicator for precise voltage measurement.
- 2) **File Name Display**  
Shows file name actively being recorded or played back. In playback-stop mode, flashing file name indicates that the fast-forward and rewind keys can be used to step through files in the current playback directory.
- 3) **Absolute Time (A-time) Display**  
Shows the elapsed time of the file being recorded or played back. Flashes in playback pause mode. In this mode the FF/REW keys will scrub through an open audio file.
- 4) **Time & Date Display**  
Alternating display between the set date and time of the 744T. This information is written as the creation date for generated audio files.
- 5) **Bit Depth Indicator**  
Shows the set record bit depth. In playback, shows the file bit depth.
- 6) **Sample Rate Indicator**  
Shows the set record sample rate. In playback, shows the file sample rate.
- 7) **Time Code Rate**  
Shows the set time code frame rate. If a file has time code information embedded, the playback frame rate is indicated. If external time code is connected and the external rate differs from the rate set internally, the time code rate will flash.
- 8) **Headphone Source Display**  
Indicates the source for headphone output. Sources and selection order are user selectable in the setup menus.
- 9) **Time Code Display**  
In stop and record, shows the time code generated by the 744T. In play mode, the display shows the play file's time code information (if available). If non-time code files are playing, the display shows dashes.

10) **External Media Space Status  
(space remaining/record ready)**

*Not available on version 1.x firmware.* Bar graph indicates amount of record time remaining on the external FireWire volume. Numbers show time in hours and minutes based on the presently selected number of record tracks, sample frequency, bit rate, and file type.

11) **Internal Hard Drive Status  
(space remaining/record ready)**

Bar graph indicates amount of record time remaining on the internal hard drive. Numbers show time in hours and minutes based on the presently selected number of record tracks, sample frequency, bit rate, and file type.

12) **Compact Flash Status  
(space remaining/record ready)**

Bar graph indicates amount of record time remaining on the Compact Flash media. Numbers show time in hours and minutes based on the presently selected number of record tracks, sample frequency, bit rate, and file type.

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*For all three media types, an asterisk in front of the media descriptor indicates that the media is selected for record. Highlighted media descriptor indicates media selected for record monitoring, playback or file directory display.*

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15) **External Digital Clock Indicator**

The 744T is locked to a valid external digital or word clock source when the L is in the display.

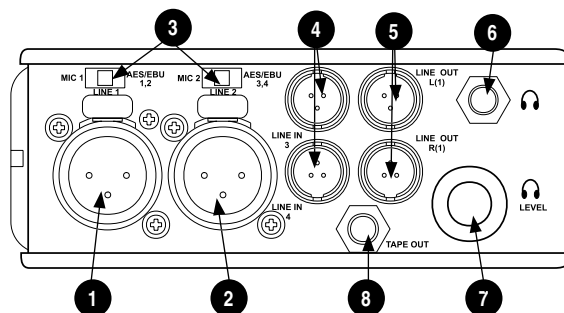
13) **Input 1/2 Level**

When control knobs are adjusted, indicates the gain level in dB for each analog input gain control. Normal mic input gain range is from 26 dB to 70 dB, low gain mic range is from 10 dB to 50 dB, line input range is from -6 dB to 18 dB. "Locked" will be displayed on the LCD when the pot is turned with digital inputs, and with line inputs with menu control.

14) **Cue Marker Display**

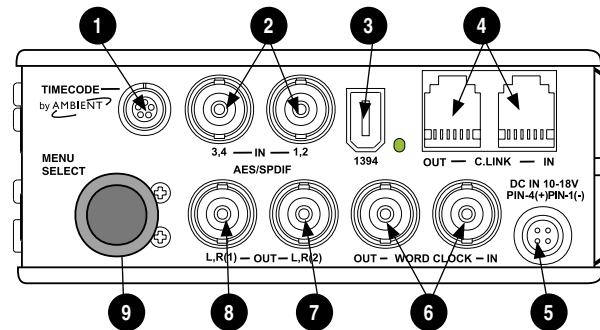
In record mode, indicates when cue markers are set. Markers set by pressing the record key (option must be selected in setup menu). In playback mode, displays cue points numerically as they are reached in a file.

## Left Panel Connectors and Controls



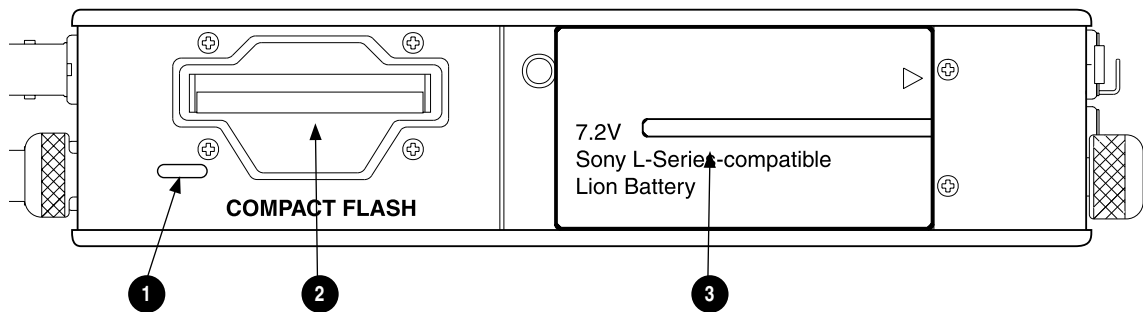
- 1) **XLR Input 1/AES3 Input 1&2**  
Dual function input connection. Input type set with switch above. Active-balanced analog microphone- or line-level input for input 1. Transformer-balanced two-channel AES3 input (1 and 2).
- 2) **XLR Input 2/AES3 Input 3&4**  
Dual function input connection. Input type set with switch above. Active-balanced analog microphone- or line-level input for input 2. Transformer-balanced two-channel AES3 input (3 and 4).
- 3) **Mic-Line-AES3 Input Switch**  
Selects the input level and mode of the associated XLR input connector.
- 4) **TA3 Channel 3&4 Line Inputs**  
Active-balanced line-level input connectors. Pin-1 ground, pin-2 (+), pin-3 (-).
- 5) **TA3 Master (L/R) Analog Outputs**  
Active-balanced, line-level analog L/R outputs for the Master Output Bus. Program source and attenuation level are user selectable. Pin-1 ground, pin-2 (+), pin-3 (-).
- 6) **Headphone Output**  
3.5 mm TRS stereo headphone connector. Can drive headphones from 8 to 1000 ohm impedances to required levels. Tip left, ring right, sleeve ground.
- 7) **Headphone Volume**  
Adjusts the headphone volume. NOTE: the 744T is capable of producing ear-damaging levels in headphones.
- 8) **Tape Output**  
Unbalanced tape (-10 dBv nominal) output on 3.5 mm TRS stereo connector. Signal source is identical to the Master Output Bus. Tip left, ring right, sleeve ground.

## Right Panel Connectors and Controls



- 1) **Time Code Multi-Pin**  
Time code input and output on 5-pin LEMO® connector.
- 2) **AES3id Inputs 1/2 and 3/4**  
Unbalanced digital inputs accept four channels of either AES3 or S/PDIF on BNC connectors.
- 3) **FireWire (IEEE-1394) Port**  
Connection to a computer to access the internal hard drive and Compact Flash volumes as mass storage devices. Direct connection to Mac OS (X-only) and Windows (XP- and 2000-only) computers.
- 4) **C. Link In/Out**  
RS-232 protocol interface on 6-pin modular ("RJ-12") connector for linking multiple 744T's together. Word clock, machine transport, and time code are carried on C. Link connector.
- 5) **External DC In**  
Accepts sources of 10–18 volts DC for unit powering and removable Li-ion battery charging. The Hirose 4-pin connector is wired pin-1 negative (-), pin-4 positive (+). Pin-2 (-) and pin-3 (+) are used to charge the removable Li-ion battery. DC ground at both pins-2 and 3 is at the same potential as chassis and signal ground.
- 6) **Word Clock Input and Out**  
Provides clock input and output for the 744T. Word input accepts sample rates between 32 kHz and 192 kHz. Word clock output is the rate that box is running. There is no sample rate conversion utility in the 744T.
- 7) **AES3id Output Bus 2**  
Unbalanced digital output, two-channel, for Output Bus 2. Signal source is menu-selected.
- 8) **AES3id Master Output Bus**  
Unbalanced digital output, two-channel, for the Master Output Bus. Signal source is menu-selected and is identical to the Analog Master Output Bus signal.
- 9) **Multi-Function Controller**  
When in the setup menu, the controller scrolls between menu selections; push enters selection or enters data. In record and playback modes, selects headphone monitor source; push action user selectable.

## Back Panel Descriptions



- 1) **Security Slot**  
Compatible with the Kensington® Security Slot specification. Useful for securing the recorder to a fixed object with a compatible computer lock.
- 2) **Compact Flash Slot**  
Insert Compact Flash medium with the label-side up. Compatible with Type I, Type II, and MicroDrives.
- 3) **Battery Mount**  
Accepts Sony® InfoLithium L- or M-Series batteries. Also accepts batteries conforming to this mount. Numerous capacities, from 1500 mAh to 6000 mAh can be accommodated.

## Input Setup and Control

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The 744T has four inputs and four record tracks. Inputs are selectable among analog or digital sources. Analog inputs 1 and 2 use XLR connectors; analog inputs 3 and 4 use TA3 connections. Digital inputs can be either AES3 (balanced XLR) or AES3id (BNC) inputs.

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*One analog pair and one digital pair can be used simultaneously.*

---

### Input Source Selection

Input sources are selected in pairs, 1, 2 and 3, 4. Each input pair (1, 2 and 3, 4) accepts analog or digital audio. The XLR input signal is selected with slide switch above the connector. Inputs 3 and 4 are selected from the setup menu.

Manually selecting the audio source is used to force the inputs to analog while using an AES3 or AES3id input to lock the 744T to an external sample rate.

Digital sources connected to AES3id BNC inputs override analog signals on the corresponding XLR input. The BNC input signal type is set in the menu settings **Input 1,2: Source** and **Input 3,4: Source**. For most situations the appropriate setting is auto select—the 744T will choose the input type based on signal present.

The 744T is capable of off-speed sample rates when clocked from either external digital inputs or the word clock input.

Input sources can be set to “disabled (power save)”. This option shuts down all circuitry associated with an input pair to reduce power draw and extend battery runtime. When an input pair is disabled, the digital input LEDs associated with the pair will slowly flash. In playback-only applications, both input pairs can be shut down to maximize power-efficiency and battery runtime.

### Analog Inputs 1 and 2

Analog inputs 1 and 2, on XLR connectors, are the primary connections into the recorder. These inputs accept balanced or unbalanced mic- or line-level inputs. Gain control for mic inputs 1 and 2 is adjusted solely by the front panel push knobs. Gain for the line level inputs can be controlled by the front panel potentiometers or menu settings. Line input gain is controlled in 0.1 dB steps.

---

*A digital input present on the BNC inputs will override an analog signal present on the XLR inputs unless the input source is set to analog in the setup menu.*

---

**In the setup menu, the following functions can be controlled for analog inputs 1 and 2:**

#### **Phantom Power (mic- and line-level inputs)**

Phantom power (48 volts) can be activated for inputs 1 and 2. When active, phantom is indicated by front panel LEDs (●●48V).

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*Phantom power is available for both mic and line level inputs. Using line-level inputs with microphones is useful in extreme SPL environments such as concert recording. Make certain to turn off phantom power with line level output devices susceptible to damage from DC.*




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**Shortcut:** To toggle phantom power without entering the menus, press and hold the tone key then press the menu key for channel 1. Channel 2 phantom can be toggled by pressing the tone key then



pressing the HDD key. If the inputs are in line level mode, phantom power will not activate from the shortcut keys and must be activated from the menus.

### Input Limiters (mic-level only)

Microphone inputs 1 and 2 each have a limiter circuit designed to prevent input overload. In normal operation, with proper gain settings, the limiters should rarely engage. When activated, these limiters will prevent unusually high input signal levels from clipping the analog input stage of the preamp. The front panel LIM LED () shows that the limiter is engaged. Limiter activity is indicated by additional front panel LEDs, one for each input channel (, ). The input limiters are active only with mic-level inputs. The limiters are engaged by (factory) default.

---

*When limiters are engaged, audio on channels 1 and 2 is limited to -6 dBFS.*

---

### Microphone-Level Control

Microphone gain is controlled by the front panel recessed knobs. The gain control adjusts an analog gain stage and is identical to the input trim on a mixing console or stand-alone microphone preamplifier.

### Line-Level Gain Control



When in line-level position, the gain for inputs 1 and 2 is controlled by the front panel recessed knobs or by a menu sensitivity setting. When set for front panel control, the user menu selection for input 1 and 2 line input sensitivity are lined out and not accessible.

### Input Linking (mic- and line-level)





Analog inputs 1 and 2 can be linked as a stereo pair. When linked, the channel 1 front panel potentiometer controls the signal level of both inputs, and the channel 2 pot controls the left-to-right balance of the pair. When the inputs are linked, their peak limiters are linked, as well.

When set as an MS pair, the inputs gain and balance for the pair work the same as stereo linking. There is no stereo width control as an MS pair since gain is adjusted.

### High-Pass Filters (microphone-level only)

The high pass filters on the microphone inputs use a combination of analog and digital filters to reduce sensitivity to low frequency signals. When the high-pass is engaged on an input, its front-panel LED illuminates to indicate it is active (, ). The first pole of the high-pass circuit is an analog filter at 40 Hz, 6 dB per octave and is part of the microphone preamplifier circuit. Additional poles of high-pass filtering are done in DSP.

Several frequency and slope combinations are selectable, including corner frequencies of 40, 80, 160, or 240 Hz, and filter slopes of 12 dB, 18 dB, or 24 dB per octave. The high-pass is selected for each input independently.

**Shortcut:** The filters can be toggled with a two-key combination. Press and hold the  LCD backlight key and press the  menu key for channel 1 high-pass. Press and hold the  LCD backlight key and press the  HDD key to toggle channel 2 high-pass.

### Gain Range (microphone-level only)

The microphone inputs operate in two gain ranges, normal and low. The normal range is from 25 dB to 70 dB of gain. The low range is from 10 dB to 55 dB. The low range is useful for high SPL recording environments.

## Analog Inputs 3 & 4

Appearing on Switchcraft TA3 connectors, inputs 3 and 4 accept balanced or unbalanced line-level signals. These inputs have few controls and are typically fed from the output of a mixer or preamplifier.

---

*Gain (sensitivity) for inputs 3 & 4 is controlled in the setup menu. Gain resolution is in 0.1 dB increments.*

---

### Analog Line Input Sensitivity

Input level sensitivity for the line-level inputs is adjustable, in 0.1 dB steps, from -6 dBu to +18 dBu. While adjusting the input sensitivity, the meters will show the relative signal level present on each input on the meters.

While channel 1 and 2 levels can be controlled by either the menu settings or the front panel pots, channels 3 and 4 are adjusted only in the setup menu.

## Signal Presence and Peak Indicator



The four signal presence and peak indicators show audio activity before input-to-track routing. Input signal presence LED's illuminate when a -50 dBFS or greater signal is present. Input signal peak LEDs illuminate when signal levels reach -3 dBFS or greater.

## Digital Inputs – AES3

The 744T accepts AES3 (AES/EBU) balanced digital at the XLR connectors. Digital inputs are in pairs—AES3 signals on XLR-1 appear at inputs 1 and 2, AES3 signals input to XLR-2 appear at inputs 3 and 4. To use the AES3 inputs, the input mode-select switch must be set to AES/EBU.




**DIG** The front panel digital input LEDs will illuminate when digital input is selected for the indicated track(s). If the LED is flashing, digital input is selected but a no valid digital clock is received.

## Digital Inputs – AES3id (S/PDIF)

The 744T accepts AES3id and S/PDIF unbalanced digital signals at the BNC connectors. The 744T will auto detect the type of digital signal and adjust accordingly. Input signals are in pairs, signals on BNC 1 appear at inputs 1 and 2, signals on BNC 2 appear at inputs 3 and 4.

AES3id inputs override analog signals present at the XLR inputs. To input analog audio while using the AES3id signal as a digital clock source, you must select analog in the input source menu selection for the appropriate inputs.

When a digital signal is present, the 744T will lock its sample rate to the source frequency. This is indicated by a highlighted block  on the main LCD display to the right of the bit depth and sample rate indicators. Recording bit depth is not affected by the external digital source.

If you are locking the 744T to an external digital signal, be certain the source is stable. Loss of the digital signal will cause the 744T to revert to its internally set sample rate, even while recording. The portion of the file recorded after the loss of signal may not play back properly. Once recording has begun, unused digital inputs are muted, digital signals that appear on them after the record key has been pressed will not be recorded or affect the sample rate of the 744T.

---

*The 744T will clock itself to the first digital signal presented to it. If the 744T detects a digital signal on the BNC inputs and locks to that signal, a digital signal applied to the XLR input will be ignored until the first digital signal is removed.*

---

## Input Delay

A digital delay is selectable on each channel of the 744T. Delay time per input in one microsecond ( $\mu$ S) steps. 1,000 microseconds equals 1 millisecond (ms). The Multi-Function Controller and menu

arrows are accelerated. The more you press or spin, the faster the delay setting will increment or decrement. Delay is not set until enter is pressed. The amount of delay available is dependent on the sampling frequency in use.

| Sample Frequency         | Maximum Amount of Delay Available (per input) |
|--------------------------|---|
| 32, 44.1, 48, 48.048 kHz | 30,000 $\mu$ S                                |
| 88.2, 96, 96.096 kHz     | 15,000 $\mu$ S                                |
| 176.4, 192 kHz           | 7,500 $\mu$ S                                 |

Input delay can be useful for time aligning input signals from differing sources. For example, digital wireless mics that have a processing delay in their outputs. In addition, all digital conversion stages have delay.

## Word Clock

Stable word clock is fundamental to a high quality audio signal. The 744T uses a rock-stable time code crystal to generate its internal word clock frequencies. The 744T can clock external devices from its word clock and accept external clock sources for recording.

The 744T can be used as a master word clock source or it can lock to external word clock during recording. The 744T disregards external clock, both AES and word clock, during playback.

### Clock Master

When sending digital audio to several devices, one unit is designated as the word clock master and the others should be slaves. Generally, the device with the analog-to-digital converter is designated as the word clock master.

The 744T can function as an A/D converter and can be used as the master word clock source. Slaved devices will derive their word clock timing from either their digital audio inputs, S/PDIF or AES/EBU, or through their word clock input connection. As a word clock master the 744T generates word clock whether or not audio is sent.

### Clock Slave

When using an external digital preamplifier connected to the 744T inputs, the recorder can derive its clock signal from the AES (S/PDIF) stream (it will slave to the external device), or the external device can be slaved from the 744T (if the external device has word clock input). If, for example, you are using a wireless receiver with a digital output, it may not have an external word clock input, and will be the word clock master.

If digital audio is connected to the 744T from more than one digital device, you must word clock the sources to the same clock, otherwise variations between the sources will render their signals unusable.

If the 744T is slaved to external word clock, be certain that the source is stable. Loss of the word clock signal during recording can cause the 744T to revert back to its internally set sampling frequency. If this occurs, the portion of the file recorded after the loss of word clock may not play back at the proper speed. For reliability, we recommend you set the 744T to the same sample frequency as the word clock source. Loss of the word clock signal in this case will most likely cause a glitch in the file, but the file will still be usable.

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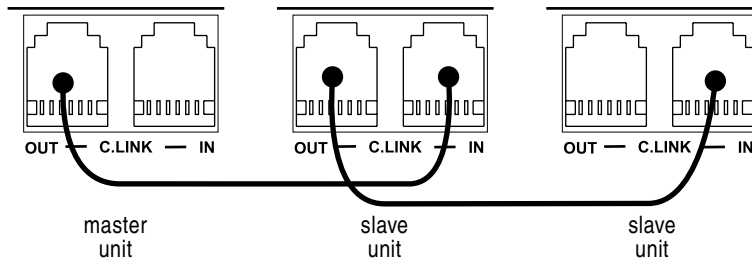
*To avoid digital loops, when using the word clock and digital input signals, you must make the 744T the word clock follower of the digital source.*

---

## C. Link – Multi-Unit Linking

The proprietary C. Link protocol (control link) allows multiple 744T's and 722 recorders to be connected and word clocked together. When linked, the 744T units have a master/slave relationship. When the master recorder is put into record, the slave unit will roll as well. Multiple units can be daisy-chained together to record many tracks. The C. Link protocol links carries the following data:

- word clock
- time code information
- RS-232 machine transport data



To link units:

1. Connect multiple units as shown in the illustration above.
2. Set all linked recorders to the same sample rate, bit depth, file format, and time code frame rate (if used). This will ensure that all files generated are compatible.
3. If time code is being used, set slave units to continuous jam mode so that they will follow the master recorder's time code generator.
4. Set scene and take numbers on all linked recorders to the same starting file name. There is no file name synchronization with multiple unit linking.

When linked, record start and stop on slave units will not affect units "above" it in the linked chain. This makes it possible for units to get out of synchronization if a unit other than the master is set to record or stop. Using the master unit will assure that all machines begin and end recording together.



*The C. Link jack is a proprietary RS-232 port. Under no circumstances should analog or digital telephone lines be connected to either jack. Serious damage could result.*

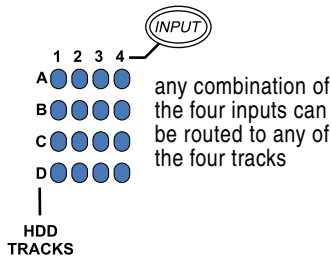
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## Input-to-Track Routing

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The 744T uses a simple, yet powerful routing scheme. The microprocessor-controlled matrix allows any input to be routed to any track. Multiple inputs can be routed to a single track to create mono-mixed recordings.

The 4 by 4 blue LED matrix makes it easy to check your current routing at a glance. A solid blue LED indicates an input is assigned to a record track.



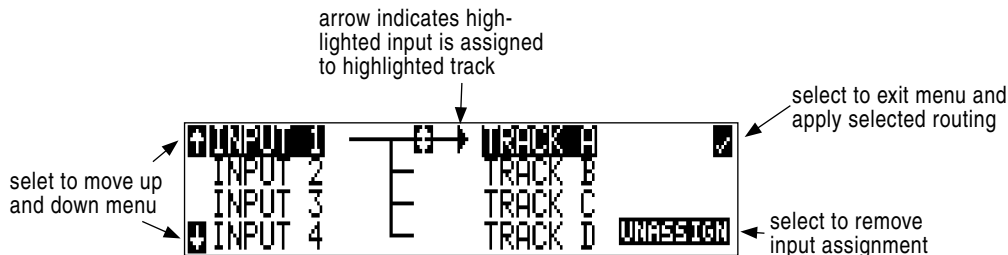
Regardless of which tracks are assigned for recording, monophonic file numbering always starts with 1, i.e., if only track D is selected for recording in a monophonic .WAV file, the resulting filename will have a \_1 suffix, not \_4. Polyphonic files will play back the recorded track starting from track A, i.e., if a poly file is recorded on tracks B and D, playback will occur on tracks A and B.

Use the **Input:Routing** selection in the menu to enter input select mode. Alternatively, press the **INPUT** input key to cycle through the six preset input routing combinations.

The last selection in the list is **CustomRoute**. Press the **EDIT** soft key to enter custom routing mode. Custom routing allows any input to be assigned to any record track. When assigning customer routing, active input and track combination are displayed in white text. The four inputs are shown on the left; the four record tracks are shown on the right.

To assign custom input routing:

1. Press the **INPUT** input key until **InputRouting** is displayed in the LCD display.



2. Press the **EDIT** soft button (⌘) and scroll to the appropriate input screen.
3. Using either the Multi-Function Controller or the up and down arrows, navigate to desired input-to-track combinations.
4. When a chosen pairing is highlighted press either the **ASSIGN** soft key or the Multi-Function Controller to assign the combination. Assigned tracks are noted on the screen by the addition of an arrow pointing to the record track. The LED routing matrix will also show a flashing blue LED for the currently selected input-to-track combination.
5. Once a track is assigned move to the next input-to-track combination desired.
6. To remove an input-to-track combination assignment, navigate that combination and press the **UNASSIGN** soft key.
7. Exit and complete the assignment by pressing the check mark soft key.

The input routing menu will always exit to the main screen whether entered from the input key or the menu selection.

## Outputs – Analog and Digital

The 744T has two discrete output buses, the Master Output Bus and Output Bus 2. Each of these two-channel buses are assigned their audio sources independently, enabling the 744T to feed multiple sources with unique two-channel program.

The chart below shows the audio sources available for the Master Output Bus and for Output Bus 2. The audio sources for each output bus are selected in the setup menu.

| Master Output Bus and Output Bus 2 Sources | Description   |
|--|---|
| Inputs <b>1,2</b><br>Inputs <b>3,4</b>     | Stereo input pairs. Input 1 (and 3) is assigned to left output; input 2 (and 4) is assigned to right output.<br><i>When inputs are selected as the source for the outputs, the state of recording or playback activity has no effect on the output signal. This allow uninterrupted audio at the outputs.</i>   |
| Tracks <b>A,B</b><br>Tracks <b>C,D</b>     | Stereo track pairs. Track 1 (and 3) are assigned to the left output; track 2 (and 4) is assigned to right output. On playback, will play as track monitor.  |
| Monitor <b>A,B</b><br>Monitor <b>C,D</b>   | Stereo monitoring of playback (post-record) track pairs. Highlighted media is source of monitor program. Track 1 (and 3) is assigned to left output; track 2 (and 4) is assigned to right output. When not playing or recording there is no output. There is significant delay in the monitor signal while recording due to the record buffer topology. |

### Master Output Bus

Audio signals routed to the Master Output Bus are sent to three output connections:

- analog line out, 2 x TA3, two-channel
- analog tape out, 3.5 mm TRS, two-channel
- digital 1, AES3id, BNC connection, two-channel

#### Analog Line Out L, R

The analog line outputs are active-balanced line-level signals on Switchcraft TA3M locking connectors. The output level is a nominally 0 dBu at –20 dBFS. The level of the line output can be attenuated in the setup menu by up to 40 dB in 1 dB increments.

#### Analog Tape Output

The tape output connection is stereo, unbalanced consumer output level (–10 dBV) on a TRS 3.5 mm connector. Output attenuation does not affect this output level.

#### Digital AES3id Output

The unbalanced AES3id output is directly compatible with most S/PDIF inputs. Attenuation to the Master Output Bus affects both analog and digital signals.

### Output Bus 2

Just as with the Master Output Bus, Output Bus 2 can be assigned signal sources from inputs or tracks. Sources assigned to Output Bus 2 are exclusive and do not affect the assignments to the Master Output Bus or headphone assignments. The same signal sources available for the Master Output Bus are available for Output Bus 2 (see chart above).

#### Digital AES3id Output 2


Output Bus 2 appears solely on the AES3id BNC output connector. There is no analog output connections for Output Bus 2. The unbalanced AES3id output is directly compatible with most S/PDIF inputs. The maximum output level is 0 dBFS and can be attenuated in the setup menu in 1 dB increments by 40 dB.

# Headphone Output

The 744T headphone output is a flexible tool for monitoring audio in the field. The 744T allows the user to monitor inputs, tracks, or post-record tracks. The headphone output is independent of the Master Output Bus and Output Bus 2—audio sources can be routed to headphones independent of routing assignments to output buses.

*The 744T is capable of driving headphones to extremely high sound pressure levels. Hearing experts advise against exposure to high sound pressure levels for extended periods.*

## Choosing Headphone Sources

The headphone source display on the main LCD screen ( **A,B**) shows the audio sources sent to headphones. The 744T comes from the factory with 10 preset headphone audio source selections available on the Multi Function Controller. These selections include inputs, tracks and track monitors. Turn the Multi-Function Controller on the right panel when at the main LCD screen to select among the available headphone monitoring sources.

### Track Monitor

The 744T can monitor recorded audio from the internal hard drive or Compact Flash while recording. To monitor recorded tracks, select one of the track modes with an “m” following the track designations. Because of the record buffering of the 744T, a delay of up to 12 seconds can be expected before recorded audio appears at the output. The 744T will play back recorded audio from the media highlighted in the LCD panel (see [File Management and Copying](#) for more information on selecting and highlighting recording medium).

## Setting Headphone Source Options

In addition to the 10 preset headphone routings, a total of 20 available “slots” can be filled in a user defined order. Headphone monitoring sources can be set from various combinations of inputs, tracks, and post-record tracks, including stereo and MS decoding. The order of headphone selections is user selectable. Available audio sources for headphone monitoring include:

| HP Sources   | Description   |
|--|---|
| Inputs <b>1,2</b><br>Inputs <b>3,4</b>   | Stereo monitoring of input pairs. Inputs 1 and 3 are assigned to left headphone output; inputs 2 and 4 are assigned to right headphone output.  |
| Tracks <b>A,B</b><br>Tracks <b>C,D</b>   | Stereo monitoring of track pairs. Tracks 1 and 3 are assigned to left headphone output; tracks 2 and 4 are assigned to right headphone output. Upon playback, will play as track monitor.               |
| Monitor <b>A,B</b><br>Monitor <b>C,D</b>   | Stereo monitoring of playback (post-record) track pairs. Tracks 1 and 3 are assigned to left headphone output; tracks 2 and 4 are assigned to right headphone output.                                   |
| Input <b>1</b><br>Input <b>2</b><br>Input <b>3</b><br>Input <b>4</b>             | Solo monitoring of selected input. This signal is sent to both sides of the headphones.   |
| Track <b>A</b><br>Track <b>B</b><br>Track <b>C</b><br>Track <b>D</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>Am</b><br>Monitor <b>Bm</b><br>Monitor <b>Cm</b><br>Monitor <b>Dm</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><br>Inputs <b>3,4 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><br>Tracks <b>C,D 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 MSm</b><br>Monitor <b>C,D MSm</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. |

*When tracks (A, B, C, or D) are assigned to headphones, audio assigned to the tracks appear in headphones during recording whereas the recorded track audio appear in headphones during playback.*

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 Multi-Function Controller to select the source you wish to appear first in your Headphone monitor list. Once the chosen source appears, press the Multi-Function Controller 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.

*If you press (done) in the first headphone slot, the 744T will select a single option (Tracks A, B) for headphone monitoring. The 10 factory presets will be erased.*

## Multi-Function Controller (Encoder) Behavior

The action of the Multi-Function Controller during recording and playback is set from among the four available options:

- **Disabled:** pushing the controller has no effect.
- **Selects Favorite Mode:** places the headphone source into the mode selected in the HP Favorite menu.
- **Headphones to C/D meters:** shows the level of the headphone output on the C/D track meters.
- **Playback/Monitor Drive Select:** pushing the controller toggles between the available media to select the drive available for playback and track monitor while recording.

## Headphone Favorite Selection

If “Selects Favorite Mode” (above) is selected, a press of the Multi-Function Controller selects the assigned “Headphone Favorite” audio source. This feature is helpful to quickly return to a selected headphone monitoring source while recording or playing. All possible headphone sources are available to choose as the Headphone Favorite. The Headphone Favorite is selected in setup menu #60.

## Headphone Playback Mode

The user may select a headphone source that will automatically be selected by the 744T 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.

## Warning Tones

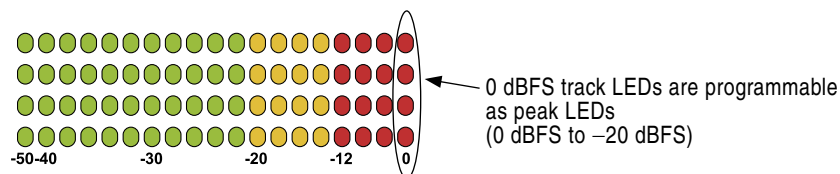
The 744T can generate an audible beep, or warning “bell”, in the headphones when an error has occurred. The specific error will be reported on the LCD. The output level of the warning bell is menu-selectable from off to 0 dBFS in setup menu #62.



# Metering

The 744T features a 76 LED (4 x 19) output meter. The DSP-controlled output meter provides a selection of ballistics and lighting intensities. In addition, peak indicators on input channels show clipping activity.

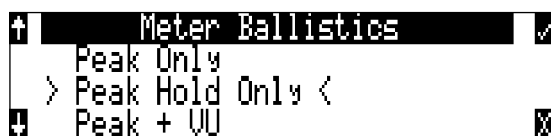
## Output Meter



The meter uses energy efficient LEDs which are viewable in full sunlight. The 744T output meter is unaffected by shock or extremes in temperature and humidity. Meter ballistics are setup menu selectable among VU, Peak, Peak-Hold, VU + Peak and VU + PeakHold.

The meter uses a non-linear metering scale which increases meter resolution in the most important part of the scale. From -50 to -40 dBFS, each LED segment equals approximately 10 dB. From -40 to -12 dBFS, each segment equals 2 dB. From -12 to 0 dBFS each segment equals 4 dB.

## Meter Ballistics



The output meter can be set to display any of five types of meter ballistics: VU, Peak, Peak-hold, a combination of VU and Peak, and a combination of VU with Peak-hold. The meter ballistics are selected in the setup menu.

### VU - (Volume Units)

Ballistics correspond closely to how the human ear perceives loudness and 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. While giving a very good visual indication of perceived loudness, VU meters gives poor information on actual signal peaks and are virtually useless for tracking to the 744T. In VU mode, the front panel meter labeling is in volume units.

### Peak

Peak-reading ballistics correspond to actual signal maximums, but don't necessarily correspond to perceived signal loudness. A peak meter has a near-instantaneous attack to display maximum signal amplitude and a slow decay to allow the user to see them. Peak metering is essential for digital recording, since signal overload can cause immediate distortion. The peak meters front panel markings are calibrated in dBFS, decibels relative to full scale digital signal.

### Peak Hold

Essentially the same as Peak metering where the peak level indication will hold for the peak level indication for several seconds. Peak-hold indicators are useful for metering in applications when an overload condition is unacceptable.

### Peak/VU

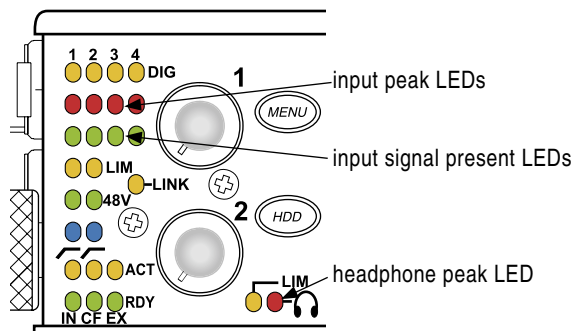
The meter can simultaneously display VU and Peak level information. In this mode the perceived loudness (VU) is displayed on a bar graph, and the Peak signal on a dot above the VU. With this

combination the user gets the best of both VU and Peak metering by seeing both the “loudness” of the signal and the peaks at the same time. Peak/VU is the factory default.

### Peak Hold/VU

Similar to VU/Peak mode, this mode holds the peak level indication for several seconds before releasing. Peak Hold indicators are useful for metering in applications when an overload condition is unacceptable.

## Peak LEDs



In addition to the main LED output meter, peak LEDs show input peaks, track peaks, and headphone peaks.

### Input Peak

The 744T has a peak LED associated with each input. These LEDs illuminate when input signal reaches  $-3$  dBFS. There is no user-adjustment to the Input Peak LEDs.

### Track Peak


The 0 dBFS LED on each track can also function as a track peak indicator. The user can select a signal threshold above which the 0 dB LED will flash.

### Headphone Peak

Like the channel peak LEDs, the headphone circuit has an indicator for peak overload. This LED is useful, since headphones can often overload before the recorder overloads. Monitoring without a visual indication of headphone clipping may mislead the operator into thinking that the output or return tracks are distorting.

## Tone Oscillator


The tone oscillator level and frequency are user selectable. Reference level is adjustable over a range of  $-40$  to  $0$  dBFS. Reference tone frequency is adjustable from 100 to 10,000 Hz. Standard tone levels vary according to the practices and needs of production and post-production, but are generally in the  $-20$  to  $-12$  dBFS range.


The tone oscillator is activated by pressing the front panel  key. Tone will active only while the tone key is pressed. Tone is routed where specified in the setup menu. Routing choices include: outputs, outputs and tracks, tracks only, or no tone routing (disabled). When routed to tracks, all selected record tracks will receive the tone signal.

## LCD Contrast & Backlight, LED Brightness

### LCD

LCD contrast is setup menu controlled. From the factory the contrast is set to 20%, suitable for most viewing conditions. Contrast can be increased or decreased.

The front panel  key toggles the LCD and key backlight. Backlighting is suitable for low- and no-light recording.

LED brightness is continuously adjustable from low to high brightness. Hold down the  key and turn the Multi-Function Controller to change brightness levels. All LED's are adjusted. In stealth mode (setup menu selected) the LEDs are toggled on and off with the brightness key.

## Sample Rate and Bit Depth

When recording to BWF (and WAV files) the 744T generates uncompressed, PCM audio files at user-selected sample rates and bit depths. The 744T LCD indicates available recording time based on the sample rate, bit depth, and number of tracks set for recording. See the [Calculating Recording Time](#) later in this guide to estimate record time.

### Sample Rates



When a sample rate is selected for recording, all tracks are recorded at the selected sample rate. Sample rates are selected among common rates from 32 kHz to 192 kHz. Additionally, non-standard sample rates can be applied when the 744T is word clocked from an external source.

#### Sampling Frequency = Available Audio Bandwidth

The sampling frequency is expressed in samples per second (in hertz) and defines the number of times in a second that the analog audio signal has been measured. Sampling frequency determines the audio bandwidth, or frequency response, that can be represented by the digital signal. A quick estimate of the maximum bandwidth capable of being represented at a given sample rate is maximum analog frequency = sampling frequency / 2. Higher sampling frequencies allow for wider audio bandwidth.

### Bit Depths

The 744T records at bit depths of either 16 or 24 bit. 24 bit recording provides greater dynamic range and addition headroom for signal peaks relative to 16 bit recordings. 24 bit acquisition is a significant benefit for field production audio tracks.

#### Bit Depth = Available Dynamic Range

Bit depth defines the digital “word length” used to represent a given sample. Bit depth correlates to the maximum dynamic range that can be represented by the digital signal. Larger bit depths theoretically yield more dynamic range. A quick estimate of maximum dynamic range capable of being represented by a given word length is dynamic range  $\approx$  no. of bits  $\times$  6 dB. Bit depth is an exponential measure (exponent of 2), so as bit depth increases, the amount of data it represents increases exponentially. The majority of field recording is done with 16-bit audio, therefore, each sample is represented by a digital word of  $2^{16}$  (65,536) possible values. 24-bit audio has a word length of  $2^{24}$  (16.7 million) possible values per sample.

The 744T has 24 bit analog-to-digital converters. To obtain 16 bit recording the 744T can be set to dither 24 bit digital signals to 16 bit. The 744T uses a proprietary pseudo-random dither routine for accurate bit rate reduction. Dither can be defeated in the user menu. Without dither 24 bit audio is truncated to 16 bit, meaning the least significant 8 bits are discarded.

*Once a file is recorded its sample rate and bit depth can not be changed in the recorder. The 744T can not perform sample rate conversion or bit depth changes. File conversion must be done in another environment, such as an audio workstation. Alternatively, a real-time analog transfer is often performed instead of sample rate conversion.*

## Time Code

The 744T uses time code circuitry developed by Ambient Recording GmbH, a leading developer of stable, portable time code products (visit Ambient on the web at [www.ambientaudio.com](http://www.ambientaudio.com)). Clock stability and continuity are critical aspects of the 744T time code implementation. Its temperature-controlled (compensated) crystal oscillator ensures rock solid TC stability and accuracy (< 0.2 ppm when tuned with an Ambient Master Controller).

The 744T holds accurate time code for up 8 hours between battery changes using its internal, rechargeable AA NiMH time code cell. This time code battery is charged from internal or external power whenever the 744T is powered up.

Non-linear file-based recordings place a single time code number in the data header of an AES31 (.BWF) file. The 744T generates SMPTE time code from this number and extrapolates it based on the time code frame rate for playback.

### Frame Rate

Time code frame rate is selected in the Timecode:Framerate menu.



The 744T supports the most common production time code rates:

- **23.976** – used with Sony high definition video cameras
- **24** – to sync audio to film where no transfer to NTSC video is expected
- **25** – to sync sound to PAL video
- **29.97** – to sync sound to NTSC video shot in non-drop frame mode and Panasonic high definition cameras
- **29.97DF** - to sync sound to NTSC video shot in drop frame mode
- **30** – to sync sound to film where transfer to NTSC video is expected
- **30DF** – to sync sound to film for transfer to NTSC video in drop-frame mode 30 fps

### Time Code Modes

The 744T has five time code modes: off, Free Run, Record Run, Continuous Jam, and 24 Hour Run.

#### Off:

The time code generator is disabled. The front panel time code display is blank.

#### Free Run:

The internal time code generator runs continuously without regard to the record mode. Time code value defaults to 00:00:00:00, a user entered value, or the value last in the internal generator. The user can jam any start value into the generator from the jam menu.

#### Record Run

The time code generator runs only when the 744T is recording. Time code in this mode defaults to

00:00:00:00 at power-up. When switching to record run from another mode, the internal generator will stop at the last number generated. A user-defined value can be jammed into the internal generator from the jam menu.

### Continuous Jam:

The onboard time code generator will re-jam from external time code whenever time code is connected to the TC input. Similar to free run mode, the generator runs continuously without regard to record mode. For a jam to occur, the time code signal must be disconnected and re-connected to the time code input. Continuous jam is useful when slaving additional recorders to a master recorder. Slaves should be set to continuous jam to follow the master time code device.

### 24 Hour Run

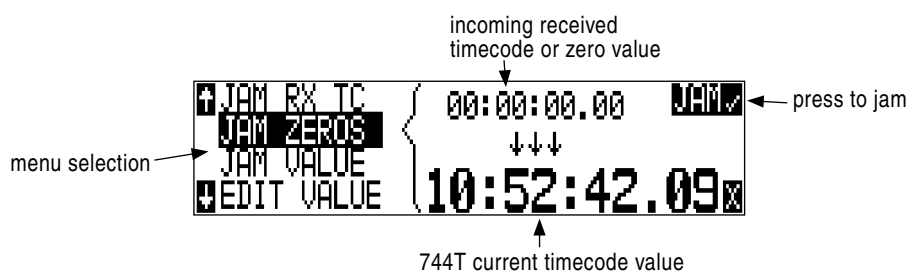
Identical to free run with the exception that the generator will automatically jam itself from the time-of-day clock on power-up. The generator will also re-jam if the time-of-day clock is reset. Once jammed, the generator will run continuously from the time code clock, not the time-of-day clock.

---

*If the time-of-day clock is reset during the production day or if the time code mode is changed from 24 hour run to another mode and back, the time code generator value will change. You must re-jam all time code devices to ensure proper synchronization.*

---

## Jam Menu



Time code setup is done from the jam menu, Timecode JamMenu. Pressing the drive key and menu keys simultaneously quickly enters the jam menu. In this menu, the top of the display shows the value of signal present on the time code input and the bottom of the display shows the currently set time code value. In addition, the 744T displays the frame rate of the incoming time code and the current frame rate setting of the 744T.

The 744T time code generator can be set in three ways.

### Jam RX TC

To jam the internal generator to the external value, press the enter key or the Multi-Function Controller button. The screen will say “JAMMING”. Once the 744T is jammed to the external time code, the external and internal numbers will match and run in sync.

---

*Identical to the Ambient Recording series of time code products, the 744T time code generator is capable of “cross jamming” differing frame rates. The 744T will cross jam time code at the top of the second giving phase-accurate (the 00 frames will match) time code at the frame rate set in the 744T instead of the incoming frame rate.*

---

### Jam Zeros

This menu selection resets the internal generator to zero.

### Jam Value

Press enter (tone key) or the controller button to jam the user-entered time code start value into the internal generator.

### Edit Value

This menu allows the user to set any valid time code value (00:00:00:00–23:59:59:29) for entry with the jam value selection above. The initial screen of this menu shows the currently set value as well as the current time code setting of the 744T. Press the controller or the enter key (tone key) to enter into edit mode. The user can set the time code numbers in pairs (hours, minutes, seconds and frames). Once (DONE) is selected the value is available to jam into the internal generator with the jam value selection.

---

*The value is not jammed into the 744T time code generator until jam value is selected.*

---

## User Bits

The 744T has six user selectable user bit modes. Time code user bits are a portion of the time code data which can be allocated however the user chooses. Commonly, user bits carry information such as the date, take, sound roll, or camera roll number.

User bits are edited from the **Edit U-Bit** selection in the jam menu. Press enter (tone key) or the controller to enter user bit edit mode. The screen will show the format and setting of the user bits. Using the controller or the soft-button up and down arrows, user bit digits can be edited (in pairs). Once **DONE** is selected, the user bits are set. If editing is not available in the selected user bit mode “No User Edits” will appear in the screen.

## NTSC Standard Def Video Production

NTSC video uses a frame rate of 29.97 frames per second. Unfortunately, that leaves 108 frames per hour unaccounted. To keep 29.97 time code in sync with “clock” time, the concept of “drop frame” was devised. Two frames are dropped at the top of each minute not divisible by 10. 54 drops per hour x 2 frames = 108 frames per hour.

To sync the 744T to a video camera, first determine if the camera is in drop frame or non-drop frame mode. If you, the DP or the producer are unsure about what setting to use, check with post-production, if possible.

---

*As a rough guideline, video for NTSC broadcast is drop-frame, you can use non-drop frame for anything else, as long as all recorders are recording in the same mode.*

---

1. Set the 744T to either 29.97DF or 29.97 respectively.
2. Jam the camera using a LEMO-5 to BNC adapter cable connected to the time code input on the video camera.
3. Switch the camera to free run time code. The 744T time code should appear in the time code display on the camera.
4. Disconnect the time code cable.

The camera and recorder time code should now be running in sync. Check it after roughly 5 minutes to be certain synchronization is maintained.

---

*Video cameras are notorious for time code instability when switched off. If the video camera must be shut down, re-jam it when it is powered back up.*

---

## Audio File Formats

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The 744T records audio to industry-standard file formats—Windows Wave (WAV), Broadcast Wave (BWF, monaural and polyphonic) and MPEG Layer 3 (MP3).

### WAV / BWF

The 744T adheres to the AES-31 BWF file specification. The filename extension is user-selectable between .WAV or .BWF. **There is no difference between the two file types except for the extension.** Users wishing to record “standard” wave files should select the .WAV extension. Time code will be stamped at the head of the file, but software that does not recognize the broadcast wave data chunk will simply ignore this added information.

The BWF files created by the 744T contain production information in the Broadcast Audio Extension data chunk. Among the values recorded are:

- time code stamp
- time code frame rate
- date and time of the original recording
- bit depth
- sample rate
- originating machine serial number

All of the information contained in this chunk is available for post-production.

---

*If time code is turned off the unit will write files with a WAV extension only.*

---

### MP3 – MPEG Layer 3

For music and voice recording applications where compressed audio is acceptable, the 744T can record to industry standard MPEG Layer 3 (MP3) audio files. These data-compressed files are generated using a high-quality MP3 codec. Numerous data rates are available. When recording MP3 files, the time code generator will remain running internally, but will not record time code to the file. The only time reference available is the Absolute Time (A-Time) of the file.

The 744T can play back MP3 files, as well as record them. This is very useful on-set to play a personal MP3 audio library during downtime.

---

*By definition of the file format, MP3 recordings are limited to two tracks, therefore only tracks A and B are available for assignment. Time code is not a part of the MP3 format. Even with time code enabled and running during MP3 recording, time code will not be recorded with the file.*

---

## Recording and Playback

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Recording and playback of audio are unquestionably the most important functions of the 744T. The user interface of the product has been designed to leverage the existing paradigm of a “tape recorder” so that the unit is easily understood. Recording and playback functions are quite similar to that of tape-based machines, however the nature of a non-linear recording medium provides additional control not possible with tape-based recorders.



### Recording



● The largest, most easily accessed control on the 744T is its record key. Recording takes priority over all activity except for disk formatting, disk speed tests, and file transfers. The 744T will immediately enter record mode whenever the record key is pressed. When recording, the adjacent red LED will illuminate to indicate that the unit is in record mode.

---

*If no inputs are routed to tracks, recording cannot take place. Make certain that at least one record track is assigned for recording.*

---

While recording, the power, ff, rew, input, tone, and drive keys are disabled. Recording is stopped by pressing and holding the STOP key. The Stop key must be held for at least 150 ms to end recording. Although you can enter the setup menu during recording, menu items that will affect recording are lined out in the menu list.

---

*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.*

---

During recording, subsequent presses of the record key can perform one of three setup-menu-selected actions:

- no action,
- new cue - cue markers are set within the file being written,
- new file - a new file is started with each press of the record key, the take counter is increased by one.

---

*When removing the CF from the 744T, always observe the amber activity LED for the CF medium. If it is lit, wait until it goes out before removing the CF. If you remove the CF while the LED is lit, the file will be corrupted and there is a possibility of FAT corruption as well.*

---

### Playback

Just like a “tape recorder”, pressing play will begin file playback. The 744T has high-resolution playback circuitry and is appropriate for any reference audio application. Any file recorded by the 744T can be played back, including all uncompressed audio files and MP3 file playback. In addition, files copied to the storage mediums from a computer can be played back. This is useful when using the 744T as a high-resolution playback device.

The 744T plays back the last recorded audio file unless another file is selected. There are two ways to select another file for playback. To select another file in the current record directory, push either the FastForward or reverse key to put the 744T in to play-stop mode. The filename display will begin flashing and the FastForward and Reverse keys are used to step through files available in the current record directory. To select a file in an alternate directory, press the HDD key to enter the media directories. Navigate to the appropriate directory. Select the file that to play back with the Multi-Function Controller and press play.

If the stop key is pressed while playing files from an alternate directory, the 744T will revert to the current daily directory.



## AutoPlay

The 744T can be set to play back all valid audio files in a directory. Files will play back in their order in the directory. Autoplay can be set with the following options:

- **Disabled** – auto playback is off
- **Play all** – all files in the directory will play, then stop when all files have been played
- **Repeat one** – the selected file will play back, then continue until
- **Repeat all** – all files in the directory will play in succession, then repeat until stopped by the user

## Storage Medium – Internal Drive

---

The 744T's internal hard disk drive is the 744T's primary storage medium. The large capacity and fast data read/write speeds of hard drives are a perfect choice when long form, high data rate recording is performed. This is a good balance of speed, reliability, noise performance, and current draw. Higher speed drives may be used with the 744T, however they will not significantly improve performance. They will slightly increase transfer throughput with the penalty of increased current draw and reduced battery run time.

## Formatting

The drive installed in the 744T is formatted at the factory as a single-partition FAT32 volume. If a drive with multiple partitions is installed, the 744T will only “see” the primary partition. The 744T can only address one partition.

As a matter of routine maintenance, periodic re-formatting of the 744T hard drive is recommended. Formatting the hard drive rebuilds the FAT (file allocation table) and erases any audio or other data files present on the medium. This reduces possibility of directory corruption.

---

*Be certain that all files on the 744T drive have been backed up to another media before formatting. Once formatted, all data on the drive will be erased.*

---

### To format the 744T internal hard drive:

1. Ensure that all data on the hard drive has been copied or is no longer needed.
2. Press the Menu key.
3. Use the Multi-Function Controller to scroll to **InHDD: (Erase)**.
4. Press the controller button to begin formatting.
5. Press the controller once more to confirm the operation.

Formatting the 744T hard drive can take up to 30 seconds. When the format is completed, the 744T will create a fresh menu hierarchy, including the daily folder, if selected. Once you exit back to the main screen the 744T is ready for recording.

## Drive Repair

Included in the software for the 744T is a basic drive repair utility. The utility is similar to Windows “Scandisk” and will check for file system integrity, recover lost cluster-chains, fix or recover damaged file allocation tables (FAT), and repair corrupted WAV files. This utility should be run after improper media removal, or in the event of a write error during recording.

When selected from the setup menu, the repair utility will scan the drive for problems, report the number of errors and correct the errors.

### Drive Type

The 744T ships with a 2.5-inch ATA-5 interface, 5400 RPM hard drive. Sound Devices has chosen the specific mechanism for maximum vibration and shock resistance. Most 2.5 inch drives conforming to the ATA specification can be substituted for the factory hard drive. When choosing a substitute hard drive, note that higher RPM hard drives draw more current, reducing battery run time.

### Drive Failure

Hard disk drives are mechanical devices and are susceptible to damage from physical shock. One type of physical shock, called **operating shock**, occurs when the disk is in operation. During operation, the drive head is typically over the drive platters reading and writing data. When a physical shock to the drive occurs during operation, the head and the platters can come into contact causing both components to be damaged. The second type of shock, called **non-operating shock**, occurs when the head is in the unloaded position, or not positioned over the platters. When a physical shock occurs in the non-operating state, the head can contact the ramp it is positioned over and damage the ability of the head to read and write data to the hard disk drive. All devices with hard drives are subject to damage from operating and non-operating shock.

The mechanical construction of the 744T is designed to minimize the transmission of shock to the hard drive. The drive is isolated from the chassis using special shock-reducing closed-cell foam. This material increases the amount of shock the hard drive can withstand. Additional protection can be achieved by operating the unit in a carry case.

---

*If the recorder is used in applications subject to extreme motion, Sound Devices recommends recording to CF medium only. The hard drive will park its write heads to reduce the chance of failure.*

---

With all electrical devices, the higher the ambient temperature the shorter the device's operational life. Therefore, take care observe the specified temperature rating.

There is also a risk from sudden temperature changes, which can create condensation inside the drive. This condensation can lead to the drive's read/write heads adhering to the disk surfaces which will, in turn, stop the hard disk from rotating. Condensation tends to occur when the temperature inside the drive suddenly falls, for example, just after the unit is moved to a new position, or after operation is stopped in a cold environment.

Sudden changes in temperature or air pressure can cause disk surface material to evaporate, which can also cause the head to adhere to the disk surface. This can happen when a hard disk drive is left unused for a long period of time.

### Drive Replacement

The internal hard drive can be removed and replaced if the device fails or if a different capacity drive is needed. The internal hard drive is not a swappable medium. Its multi-pin connector is not rated for repeated insertion and removal cycles and may be prone to breakage with repeated cycling.

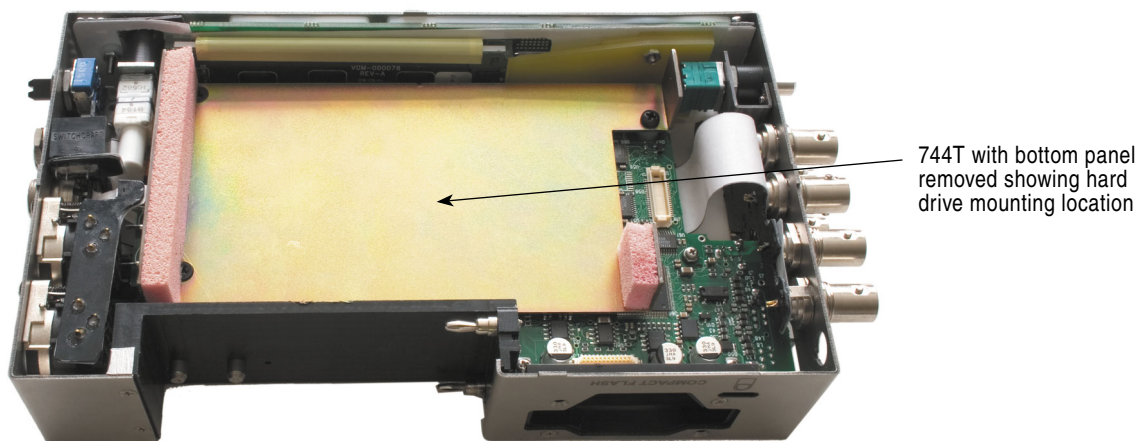
---

*In typical service conditions Sound Devices recommends hard drive replacement once every three years.*

---

The hard drive is mounted to the bottom-side of the recorder's chassis and is screwdriver accessible. The drive is "suspended" in the unit with a shock isolating membrane and is attached to the main circuit board via a "flex board". Since the unit's high-density circuitry and tight construction

require specific electronics knowledge, Sound Devices strongly recommends drive replacement be performed by a qualified technician using proper ESD precautions. Drive replacement done by a qualified technician has no warranty implications.



*The internal hard drive is not intended as a swappable exchange medium. Only qualified service technician using proper ESD precautions should perform drive replacement.*

## Storage Medium – Compact Flash

Compact Flash (CF) is a practical, portable storage medium for audio recording. Its speed, reliability, and price continue to evolve to the benefit of portable recorders. The 744T can write to and read from CF as either its sole recording medium or simultaneously with the internal hard drive.

### When to Use CF

The key benefits of CF include:

- wider temperature range capability than hard drives
- increased shock immunity versus hard drives
- convenient media insertion and removal
- established workflow and ubiquitous card readers and transfer tools

### Formatting

Upon insertion of an unformatted (or non-FAT32 formatted) CF medium, the 744T will prompt the user to format the card. If the card is formatted as a FAT32 volume the card will be ready to be selected as a recording medium. To reformat the CF medium, follow the same procedure as formatting the hard drive, substituting the CF menu selection for the hard drive.

Formatting the CF rebuilds the FAT (file allocation table) and erases any audio or other data files present on the medium. While some PC utilities can recover files immediately after formatting the drive, consider that the files have been permanently erased. FAT32 volumes generated by the 744T may not be compatible with numerous consumer electronic devices, including entry-level digital cameras.

*After recording is stopped, it can take several seconds for the 744T to finish “housekeeping” on CF. When preparing to remove the CF, always observe the amber activity LED for the CF medium. If it is lit, wait until it goes out before removing the CF. If the CF is removed while the LED is lit, at the very least the file will be corrupted and there is a possibility of FAT corruption as well.*

---

### Testing



CF cards varied widely in their write/read throughput. Later generation “24x” and greater CF cards can reliably read and write multi-track, high sample rate audio. The 744T includes a drive speed test to measure the throughput speed of CF medium. Measured numbers greater than 3000 KB/s can reliably write 24/96 x 4 channels.

---

*Not all CF medium can sustain write speeds for reliable 192 kHz recording. Use the speed test utility to make certain that installed medium can support the selected number of tracks at 192 kHz.*

---

### Drive Repair

The same drive repair utilities are available for the CF as the internal hard drive.

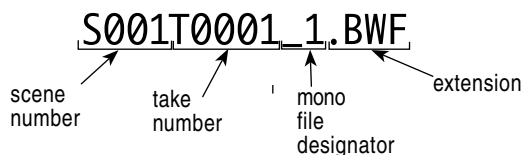
### Qualified CF Cards

Several CF mediums have been tested and “approved” for use in the 7-Series, including Lexar Media, SanDisk, and Kingston Technology cards in capacities ranging from 512 MB to 4 GB. It is not feasible for Sound Devices to test all available CF cards for compatibility or maximum throughput with the 744T. Use the CF transfer speed test to verify that an installed card can support the needed read/write speed.

## File Naming / Numbering

---

Files generated by the 744T are named using a syntax made up of four parts: scene number, take number, mono track designator (if mono file is selected), and extension.



### Scene Numbers

Scene numbers are user-selected in the setup menu and remain unchanged until changed by the user. Scene numbers start with the letter “S” followed by three-digit integers between 001 and 999. Scene numbers are helpful to match audio with the corresponding scene in production.

## Take Numbers

Take numbers are four-digit integers between 0001 and 9999, starting with the letter “T”. Take numbers increase by one each time a new file is generated. Take numbers auto-increment, although the take number can be overridden and a new take number can be selected in the setup menu. If the 744T detects a file with a duplicate name in the destination directory, the letter suffix, starting with “A” is added to the file name after the take number with poly files and after the track designator in mono files. Note that take number handling can be selected to reset to 0001 if “daily folder with take reset” is applied in the setup menu (see *File Management and Copying* on page 35).

## File Management and Copying

The 744T, like a computer, writes its audio recordings to a file system. That system is FAT32. The 744T formats its internal hard drive and Compact Flash medium as single volumes named “744T”. All files generated by the 744T are placed in the folder (directory) named SOUNDDEV. The 744T does not write to the root of the volume. If Daily Folders are selected, the 744T will generate a new folder, named by date, each day upon power-up. Otherwise all recorded files will be stored directly in the SOUNDDEV directory.

A hierarchical view of files generated by the 744T is below. Notice the volume name, SOUNDDEV folder, and daily folders, along with files contained within the folders.

```

744T
├── SOUNDDEV
│   ├── Y04M06D01
│   │   ├── S001T0001.BWF
│   │   ├── S001T0002.BWF
│   │   └── S001T0003.BWF
│   ├── Y04M06D02
│   │   ├── S001T0004.BWF
│   │   └── S001T0005.BWF
│   ├── Y04M06D02
│   │   ├── S002T0001.BWF
│   │   └── S002T0002.BWF
│   ├── S999T0001.MP3
│   └── S999T0002.MP3

```

## File Finder Navigation

Moving from file to file is similar to navigating among files on a computer.

1. Enter the file menu by either selecting **File:ViewFiles** file in the setup menu or by pressing the front panel HDD key. By default the current record folder is opened.
2. To move up the hierarchy scroll up to the top of the menu to “\..”.
3. Press enter or the Multi-Function Controller button to go up one menu level.
4. From the root menu, selecting \.. opens the media select screen.
5. Continuing up the file hierarchy the media menu is viewable. Select either internal hard drive or CF (if installed) and drill down through the directories of that medium to the file required.



---

*Larger files take added time to show details; this is normal.*

---

## File Directory Screen



The file directory screen contains information about the individual audio files contained in the directory. The left side of the display shows files and folders. The top line displays the directory path in the form of `media\folder name`. File names are listed in the order they were recorded.

---

*Data files not native to the 744T will show in the file directory view but no detail will be available. They will report as "Invalid File Format."*

---

File detail is shown at the right side of the display. The center divider points to the file selected for information viewing. Information shown includes:

- file creation date, file archive bit status, checked means the file archive bit is set, clear means the file archive bit is cleared
- file creation time, file size
- number of tracks, bit depth, sample rate
- beginning (BEG) time code stamp of the file for BWF files or the length (LEN) of MP3 files

---

*The file directories always exit to the main screen whether entered via the menus or the HDD key.*

---

## Setting/Clearing Flag Bits

Pressing the tone key in the file directory display opens the "Set or Clear Flag Bit" screen. The options for setting or clearing flag bits include: set or clear the selected file, set or clear all the files in the current folder, or set or clear all files on the volume.



---

*All files created by the 744T have their archive bit set to on.*

---

## Automatic Flag Clearing

The 744T can be set to clear the flag bit of copied files automatically. When enabled in the File: CopyFlagControl menu, all files copied internally by the 744T, but not via FireWire, will have their flag bits cleared on the original file.

## Folders

Files generated by the 744T are placed in either the root SOUNDDEV folder or a daily sub-folder within the SOUNDDEV folder. Options are chosen in the setup menu from the following:

- **Single folder** - all files are placed in a SOUNDDEV folder. This is appropriate for non-sync files such as wild sounds, effects, etc. Note that if many production days and many files are generated, this filing action can become cumbersome to manage.
- **Daily folder** - a new folder is generated in the SOUNDDEV folder each calendar day. All files recorded on that day are placed within it. The daily folder is made based on the onboard clock and used the syntax of "YxxMxxDxx, where Y is year, M is month, and D is day.
- **Daily folder w/take reset** - same as daily folder, with the file take number reset when a new daily folder is generated (at 12:00a).

## File Time and Date

Similar to a computer file system, all files recorded by the 744T are stamped with the time and date of file generation. To ensure that accurate time and file generation date are written with each file, make certain that the system time and date are accurately set.

---

*File time and date and time code are unrelated.*

---

1. Enter the TIME/DATE: Set menu.
2. Set the current time and date using the navigation below.



Once set, the time and date clock will be kept while the removable rechargeable battery is attached. If it is removed the internal AA NiMH time code battery maintains the date for up to 5 days.

## File Size Maximum

The 744T data volumes (internal hard drive and CF) are formatted and write to FAT32 file structures. This structure allows these drives to directly mount in a wide variety of computer platforms, including Windows and Mac OS. Using the FireWire connection both internal drives (internal hard drive and CF) appear as external FAT32 volumes.

---

*Windows XP has a limitation on FAT32 drive formatting; XP can format a FAT32 volume to a maximum of 32 GB, however it can read FAT32 volumes as large as 2 TB.*

---

FAT32 has a maximum file size limitation of 4 GB. While it is possible to have thousands of files on the 744T medium(s), the largest any single file may be is 4 GB. The 744T automatically splits an audio file before the 4 GB size is reached and begins writing to a new file. When joined in an editing program, these files match seamlessly with no samples lost. The 744T has menu-selectable file



size maximums of 650 MB, 1 GB, 2 GB, and 4 GB. The 650 MB size allows the user to break an audio program into CD-R sized files for backup to inexpensive CD-R medium.

### File Copying – Between Internal Drives

Audio files are easily transferred between CF and the 744T's hard drive. File transfer is initiated with the setup menu option **File:Copy File Select**.

The Copy File Select menu has four options for each media type:

**Copy All [Media] > [Media]:**

Copies all files from one media to the other.

**Last 24Hr [Media] > [Media]:**

Copies files created in the last 24 hours between media.

**Last 48Hr [Media] > [Media]:**

Copies files created in the last 48 hours between media.

**Flagged [Media] > [Media]:**

Copies all files with their archive bit set between.

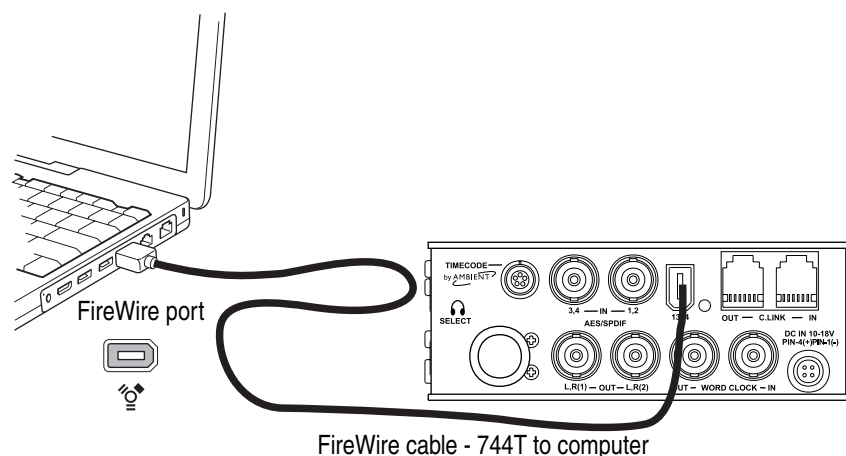
Once file copying has begun, the 744T searches the source media for the selected files. The 744T will then search the destination drive looking for duplicate file names. The LCD will report the number of files found, the number of duplicates found and the net number of files to be copied and prompt to continue.

Pressing the enter key or controller button begins copying. The LCD will report progress of the file being copied and the number of files remaining to be copied. When file copy is complete, the 744T will report the number of files successfully copied and show a progress bar showing the percentage of files successfully copied.

#### Error Conditions:

If a file is too large for the destination medium, the 744T will give you the option to skip it or cancel copying. If an error occurs during file copying, the 744T will prompt to cancel the transfer. When the destination medium is full, the 744T will report the error and end the transfer.

### File Transfer – FireWire



**Software revision 1.0 does not support drive mirroring to external FireWire volumes.**

The 744T's FireWire (IEEE-1394) port makes transfer of recorded files to a delivery medium quick and easy. When connected via a 6-pin FireWire cable, the internal media of the 744T will mount to the Mac or Windows platform as local drives. Using Windows Explorer, Mac Finder or any other file utility, files can be copied from the 744T directly to an edit system or to a host system for transfer to a removable delivery medium.



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*CompactFlash media must be present in the 744T upon FireWire connection to be properly mounted by the host computer. CF media may not be “hot-swapped” after mounting—directory corruption may occur. If the CF slot is empty when the 744T is connected to the host system, a drive letter will still be assigned, but will not be accessible.*

---

To connect the 744T for FireWire transfer:

1. Stop all playback and recording activity.
2. Interconnect the 744T to the host computer.
3. The 744T will now show COMPUTERCONNECTION in the LCD. While audio will still pass through the 744T, no recording or playback is possible.
4. Navigate the drives on the computer and copy all needed audio to local storage.

**To avoid possible directory corruption on the 744T internal media, always properly dismount the drives from the operating system. On Mac platforms, drag the drive icons to the trash. On Windows platforms, use the “Disconnect External Media” icon in the system tray.**

## Powering

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The 744T is powered from either a removable, Li-ion rechargeable battery or external DC power. The included, removable 7.2 V Li-ion cell can be used as either primary or backup power. The 744T automatically chooses the power source based on the voltage level of the external power supply. The transition between external and removable battery powering is seamless and has no affect on recording or playback operation.

One of the hallmarks of Sound Devices’ equipment is their power efficiency. During typical operation the 744T will run for approximately two hours from the included a 1500 mAh Li-ion battery.

### Lithium Ion Rechargeable Battery

The 744T is powered from Sony-compatible L- or M-type Li-ion rechargeable batteries. Numerous power capacities are available in these battery types, ranging from 1000 mAh to 6000 mAh. The 744T’s mount accommodates unlimited battery depth. Larger amp-hour cells provide more run time.

When powered by the removable Li-ion battery, the LCD displays the battery voltage level of the powering source. The nominal operating voltage for Li-ion batteries is 7.2 V, with operating voltages ranging between 6.5–8.5 V. When the battery drops to 6.5 V, the LCD voltage display and the power LED begin flashing to warn that the battery is nearly depleted. When the voltage reaches 6.3 volts the 744T will power down—any recordings in-process will automatically be closed (stopped).

### External Powering and Battery Charging

The 744T can be powered externally from 12–18 VDC (2 amp minimum). External DC fully powers the unit and charges an attached Li-ion battery simultaneously using the 744T’s onboard Li-ion charger. The charger circuit operates whenever the unit is powered on and optionally when the unit is off, depending on the external power wiring (*see below*).

DC input uses a 4-pin Hirose connector (Part # HR10-7P4P). There are two connection options available:

| External DC Input Wiring   | Operation  |
|--|--|
| pin-2 to negative (-)<br>pin-3 to positive (+)   | operates the on-board Li-ion charger when the unit is both turned on and off. Use when plugged into AC power   |
| pin-1 to negative (-)<br>pin-4 to positive (+)   | operates the on-board Li-ion charger only when the unit is turned on—there is no external current draw when powered off. Use when connecting to an external battery pack |
| Regardless of whether pins-1 and -4 or pins-2 and -3 are used, the unit will always charge the Li-ion battery when the unit is powered on. |  |

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*Pin-1 and pin-2 of the external DC input are at the same ground potential as chassis and signal ground.*

---

The voltage level of the source powering the unit is shown on the LCD (**EXT 12.00**). When the 744T senses a low voltage condition from an external DC source the power LED and battery voltage display flashes, to alert the user. When the external DC reaches 9 volts, the 744T will automatically switch over to the removable battery. If no battery is installed the unit will shut down.

The included AC-to-DC “wall-wart” power supply operates the unit and charges the removable batteries simultaneously. Pins-3 and -4 are wired to (+) and pins-1 and -2 are wired to (-).

When power is applied, the charging circuit evaluates the battery condition and supplies charging current, if necessary. When charging, the amber charge LED will flash. Once the battery is fully charged, the charger will turn off and the amber charge LED will light solid, indicating a full charge.

| Charge LED Activity | Description of Activity                          |
|---------------------|--|
| Off                 | Charger disabled                                 |
| On                  | Completed charge / battery fully charged         |
| 1 blink             | Charger enabled / battery is charging            |
| 2 blinks            | No Li-ion battery attached                       |
| 3 blinks            | High/low internal temperature state              |
| 4 blinks            | Battery level error code (>15 min. in slow mode) |
| 5 blinks            | 8 hour time limit error code                     |

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*If the charge LED shows anything but a successful charge, the Li-ion battery may require replacement.*

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## Time Code Clock Battery

The 744T has an internal NiMH LR6 (AA) battery to power to the time code generator circuitry and time-of-day clock. This battery is charged simultaneously with the Li-ion battery. Additionally, the AA is charged from the Li-ion battery when the unit is powered on.

With a fully charged AA battery, accurate time code is held for eight hours after power down. Because of this battery the 744T can be powered down without worry of time code jumps or inaccuracy. When the NiMH battery is near depletion, the time code generator will shut off and the time-of-day clock keep running for up to one month.

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*744T maintains accurate time code for 8 hours after power-down with a fully charged NiMH battery time code AA battery, even with the Li-ion and external DC removed.*

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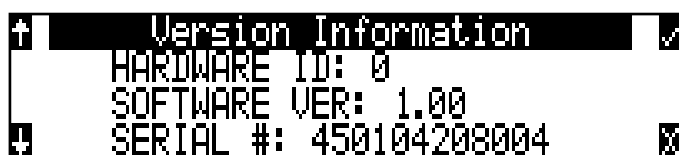
## Firmware Upgrades

The 744T uses upgradable EEPROM (electrically erasable programmable read-only memory) to hold the unit's operating system software, or firmware. Firmware is the source code which controls all aspects of the device, including: menu options, signal routing, signal processing, LED's, controls, and data ports.

### Version Information

During manufacturing the unit's hardware revision number and serial number are burned into a protected area of the EEPROM and are not changeable. These numbers are viewed in the Info:Version selection of the setup menu. Info:Version also shows the firmware version of the recorder.

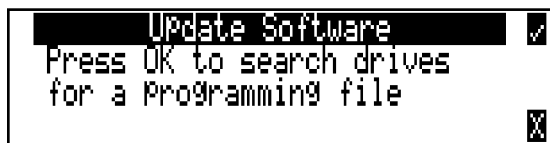
The 744T firmware version and unit serial numbers are written to the data chunk of every WAV and BWF audio file generated by the 744T.



### Upgrade Process

From time to time Sound Devices may issue revisions (new versions) of firmware for the 744T. Firmware is user-upgradeable. To upgrade firmware follow the steps below.

1. Download the firmware file from the Sound Devices web site or obtain it on disk.
2. Transfer the firmware file (it will be named `version_number.prg`) to the 744T internal hard drive via FireWire or onto a CF card. If there are multiple firmware files on the media, the 744T will select the first firmware file available. There is no provision to skip to the next file. To prevent confusion, ensure that there is only one firmware file available on any 744T media.
3. Enter the firmware upgrade menu. You will be prompted to search for the firmware file. If a valid firmware file is present on either the internal hard drive or CF the recorder will prompt if the path is the proper file to use. Press the Multi-Function Controller or the tone key to say yes. The 744T will begin firmware upgrade and validation. Progress is indicated with a bar graph.



4. When the upgrade and verify process is complete, power cycle the 744T. On power-up the LCD will turn solid black and the green LED next to the FireWire port will blink 20 times. When the update sequence is complete, the 744T will reboot once again.
5. Verify the firmware version using the Info:Software menu.
6. Reset the time-of-day clock to the present time and date. Reset the time code to an appropriate value.

*Firmware upgrades are designed to preserve all user menu settings. As a precaution, we recommend saving the present state as a setup file on the hard drive or CF. Once a firmware upgrade is complete, restore settings from this file, if necessary.*

## Setup Menu Presets

Presets are useful shortcuts to speed setting the numerous parameters available in the setup menu. The 744T has four built-in presets and unlimited user presets.

### Built-In Presets

The 744T is shipped from the factory with the factory preset applied. Its settings are listed below. Three additional presets, film, reporter, and music presets allow for quick setup of typical parameters for the defined application. Presets are applied by entering the setup menu and selecting the preset. All previous settings are lost when a preset is applied.

| Parameter                  | Factory Preset  | Film Preset     | Reporter Preset   | Music Preset    |
|----------------------------|-----------------|-----------------|-------------------|-----------------|
| Sample Rate                | 48 kHz          | 48 kHz          | 44.1 kHz          | 44.1 kHz        |
| Bit Depth                  | 24 bit          | 24 bit          | 16 bit            | 16 bit          |
| Input 1,2 Gain Controls    | unlinked        | unlinked        | unlinked          | linked          |
| Record Dither              | off             | off             | on                | on              |
| Pre-Record Buffer Time     | 0               | 2               | 2                 | 2               |
| Input 1 Delay              | 0               | 0               | 0                 | 0               |
| Input 2 Delay              | 0               | 0               | 0                 | 0               |
| Input 3 Delay              | 0               | 0               | 0                 | 0               |
| Input 4 Delay              | 0               | 0               | 0                 | 0               |
| LED Brightness             | 10              | 10              | 10                | 10              |
| LCD Backlight Enable       | enabled         | enabled         | enabled           | enabled         |
| LCD Backlight Mode         | normal          | normal          | normal            | normal          |
| LCD Contrast               | 50              | 50              | 50                | 50              |
| Meter Ballistics           | Peak+VU         | Peak+VU         | Peak+VU           | Peak+VU         |
| Input #3 Gain              | +20 dBu         | +20 dBu         | +20 dBu           | +20 dBu         |
| Input #4 Gain              | +20 dBu         | +20 dBu         | +20 dBu           | +20 dBu         |
| Input #3/4 Source          | auto            | auto            | auto              | auto            |
| Input #1 Low-cut mode      | 0               | 0               | 80 Hz, 18 dB/oct. | 0               |
| Input #2 Low-cut mode      | 0               | 0               | 80 Hz, 18 dB/oct. | 0               |
| Limiter Enable             | on              | on              | on                | off             |
| Input Peak LED Threshold   | -3 dBFS         | -3 dBFS         | -3 dBFS           | -3 dBFS         |
| Track Peak LED Threshold   | 0               | 0               | 0                 | 0               |
| Timecode Frame Rate        | 30ND            | 30ND            | 30ND              | 30ND            |
| Timecode Mode              | free run        | free run        | off               | off             |
| Timecode User Bit Mode     | mm:dd:yy:tt     | mm:dd:yy:tt     | mm:dd:yy:tt       | mm:dd:yy:tt     |
| Time Format                | 12 hour         | 12 hour         | 12 hour           | 12 hour         |
| Date Format                | MM/DD/YYYY      | MM/DD/YYYY      | MM/DD/YYYY        | MM/DD/YYYY      |
| Record Timer Enable        | Off             | off             | off               | off             |
| Start Timer enable         | Off             | off             | off               | off             |
| Record Take Count          | 1               | 1               | 1                 | 1               |
| Record File Format         | poly WAV        | mono WAV        | MP3 128           | poly WAV        |
| Media Select               | CF & hard drive | CF & hard drive | hard drive        | CF & hard drive |
| Marker Mode                | Off             | new file        | new file          | new file        |
| Marker Pre-roll            | disabled        | disabled        | disabled          | disabled        |
| Auto-file-split Size       | 4 GB            | 4 GB            | 4 GB              | 4 GB            |
| Digital Output Source      | Tr A/B          | Tr A/B          | Tr A/B            | Tr A/B          |
| Digital Output Attenuation | 0 dB            | 0 dB            | 0 dB              | 0 dB            |

| Parameter                                 | Factory Preset | Film Preset | Reporter Preset | Music Preset |
|---|----------------|-------------|-----------------|--------------|
| Line Output Source                        | Tr C/D         | Tr C/D      | Tr C/D          | Tr C/D       |
| Line Output Attenuation                   | 0              | 0           | 0               | 0            |
| HPMon1                                    | inputs1/2      | inputs1/2   | inputs1/2       | inputs1/2    |
| HPMon2                                    | inputs 3/4     | inputs 3/4  | inputs 3/4      | inputs 3/4   |
| HPMon3                                    | tracks A/B     | tracks A/B  | tracks A/B      | tracks A/B   |
| HPMon4                                    | tracks C/D     | tracks C/D  | tracks C/D      | tracks C/D   |
| HPMon5                                    | input 1        | input 1     | input 1         | input 1      |
| HPMon6                                    | input 2        | input 2     | input 2         | input 2      |
| HPMon7                                    | input 3        | input 3     | input 3         | input 3      |
| HPMon8                                    | input 4        | input 4     | input 4         | input 4      |
| HPMon9                                    | mon A/B        | mon A/B     | mon A/B         | mon A/B      |
| HPMon10                                   | mon C/D        | mon C/D     | mon C/D         | mon C/D      |
| HPMon11                                   | end of list    | end of list | end of list     | end of list  |
| HPMon12                                   | -              | -           | -               | -            |
| HPMon13                                   | -              | -           | -               | -            |
| HPMon14                                   | -              | -           | -               | -            |
| HPMon15                                   | -              | -           | -               | -            |
| HPMon16                                   | -              | -           | -               | -            |
| HPMon17                                   | -              | -           | -               | -            |
| HPMon18                                   | -              | -           | -               | -            |
| HPMon19                                   | -              | -           | -               | -            |
| HPMon20                                   | -              | -           | -               | -            |
| Number of HP Monitor Modes                | 10             | 10          | 10              | 10           |
| Current HP Monitor Mode                   | Tr A/B         | Tr A/B      | Tr A/B          | Tr A/B       |
| HP Monitor Favorite Mode                  | Tr A/B         | Tr A/B      | Tr A/B          | Tr A/B       |
| Headphone Monitor Controller Sw. Function | fav. mode      | fav. mode   | fav. mode       | fav. mode    |
| Input Routing Selection                   | 4-track        | 4-track     | mono 2          | stereo       |
| Record Folder Option                      | daily          | take clear  | daily           | daily        |
| Tone Level (relative to 0 dBFS)           | -20            | -20         | -12             | -12          |
| Tone Frequency                            | 1 kHz          | 1 kHz       | 1 kHz           | 1 kHz        |
| Tone Mode                                 | Tr & outs      | Tr & outs   | Tr & outs       | Tr & outs    |
| Channel #1 Phantom Power                  | off            | on          | on              | on           |
| Channel #2 Phantom Power                  | off            | on          | on              | on           |
| Input 1/2 Source                          | auto           | auto        | auto            | auto         |
| Input 1/2 Control                         | knobs          | knobs       | knobs           | knobs        |
| Input 1 Gain                              | 20 dB          | 20 dB       | 20 dB           | 20 dB        |
| Input 2 Gain                              | 20 dB          | 20 dB       | 20 dB           | 20 dB        |
| External Voltage Threshold                | 11 VDC         | 11 VDC      | 11 VDC          | 11 VDC       |
| Clear Source Flag Bit after File Copy     | enabled        | enabled     | enabled         | enabled      |
| Auto-Play mode                            | play all       | play all    | play all        | play all     |

## User Setups

All of the set parameters in the table above can be saved in a file to internal hard drive or to CF card. By entering the Get/Save Setup Menu, the user can save or retrieve parameters to a data file. This binary file is named 744T.SUP and is saved in the SOUNDDEV directory on the selected medium.

## Setup Menu

The setup menu controls a wide range of parameters for the 744T, including all audio routing, recording settings, and time code options. The setup menu is a single, flat architecture with no sub-menus, easing navigation. Each setup controls a specific parameter with several selections. The chart below shows the setup number, a description of the control, and the menu options available.

| #  | Setup Name                | Setup Description   | Setup Parameters  |
|----|---------------------------|---|---|
| 1  | <b>Quick Setup</b>        | Allows the user to quickly apply default menu setups and save/retrieve user setups to disk or CF.   | <ul style="list-style-type: none"> <li>• Load Factory Settings<br/>- restores the factory default settings</li> <li>• Load Film Settings<br/>- applies typical setups for film production</li> <li>• Load Music Settings<br/>- applies typical setups for music recording</li> <li>• Load User from INHDD<br/>- applies settings saved by user to hard disk</li> <li>• Load User from CF<br/>- applies settings saved by user to CF</li> <li>• Save User to INHDD<br/>- saves present state to file on hard drive</li> <li>• Save User to CF<br/>- saves present state to file on CF</li> </ul> |
| 2  | <b>Rec: Sample Rate</b>   | Sets the audio sampling frequency of the 744T   | <ul style="list-style-type: none"> <li>• 32 kHz</li> <li>• 44.1 kHz</li> <li>• 48 kHz</li> <li>• 48.048 kHz</li> <li>• 88.2 kHz</li> <li>• 96 kHz</li> <li>• 96.096 kHz</li> <li>• 174.4 kHz</li> <li>• 192 kHz</li> </ul>  |
| 3  | <b>Rec: Bit Depth</b>     | Sets the bit depth of the 744T recordings.  | <ul style="list-style-type: none"> <li>• 16 bit,</li> <li>• 24 bit</li> </ul>   |
| 4  | <b>File: Format</b>       | Selects the file format type recorded to the selected medium. WAV and BWF files are identical, the only difference is the file extension. | <ul style="list-style-type: none"> <li>• .WAV poly</li> <li>• .WAV mono</li> <li>• .BWF poly</li> <li>• .BWF mono</li> <li>• .MP3 – 64 kb/s • 96 kb/s • 128 kb/s • 160 kb/s • 192 kb/s • 256 kb/s • 320 kb/s</li> </ul>   |
| 5  | <b>Rec: Media Select</b>  | Selects the media used for recording. All media are selectable even if not present.   | <ul style="list-style-type: none"> <li>• IN HDD Only</li> <li>• CF Only</li> <li>• IN HDD and CF</li> </ul>   |
| 6  | <b>Rec: Take Counter</b>  | Reset-able numeric counter that increments every time record is pushed. Used to create unique file names.                                 | <number>  |
| 7  | <b>Rec: Scene Number</b>  | Numeric scene number used for file naming.  | <number>  |
| 8  | <b>Rec: Pre-Roll Time</b> | Selects the amount of pre-roll time the 744T will add to the beginning of each file.  | 0–10 sec. @ 48 kHz<br>0–5 sec. @ 88.2–96.096 kHz<br>0–3.5 sec. @ 192 kHz  |
| 9  | <b>Rec: Dither</b>        | Selects whether to dither is added to 24 bit digital signals while recording 16 bit files.  | <ul style="list-style-type: none"> <li>• Off</li> <li>• On (16 bit only)</li> </ul>   |
| 10 | <b>Rec: Timer Start</b>   | Sets a specific start time/date for unattended recording. Unit must be powered.   | <enter time, date>  |

| #                    | Setup Name   | Setup Description  | Setup Parameters  |
|----------------------|--|--|---|
| 11                   | <b>Rec: Timer Stop</b>   | Set a specific time/date to stop recording. May be used with or without the Rec: Timer Start. May be set before the Timer Start time to temporarily stop recording and then resume recording with Timer Start.   | <enter time, date>  |
| 12                   | <b>Rec: Error Handler</b>  | Sets the behavior when a hard drive write error occurs.  | <ul style="list-style-type: none"> <li>• Stop recording</li> <li>• Create New Take</li> </ul>   |
| 13                   | <b>Input: Routing</b>  | Allows the user to setup their routing matrix among all available inputs and tracks. There are four preset routings and one custom routing available. Pressing the input select key repeatedly will cycle through all preset routings.<br><br><i>Primarily accessible from the Input Select Key.</i> | <ul style="list-style-type: none"> <li>• 1 → A / 2 → B</li> <li>• 1 → A / 1 → B</li> <li>• 1 → A,B / 2 → A,B</li> <li>• 1 → A / 2 → B / 3 → C / 4 → D</li> <li>• 1,2,3 → A / 1 → B / 2 → C / 3 → D</li> <li>• 1 → A,C / 2 → B,D</li> <li>• 3 → C / 4 → D</li> <li>• Custom Route</li> </ul>   |
| 14<br>15             | <b>Input 1: 48V Phantom</b><br><b>Input 2: 48V Phantom</b>   | Enables or disables 48 V phantom power on inputs 1 and 2.  | <ul style="list-style-type: none"> <li>• Off</li> <li>• On - Mic</li> <li>• On - Mic and Line</li> </ul>  |
| 16                   | <b>Mic Inputs: Limiter</b>   | Enables or disables the analog input limiter on input 1 and 2 mic preamps.   | <ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>   |
| 17<br>18             | <b>Mic Input 1: Low Cut</b><br><b>Mic Input 2: Low Cut</b>   | Enables the high-pass (low cut) filter to reduce sensitivity to low frequencies.   | <ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>   |
| 19<br>20             | <b>Mic Input 1: Low Cut Freq</b><br><b>Mic Input 2: Low Cut Freq</b>   | Selection of twelve high-pass filter frequency and slope combinations for microphone inputs.   | <ul style="list-style-type: none"> <li>• 40, • 80, • 160, • 240 Hz @ 12 dB/oct</li> <li>• 40, • 80, • 160, • 240 Hz @ 18 dB/oct</li> <li>• 40, • 80, • 160, • 240 Hz @ 24 dB/oct</li> </ul>   |
| 21<br>22             | <b>Mic Input 1: Gain Range</b><br><b>Mic Input 2: Gain Range</b>   | Selects the sensitivity of the microphone input. Low sensitivity is used for very loud and/or very hot microphones.  | <ul style="list-style-type: none"> <li>• Normal</li> <li>• Low</li> </ul>   |
| 23<br>24             | <b>Input 1, 2: Source</b><br><b>Input 3, 4: Source</b>   | Forces the inputs to analog or digital mode. Default is auto-select.   | <ul style="list-style-type: none"> <li>• Auto-select</li> <li>• Analog</li> <li>• Digital (S/PDIF/AES)</li> <li>• Disabled (Power Save)</li> </ul>  |
| 25                   | <b>Input 1,2: Linking, MS</b>  | Selects whether the input 1 & 2 levels are controlled independently or grouped as a pair with or without mid-side decoding.  | <ul style="list-style-type: none"> <li>• Unlinked<br/>Inputs 1 and 2 operate independently</li> <li>• Linked 1/2<br/>Inputs are linked, channel 1 pot controls level, channel 2 pot controls pan</li> <li>• Linked 1/2 and MS<br/>Inputs are linked, channel. 1 pot controls level, channel. 2 pot controls pan and are decoded for MS stereo.</li> </ul> |
| 26                   | <b>Line Input 1,2: Gain Control</b>  | When inputs 1 and 2 are in LINE input mode, selects whether the gain setting is controlled by the front panel knobs or by the menu sensitivity settings below.   | <ul style="list-style-type: none"> <li>• Use front panel knobs</li> <li>• Use sensitivity settings</li> </ul>   |
| 27<br>28<br>29<br>30 | <b>Line Input 1: Gain</b><br><b>Line Input 2: Gain</b><br><b>Line Input 3: Gain</b><br><b>Line Input 4: Gain</b> | Adjusts the input sensitivity in 0.1 dB steps -6 dB and +18 dB.  | Meters show a pre-fader level of the input signal of all four inputs on their respective meters to aid in the adjustment.   |
| 31<br>32<br>33<br>34 | <b>Input 1: Delay</b><br><b>Input 2: Delay</b><br><b>Input 3: Delay</b><br><b>Input 4: Delay</b>                 | Sets a digital delay for each input. Can be used to compensate for delay in various digital wireless microphone units or digital processors.   | 0 µsec to 30,000 µsec up to 48.048 kHz Fs<br>0 µsec to 15,000 µsec up to 96.096 kHz Fs<br>0 µsec to 7,500 µsec up to 192 kHz Fs   |

| #  | Setup Name                     | Setup Description  | Setup Parameters   |
|----|--------------------------------|--|--|
| 35 | <b>File: Marker Mode</b>       | Enables the user to set cue points on the fly while recording by pressing the record key.  | <ul style="list-style-type: none"> <li>• Markers disabled<br/>No cue marks are set.</li> <li>• New Cue<br/>Cue markers will be set within one contiguous file.</li> <li>• New File<br/>A new file is started with each press of the record key, the take counter is increased by one.</li> </ul>   |
| 36 | <b>File: Marker Pre-roll</b>   | New files created by the marker mode can have the selected amount of pre-roll appended to the beginning of each file, when enabled.  | <ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>  |
| 37 | <b>File: Max Size</b>          | <p>Selects the file size where the 744T will close, then start a new file. The 744T will not record a file larger than the selected size.</p> <p><i>The largest file permissible with the 744T's FAT32 file system is 4 GiB</i></p>  | <ul style="list-style-type: none"> <li>• OFF (4 GiB)</li> <li>• 4 GB</li> <li>• 2 GB</li> <li>• 1 GB</li> <li>• 640 MB</li> </ul>  |
| 38 | <b>File: Folder Options</b>    | Selects whether files are placed in the main "SOUNDDEV" folder, or a new folder for each production day.   | <ul style="list-style-type: none"> <li>• Single folder</li> <li>• Daily folder</li> <li>• Daily folder with take/clear (reset to 1)</li> </ul>   |
| 39 | <b>File: View Files</b>        | Enters the file directory tree for the selected drive.   | Highlight media descriptor to navigate the menu  |
| 40 | <b>File: Copy File Select</b>  | Allows the user to select a file or a range of files to be copied from one media to another. Files will only be copied from their current directory to a directory of the same name on the other media. If a file will not fit on the destination media, user is given the option to skip that file and continue with the copy or abort the copy all together. User is advised at the end of the copy process how many files were copied successfully. | <ul style="list-style-type: none"> <li>• Copy all In HDD → CF<br/>Copies all files and directories from the internal hard drive to the Compact Flash.</li> <li>• Last 24 hr → CF<br/>Copies all files recorded in the last 24 hours from the hard drive to the Compact Flash.</li> <li>• Last 48 hr → CF<br/>Copies all files recorded in the last 48 hours from the hard drive to the Compact Flash.</li> <li>• Flagged In HDD → CF<br/>Copies all files on the internal hard drive, that have their flag bit set to Compact Flash.<br/><i>All files, when recorded, automatically have their flag bit set to "on"</i></li> <li>• Copy All CF → In HDD<br/>Copies all files and directories on the Compact Flash to the hard drive.</li> <li>• Last 24 hr → In HDD<br/>Copies all files recorded in the last 24 hours from the Compact Flash to the hard drive.</li> <li>• Last 48 hr → In HDD<br/>Copies all files recorded in the last 48 hours from Compact Flash to the hard drive.</li> <li>• Flagged CF → In HDD<br/>Copies all files from the Compact Flash, that have their flag bit set, to the hard drive.</li> </ul> |
| 41 | <b>File: Copy Flag Control</b> | Selects whether the flag bit is cleared or not on files copied from one media to another.  | <ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>  |



| #  | Setup Name                       | Setup Description  | Setup Parameters  |
|----|----------------------------------|--|---|
| 42 | <b>Time Code: Frame Rate</b>     | Sets the time code frame rate. All common time code frame rates are available.   | <ul style="list-style-type: none"> <li>• 23.976 – used with high definition video cameras</li> <li>• 24 – to sync audio to film where no transfer to NTSC video is expected</li> <li>• 25 – to sync sound to PAL video</li> <li>• 29.97 – to sync sound to NTSC video shot in non-drop frame mode</li> <li>• 29.97DF – to sync sound to NTSC video shot in drop frame mode</li> <li>• 30 – to sync sound to film where transfer to NTSC video is expected</li> <li>• 30DF – to sync sound to film for transfer to NTSC video in drop-frame mode</li> </ul>  |
| 43 | <b>Time Code: Mode</b>           | Sets the mode for the time code generator  | <ul style="list-style-type: none"> <li>• Off – time code not active, recorded or output</li> <li>• Free Run – time code is initialized from the jam menu and then runs continuously regardless of record mode</li> <li>• Continuous Jam – time code is initialized from an external source and updates itself to the external source when reconnected</li> <li>• Record Run – time code is set from the jam value item in the jam menu. Time code generation starts and stops with the record key creating continuous time code from file to file.</li> <li>• 24 Hr Run – time code is initialized from the system clock on startup and enters free run mode. Time code is updated if the time of day clock is adjusted.</li> </ul> |
| 44 | <b>Time Code: User Bits</b>      | Sets the time code user bits generated by the 744T.  | <ul style="list-style-type: none"> <li>• Not Used – user bits are not set or output</li> <li>• yy:mm:dd.tt – user bits are set to a North American-style date with take counter</li> <li>• yy:dd:mm.tt – user bits are set to a European-style date with take counter</li> <li>• uu:uu:tt.tt – user bits are set to 4 user definable digits with 4 take digits</li> <li>• tt:tt:tt.tt – user bits are set to the take counter for all 8 digits</li> </ul>   |
| 45 | <b>Time Code: Jam Menu</b>       | Allows the user to jam or edit the internal time code generator and user bits. (Also accessible by pressing HDD and Menu keys simultaneously). | <ul style="list-style-type: none"> <li>• Jam RX TC – jams the internal generator to received external code</li> <li>• Jam Zeros – resets the internal generator to zero</li> <li>• Jam Value – sets the internal generator to the value set in edit value</li> <li>• Edit Value – allows to user to enter a free-form number to initialize the time code</li> <li>• Edit U-Bit – allows the user to edit allowed user bit numbers</li> </ul>  |
| 46 | <b>Output 1 L,R: Source</b>      | Selects the signal source for the Master Output Bus (TA3 outputs, tape outputs, and digital 1 outputs.   | <ul style="list-style-type: none"> <li>• inputs 1 / 2</li> <li>• inputs 3 / 4</li> <li>• tracks A / B</li> <li>• tracks C / D</li> <li>• monitor A / B (post-record monitor)</li> <li>• monitor C / D (post-record monitor)</li> </ul>  |
| 47 | <b>Output 1 L,R: Attenuation</b> | Selects the attenuation level of signal sent to the Master Output Bus.   | selectable from 0 to –40 dBFS   |

| #  | Setup Name                         | Setup Description   | Setup Parameters  |
|----|------------------------------------|---|---|
| 48 | <b>Output 2 L,R: Source</b>        | Selects the signal source for output bus 2 sent to digital output bus 2.  | <ul style="list-style-type: none"> <li>• inputs 1 / 2</li> <li>• inputs 3 / 4</li> <li>• tracks A / B</li> <li>• tracks C / D</li> <li>• monitor A / B (post-record monitor)</li> <li>• monitor C / D (post-record monitor)</li> </ul>  |
| 49 | <b>Output 2 L,R: Attenuation</b>   | Selects the attenuation level of the signal output to bus 2.  | selectable from 0 to -40 dBFS   |
| 50 | <b>Play: AutoPlay Mode</b>         | <p>Allows user to play file(s) consecutively from selected directory, one time through or continuously.</p> <p><i>Great for playing an MP3 collection during down time!</i></p>   | <ul style="list-style-type: none"> <li>• Disabled</li> <li>• Play all</li> <li>• Repeat one</li> <li>• Repeat all</li> </ul>  |
| 51 | <b>Time/Date: 12/24 Hr</b>         | Selects between 12 hour and 24 hour time.   | <ul style="list-style-type: none"> <li>• 12 hr</li> <li>• 24 hr</li> </ul>  |
| 52 | <b>Time/Date: Date Format</b>      | Selects the date syntax of the recorder.  | <ul style="list-style-type: none"> <li>• mm/dd/yyyy</li> <li>• yyyy/dd/mm</li> </ul>  |
| 53 | <b>Time/Date: Set</b>              | <p>Sets the internal date and time of the 744T.</p> <p><i>Resetting the time re-jams the internal time code generator to the set time. Setting the internal clock during a production day will require time code devices to be re-jammed.</i></p> | <p>&lt;time, date&gt;</p> <p><i>Clock is not set until &lt;done&gt; is selected</i></p>   |
| 54 | <b>LCD: Contrast</b>               | Sets the contrast level of the LCD display. In normal operation, should only need to be set once  | 0–100%  |
| 55 | <b>Meter: Ballistics</b>           | Selects among five different meter ballistics settings  | <ul style="list-style-type: none"> <li>• VU only</li> <li>• Peak only</li> <li>• Peak-hold only</li> <li>• Peak+VU</li> <li>• Peak-hold + VU</li> </ul>   |
| 56 | <b>Meter: Peak Threshold</b>       | User-set level in dBFS where track peak LED's illuminate. 0 LED doubles as track peak indicator.  | 0 to –20 dBFS (1 dB increments)   |
| 57 | <b>Meter: Stealth Mode</b>         | Enables LEDs to toggle on and off with the LCD backlight key.   | <ul style="list-style-type: none"> <li>• Off</li> <li>• On</li> </ul>   |
| 58 | <b>HP: Encoder Switch Function</b> | Selects the functionality of the Multi-Function Controller's button when in record and playback.  | <ul style="list-style-type: none"> <li>• Disabled: push makes no change to the headphone matrix.</li> <li>• Selects Favorite Mode: in record and playback modes, push will change the headphone source immediately to the favorite selected in HP: Favorite Mode.</li> <li>• Headphones to C/D: momentarily shows headphone level on tracks C &amp; D LED meters.</li> <li>• Playback/Monitor Drive Select: Selects the media source for file playback and record monitoring</li> </ul> |
| 59 | <b>HP: Monitor Modes</b>           | Select the sequence of the modes that appear in the Headphone Source Display on the LCD.  | Up to 20 source selections can be entered, in any order. See headphone monitor section in guide for adjustment.   |

| #  | Setup Name                    | Setup Description  | Setup Parameters  |  |
|----|-------------------------------|--|---|--|
| 60 | <b>HP: Favorite Mode</b>      | Selects the audio source monitored when the Multi-Function Controller is pressed during recording or playback.   | <ul style="list-style-type: none"> <li>• inputs 1 / 2</li> <li>• inputs 3 / 4</li> <li>• tracks A / B</li> <li>• tracks C / D</li> <li>• monitor A / B</li> <li>• monitor C / D</li> <li>• input 1</li> <li>• input 2</li> <li>• input 3</li> <li>• input 4</li> <li>• track A</li> <li>• track B</li> </ul>                      | <ul style="list-style-type: none"> <li>• track C</li> <li>• track D</li> <li>• monitor A</li> <li>• monitor B</li> <li>• monitor C</li> <li>• monitor D</li> <li>• inputs 1,2 (MS)</li> <li>• inputs 3,4 (MS)</li> <li>• tracks 1,2 (MS)</li> <li>• tracks 3,4 (MS)</li> <li>• monitor 1,2 (MS)</li> <li>• monitor 3,4 (MS)</li> </ul> |
| 61 | <b>HP: Playback Mode</b>      | Selects the audio source sent to headphones upon playback.   | <ul style="list-style-type: none"> <li>• no change</li> <li>• inputs 1 / 2</li> <li>• inputs 3 / 4</li> <li>• tracks A / B</li> <li>• tracks C / D</li> <li>• monitor A / B</li> <li>• monitor C / D</li> <li>• input 1</li> <li>• input 2</li> <li>• input 3</li> <li>• input 4</li> <li>• track A</li> <li>• track B</li> </ul> | <ul style="list-style-type: none"> <li>• track C</li> <li>• track D</li> <li>• monitor A</li> <li>• monitor B</li> <li>• monitor C</li> <li>• monitor D</li> <li>• inputs 1,2 (MS)</li> <li>• inputs 3,4 (MS)</li> <li>• tracks 1,2 (MS)</li> <li>• tracks 3,4 (MS)</li> <li>• monitor 1,2 (MS)</li> <li>• monitor 3,4 (MS)</li> </ul> |
| 62 | <b>HP: Warning Bell Level</b> | Set the output level of the multi-function warning bell.   | off, -60 to 0 dBFS in 1 dB steps  |  |
| 63 | <b>Tone: Level</b>            | Set the output level of the reference tone   | -40 to 0 dBFS in 1 dB steps   |  |
| 64 | <b>Tone: Frequency</b>        | Allows the user to set the frequency of the reference tone oscillator  | 100-10,000 Hz in 100 Hz steps   |  |
| 65 | <b>Tone: Mode</b>             | Select the destination of the reference tone or to disables it completely  | <ul style="list-style-type: none"> <li>• disabled</li> <li>• to record tracks only</li> <li>• to outputs only</li> <li>• to record tracks and outputs</li> </ul>  |  |
| 66 | <b>In HDD: Test</b>           | Performs a write/read speed test on the internal hard drive. Data transfer speed is measured in KB/s.  | <i>Caution: Drive test will disable processing and mute outputs for duration of test. Outputs will not return until test is exited.</i>   |  |
| 67 | <b>In HDD: Space</b>          | Shows the drive file system, total size, and space remaining on the internal hard drive.   |   |  |
| 68 | <b>In HDD: (Erase)</b>        | Formats the internal hard drive.<br><i>Caution, while various PC utilities are able to recover files from a re-formatted drive, once formatted old audio data is not accessible by the 744T.</i> |   |  |
| 69 | <b>In HDD: Repair</b>         | Runs a utility to repair minor errors in the directory (FAT) of the drive.   |   |  |
| 70 | <b>CF: Test</b>               | Performs a speed test on the Compact Flash media installed. Data transfer speed is measured in KB/s.   | <i>Caution: Drive test will disable processing and mute outputs for duration of test. Outputs will not return until test is exited.</i>   |  |
| 71 | <b>CF: Space</b>              | Shows the drive file system, total size, and space remaining on connected Compact Flash medium.  |   |  |

| #  | Setup Name                      | Setup Description  | Setup Parameters                                     |
|----|---------------------------------|--|--|
| 72 | <b>CF: (Erase)</b>              | Formats installed Compact Flash medium<br><i>Caution, while various PC utilities are able to recover files from re-formatted drives, once formatted, old audio data is not accessible by the 744T.</i> |  |
| 73 | <b>CF: Repair</b>               | Runs a utility that will repair minor errors in the directory structure of the Compact Flash.  |  |
| 74 | <b>Balance Cal</b>              | Calibrates the center position of the input 2 pot when used as the balance control for MS recording.   | Place balance control to center and press to select. |
| 75 | <b>Power: Ext Low Batt Volt</b> | Sets the warning voltage of the low battery alert with an external power source. Internal battery warning threshold is factory set.  | 10.0–18.0 VDC, 0.1 V steps                           |
| 76 | <b>Info: Version</b>            | Shows the current hardware revision, hardware serial number, and firmware version.   |  |
| 77 | <b>Update Software</b>          | Upgrade tool used to apply new firmware as provided by Sound Devices. Will search all available media for the firmware program file and apply the update.  |  |

# Specifications

## System

|  |  |
|--|--|
| <b>Sampling Frequency</b>                | internal: 32, 44.1, 48, 48.048, 88.2, 96, 96.096, 176.4, 192 kHz<br>external: 32–192 kHz via word clock input                              |
| <b>Internal Data Path and Processing</b> | 32 bit, 192 dB dynamic range   |
| <b>A/D, D/A Converters</b>               | 24 bit, 192 kHz sample rate maximum. A/D converters on socketed, field-upgradeable daughter board  |
| <b>A/D Dynamic Range</b>                 | 114 dB, A-weighted bandwidth<br>110 dB, 20 Hz – 22 kHz bandwidth   |
| <b>D/A Dynamic Range</b>                 | 112 dB, A-weighted bandwidth<br>108 dB, 20 Hz–22 kHz bandwidth   |
| <b>Metering</b>                          | 76-segment (4 x 19), sunlight-viewable<br>selectable peak, VU, or peak (with or without peak hold) with VU ballistics, variable brightness |

## Analog Input

(all measurements at Fs 96 kHz, 24 bit unless noted)

|  |  |
|--|--|
| <b>Frequency Response</b>                  | Mic or Line: 10 Hz–40 kHz, +0.1, –0.5 dB (gain controls centered)  |
| <b>Equivalent Input Noise</b>              | Mic: –133 dBu max (–135 dBV), 50 ohm source, A-weighted filter<br>Mic: –131 dBu max (–133 dBV), 50 ohm source, 20 Hz–20 kHz BW flat filter, gain fully up<br>Mic: –130 dBu max (–132 dBV), 150 ohm source, A-weighted filter<br>Mic: –128 dBu max (–130 dBV), 150 ohm source, 20 Hz–20 kHz BW flat filter, gain fully up |
| <b>THD + Noise</b>                         | Mic: 0.004% max (1 kHz, 22 Hz–22 kHz BW, gain control down, –15 dBu input)<br>Line: 0.004% max (1 kHz, 22 Hz–22 kHz BW, gain control down, +16 dBu input)  |
| <b>Gain (input dBu to –20 dBFS)</b>        | Mic (normal gain mode): 25–70 dB<br>Mic (low gain mode): 10–55 dB<br>Line: –6–18 dB, 0.1 dB increments   |
| <b>Input Impedance</b>                     | Mic (XLR): 4k ohm<br>Line (XLR and TA3): 20k ohm   |
| <b>Input Clipping Level</b>                | Mic input: –5 dBu minimum (normal gain mode, gain control fully down)<br>Mic input: +10 dBu minimum (low gain mode, gain control fully down)<br>Line input: +26 dBu minimum (gain control fully down)  |
| <b>Input Topology</b>                      | Mic and Line: fully electronically balanced, RF, ESD, short, and overload protected; pin-2 hot, pin-3 cold   |
| <b>Gain Matching</b>                       | Line inputs: ±0.1 dB, channel-to-channel   |
| <b>Common Mode Rejection Ratio</b>         | Mic: 40 dB minimum at 80 Hz  |
| <b>High-Pass Filters</b>                   | 40, 80, 160, 240 Hz @ 12/18/24 dB/oct (all menu selectable)  |
| <b>Mic Powering (each XLR selectable):</b> | 48 V phantom through 6.8k resistors, 10 mA per mic available, menu-selected per channel in mic or line level positions   |
| <b>Mic Input Limiters</b>                  | analog (pre-A/D converter), dual-stage optocoupler and FET,<br>–4 dBFS threshold, 20:1 limiting ratio, 5 mS attack time, 200 mS release time   |

## Output Analog

|                                     |   |
|-------------------------------------|---|
| <b>Line Output Clipping Level</b>   | +20 dBu minimum, 10k ohm load   |
| <b>Attenuation &amp; Resolution</b> | 0–40 dB, 1 dB increments  |
| <b>Output Topology</b>              | Line: fully electronically-balanced, RF, ESD, short, and overload protected; pin-2 driven hot, pin-3 driven cold; let pin-3 float for unbalanced connections. |

## Inputs/Outputs – Digital

|                |   |
|----------------|---|
| <b>AES3-id</b> | 75 ohm, 0.5 V p-p, S/PDIF compatible with RCA adapter |
|----------------|---|

## Digital Storage

|                            |  |
|----------------------------|--|
| <b>Internal hard drive</b> | ATA-5 interface 1.8-in or 2.5-in hard drive 4200–7200 RPM supported, FAT32 formatted, up to 2 TB addressable                 |
| <b>Compact Flash</b>       | CF type I, II, and + (microdrive) compatible, FAT32 formatted, up to 2 TB addressable  |
| <b>File Types</b>          | WAV or BWF (AES-31 format), mono or polyphonic, at supported Fs, 24-bit or 16-bit MP3 @ 64, 96, 128, 240, or 320 kb/s stereo |
| <b>Utilities</b>           | Format, speed test, and repair utility for internal HD and CF volumes  |

## Data Transfer / Control

|                 |   |
|-----------------|---|
| <b>FireWire</b> | peripheral-mode, IEEE-1394a compliant, 6-pin FireWire, Windows 2000, XP, Mac OS X only  |
| <b>C. Link</b>  | 6-wire modular input and output, RS-232 machine control, word clock, time code transfer |

## Time Code

|                        |   |
|------------------------|---|
| <b>Modes Supported</b> | free run, record run, 24 hour run, continuous jam   |
| <b>Frame Rates</b>     | 23.976, 24, 25, 29.97DF, 29.97ND, 30DF, 30ND  |
| <b>Accuracy</b>        | <0.2 ppm, when tuned with Ambient Master Controller, holds TC clock for 8 hours after main battery removal (AA time code battery installed); after 8 hours, retains time of day |

## Powering

|                                 |   |
|---------------------------------|---|
| <b>Internal Voltages</b>        | ±16 VDC regulated audio rails<br>5 VDC data<br>3.3 VDC data<br>1.5 VDC DSP core<br>48 VDC phantom power   |
| <b>Power supply (batteries)</b> | operating cell, removable 7.2 V (nominal) Sony M- or L-type Li-ion, operational from 6–8 V, time code battery, 1.2 V AA nickel metal-hydride  |
| <b>Power supply (external)</b>  | 10–18 V, 1000 mA minimum, via locking 4-pin Hirose connector, use Hirose #HR10-7P-4P (DigiKey# HR100-ND) for locking mating DC connector; pin-1 (–), pin-2 (–), pin-3 (+), pin-4 (+). See <a href="#">Powering</a> section for additional details |

## Environmental

|                              |   |
|------------------------------|---|
| <b>Operation and Storage</b> | Ambient temperature 5–55° C,<br>Relative humidity (non-condensing) <80% |
|------------------------------|---|

## Other

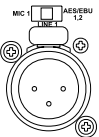
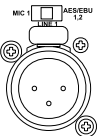
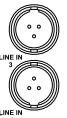
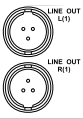



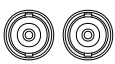
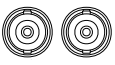
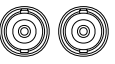

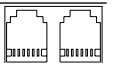

|                        |   |
|------------------------|---|
| <b>LCD Display</b>     | 202 x 32 pixels, extended temperature, backlit display                          |
| <b>Tone Oscillator</b> | 100 Hz–10 kHz, variable output, assigned to tracks or outputs (menu-selectable) |
| <b>Quick Setups</b>    | Four factory presets, one user setup stored to CF or HD as data file            |

## Dimensions and Weight

|             |   |
|-------------|---|
| <b>Size</b> | 45 mm x 209 mm x 125 mm (H x W x D)<br>1.8" x 8.2" x 4.9" |
| <b>Mass</b> | unpacked: 1.2 kg, (2.6 lbs) without battery               |

## Connector Pin Assignments

Each connector type, electrical characteristics, and pin assignment is shown below.

| Connector                           |   | Pin Assignments   | Notes  |
|-------------------------------------|---|---|--|
| <b>XLR<br/>(Analog Inputs)</b>      |    | 1 – ground<br>2 – signal (+)<br>3 – signal (-)  | 4000 ohm input impedance, mic level<br>20k ohm input impedance, line level<br>active-balanced  |
| <b>XLR<br/>(AES Inputs)</b>         |    | 1 – ground<br>2 – signal (+)<br>3 – signal (-)  | transformer-balanced, for use 110 ohm twisted-pair cabling, AES3 specification   |
| <b>TA3M<br/>Inputs</b>              |    | 1 – ground<br>2 – signal (+)<br>3 – signal (-)  | 20k ohm input impedance, line level<br>active-balanced. Mates with Switchcraft TA3F-type connector.  |
| <b>TA3M<br/>Master Output Bus</b>   |    | 1 – ground<br>2 – signal (+)<br>3 – signal (-)  | 120 ohm output impedance, active balanced.<br>For unbalanced connection, pin-1 ground, pin-2 hot, pin-3 not connected. Mates with Switchcraft TA3F-type connector. |
| <b>3.5 mm<br/>Master Output Bus</b> |   | tip – signal L<br>ring – signal R<br>sleeve – signal ground                             | Master Output Bus signal in an unbalanced, consumer-electronic level.  |
| <b>3.5 mm<br/>Headphone</b>         |  | tip – signal L<br>ring – signal R<br>sleeve – signal ground                             | mates with 3.5 mm TRS jack.  |
| <b>5-pin LEMO<br/>Time code</b>     |  | 1 – ground<br>2 – SMPTE In<br>3 – ASCII in/out<br>4 – tuning out<br>5 – time code out   | LEMO B-series connector  |
| <b>AES3id (S/PDIF) Inputs</b>       |  | center pin – signal<br>sleeve – ground  | BNC female, unbalanced, coaxial connection, 75 ohm connectors recommended  |
| <b>AES3id (S/PDIF) Outputs</b>      |  | center pin – signal<br>sleeve – ground  | BNC female, unbalanced, coaxial connection, 75 ohm connectors recommended  |
| <b>Word Clock Input and Output</b>  |  | center pin – signal<br>sleeve – ground  | BNC female, unbalanced, coaxial connection, 75 ohm connectors recommended  |
| <b>FireWire (-1394)</b>             |  | center pin – signal<br>sleeve – ground  | 6-pin male FireWire cable  |
| <b>C. Link In / Out</b>             |  | 1 – +3.3 V<br>2 – Tx (output)<br>3 – ground<br>4 – Rx (input)<br>5 – WC in<br>6 – TC in | Not a telephone jack!  |
| <b>Hirose 4-pin<br/>DC Input</b>    |  | 1 – ground<br>2 – ground, same as pin-1<br>3 – DC (+) charge<br>4 – DC (+) operate      |  |

## Power Consumption Variables

The 744T draws power from either its on-board Li-ion battery or from external DC sources. Two factors need to be considered to calculate battery runtime—battery/power supply capacity and unit power consumption. The best determination of your run time is to experiment with a given recording setup.

The 744T power consumption varies over a range between 4 W to 20 W, depending on active functions. The following functions have the most significant affect on power consumption:

|                            |   |
|----------------------------|---|
| <b>Inputs</b>              | Active analog inputs increase power consumption. If recording from digital sources, disable analog inputs, or inputs altogether to reduce power consumption. If recording solely to inputs 1 and 2, disable inputs 3 and 4 to reduce power consumption. Analog inputs and the microphone preamps draw current whether they are idle or active. Active inputs draw 1.5 W compared to deactivated inputs. |
| <b>Hard Drive Activity</b> | When the unit is recording to or playing back from the internal hard drive, power consumption raises by approximately 2 W.  |
| <b>Microphone Powering</b> | Phantom powered microphones draw power for operation. Up to 1 W can be drawn from the phantom supply.   |
| <b>Battery Chargers</b>    | Depending on the charge state of the on-board Li-ion and the internal AA time code battery, the charging circuit can draw ~10 W from external DC.   |
| <b>Sampling Rate</b>       | The 744T draws more power at higher sampling rates. Each doubling of the sampling rate adds ~1 W of power consumption.  |

## Recording Time Calculation

The calculation of available 744T recording time involves three factors:

- **track count** - how many concurrent audio tracks are selected for recording.
- **data rate** - calculated from the sample rate and bit depth for non-compressed audio and by bit rate for data compressed audio. Data rate determines how big the data “container” is for the audio signal (see the calculation below for determining PCM audio).
- **storage medium capacity** - typically expressed in GB

### Uncompressed Recording Time in Track-Hours

|     | Data Rate (bit depth/sample rate), one track |                        |                        |                        |                         |
|-----|--|------------------------|------------------------|------------------------|-------------------------|
|     | 16/44.1<br>(5.05 MB/min)                     | 16/48<br>(5.49 MB/min) | 24/48<br>(8.24 MB/min) | 24/96<br>(16.5 MB/min) | 24/192<br>(33.0 MB/min) |
| 1   | 3.30   | 3.03                   | 2.02                   | 1.01                   | 0.51                    |
| 2   | 6.60   | 6.07                   | 4.05                   | 2.02                   | 1.01                    |
| 4   | 13.2   | 12.1                   | 8.09                   | 4.05                   | 2.02                    |
| 8   | 26.4   | 24.3                   | 16.2                   | 8.09                   | 4.05                    |
| 15  | 49.5   | 45.5                   | 30.3                   | 15.2                   | 7.59                    |
| 40  | 132  | 121                    | 80.9                   | 40.5                   | 20.2                    |
| 60  | 198  | 182                    | 121                    | 60.7                   | 30.3                    |
| 100 | 330  | 303                    | 202                    | 101                    | 50.6                    |

The chart above shows recording time available with the 744T. Time is expressed in hours per track (track-hours) at the specified data rate supported by the 744T. If recording two tracks, divide the track hours figure by two. Similarly for four-track recording, divide track-hours by four. Note that



the 744T supports additional sample rate / bit depth combinations, however, only the most common are included below.

### Record Time

The chart shows that when recording 24-bit/48 kHz audio to a 40 GB hard drive the maximum amount of recording time available roughly 80 track-hours. If recording a stereo two-track file, this yields 40 stereo hours of record time.

*Note that most storage mediums now quote capacity in GB using SI units, where 1000 megabytes equals one gigabyte.*

### PCM Audio

Uncompressed digital audio is expressed numerically by two measurements, bit depth and sampling frequency, such as 16-bit/48 kHz. These two numbers are used to compute the data rate of uncompressed audio.

#### Audio Data Rate = Bit Depth x Sampling Frequency

In the example below the data rate of a single 16-bit/48 kHz audio stream is computed in megabytes per minute. Division by 1,048,576 converts from bits to megabits. Division by 8 converts from megabits to megabytes; multiply by 60 converts seconds to minutes.

$$(((16 \times 48000) / 1,048,576) / 8) \times 60 = 5.49 \text{ MB/min}$$

## MP3 Compressed Record Time in Hours

|                                   |     | MP3 Data Rate (bit depth/sample rate), stereo track |                          |                           |                           |                           |                           |                           |
|-----------------------------------|-----|---|--------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Storage in GB<br>(1000 MB = 1 GB) |     | 64 kb/s<br>(0.47 MB/min)                            | 96 kb/s<br>(0.70 MB/min) | 128 kb/s<br>(0.94 MB/min) | 160 kb/s<br>(1.17 MB/min) | 192 kb/s<br>(1.40 MB/min) | 256 kb/s<br>(1.86 MB/min) | 320 kb/s<br>(2.34 MB/min) |
|                                   | 1   | 35  | 23                       | 17                        | 14                        | 11                        | 8                         | 7                         |
|                                   | 2   | 71  | 47                       | 35                        | 28                        | 23                        | 17                        | 14                        |
|                                   | 4   | 142   | 94                       | 71                        | 56                        | 47                        | 35                        | 28                        |
|                                   | 8   | 284   | 189                      | 142                       | 113                       | 94                        | 71                        | 56                        |
|                                   | 15  | 533   | 355                      | 266                       | 213                       | 177                       | 133                       | 106                       |
|                                   | 40  | 1422  | 948                      | 711                       | 568                       | 474                       | 355                       | 284                       |
|                                   | 60  | 2133  | 1422                     | 1066                      | 853                       | 711                       | 533                       | 426                       |
|                                   | 100 | 3555  | 2370                     | 1777                      | 1422                      | 1185                      | 888                       | 711                       |

The chart above shows recording time available with the 744T when recording to an MP3 file. Time is expressed in hours at the specified MP3 supported by the 744T. Note that all recordings are two-channel recordings.

### Compressed Audio

When digital audio is compressed using some form of lossy, perceptual process such as MPEG2-Layer3 (MP3 audio), Windows Media encoding (WMA), ATRAC encoding (used in MiniDisc), AAC (MPEG-4 audio), or others - it can have a significant reduction in its data rate. Compressed audio has enabled the practical distribution of audio over low speed data networks.

# Accessories

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## Included Accessories

The accessories below are included with the 744T:

- Worldwide (100–240 VAC to 12 VDC, 24 W) mains power supply
- Li-ion removable rechargeable battery, 1500 mAh
- XL-RJ C. Link cable for unit-to-unit linking
- Padded man-bag

## Optional Accessories

The above accessories are just the start of building a flexible recording kit that can accommodate multiple types of connections. Available accessories from Sound Devices include:

- **XL-WPH**  
power adapter included with unit; 100–240 VAC input, 12 VDC output; it's good to have a spare
- **XL-B**  
removable, rechargeable, Li-ion battery; 1500 mAh battery; it's good to have several spare
- **CS-7**  
PortaBrace bag with shoulder strap, holds 744T and RM accessories; mounts onto CS-442 and CS-302 mixer bags
- **XL-1A (sold as pair)**  
TA3F to TA3F cable, used to connect the direct outputs of the a Sound Devices 442 mixer to the channel 3/4 analog line-level inputs
- **XL-2 (sold as pair)**  
TA3F to XLR-M cable, used for output connection from the master analog output
- **XL-2F (sold as pair)**  
XLR-F to TA3F cable, used for input connection to line inputs 3 and 4
- **XL-BNC**  
BNC to BNC cable, to connect word clock from external sources to the 744T for synchronizing the 744T; also used to sync external devices from the word clock of the 744T.
- **XL-LB**  
5-pin LEMO to BNC, used to jam video cameras from the 744T.
- **XL-LL**  
5-pin LEMO to 5-pin LEMO, used to connect the 744T time code circuit to Ambient time code sync boxes, slates, and controllers or to jam one 744T to another 744T; additionally used to jam Aaton cameras from the 744T
- **XL-LX**  
5-pin LEMO to XLR-M and XLR-F, used to connect the time code output to SMPTE time code inputs and outputs

## Menu Navigation Shortcuts

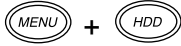
To speed navigation the 744T has numerous navigation “shortcuts”. The following is a complete list.



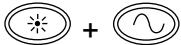
acts as an escape key and exits from most menus and functions immediately



drops all functions except file copy and begins recording



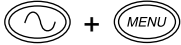
press simultaneously to enter the time code jam menu



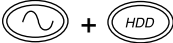
press backlight then tone to lock all front panel buttons except for Record, Stop and Play. FF and Rev are available in playback mode. Use backlight and tone again to unlock the panel.



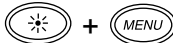
press repeatedly to cycle through input routing presets. Last preset will open the input routing menu to the custom route selection



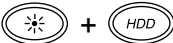
toggles input 1 phantom power



toggles input 2 phantom power



toggles input 1 high-pass



toggles input 2 high-pass

## Glossary of Terms

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### **daily folder**

a directory generated by the recorder each calendar day.

### **dither**

the process of adding noise to an audio signal to increase the accuracy of low-level signals when bit-reducing a digital bit stream. In general, dither should be engaged if reduction from 24 bit to 16 bit audio is needed.

### **LED**

(l)ight (e)mitting (d)iode. The 744T uses ultra-efficient GaN LEDs for all positions. LED brightness is fully variable.

### **play**

the state of the “transport”. The 744T is reading audio data from disk and sending to any output that has tracks selected.

### **play-pause**

when the stop/pause key is pressed while play is occurring the recorder goes into play-pause mode. This allow user to cue an audio file by holding down the ff and rew keys or to skip to the next or previous file by single pressing ff and rew.

### **play-stop**

when the stop/pause key is presses following play-pause.

### **plesiochronous**

pronounced plee-see-AH-krun-us (from the Greek plesos, meaning close; and chronos, meaning time) a term describing a condition where two or more signals are nearly synchronized. For example, a communication system of digital devices where the clocks between a transmitting and receiving device aren't locked directly to one another (as in a master and slave relationship), but are both highly accurate and are running at the “same” rate (same, meaning, in literal terms, “nearly” the same). There are standards governing the rate of deviation allowed before a system can be considered plesiochronous. Short of that it would be asynchronous. One real world example of a plesiochronous system might be two word clock generators that both are deriving their clock rate from a common black burst generator. We usually would think of this as a synchronous system (and it generally will work), but depending upon how accurate the two generators really are it could fall into the plesiochronous category. Similarly, two word clock generators running on their own would tend to be an asynchronous system, but could, if accurate enough, fall into the plesiochronous range.

### **track monitor**

post-record audio signal sent to output buses or headphones. Track monitor audio is program played from the hard drive after being written. Because all audio signal is routed through RAM buffers before writing to hard drive and/or Compact Flash, there is a substantial delay when monitoring track audio during recording.

## Warranty and Technical Support

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### Warranty & Service

Sound Devices, LLC warrants the 744T Portable Audio Recorder against defects in materials and workmanship for a period of ONE (1) year from date of original retail purchase. This is a non-transferable warranty that extends only to the original purchaser. Sound Devices, LLC will repair or replace the product at its discretion at no charge. Warranty claims due to severe service conditions will be addressed on an individual basis. THE WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE. SOUND DEVICES, LLC DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SOUND DEVICES, LLC IS NOT RESPONSIBLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM ANY BREACH OF WARRANTY OR UNDER ANY OTHER LEGAL THEORY. Because some jurisdictions do not permit the exclusion or limitations set forth above, they may not apply in all cases.

For all service, including warranty repair, please **contact Sound Devices for an RMA** (return merchandise authorization) before sending your unit in for repair. Product returned without an RMA number may experience delays in repair. When sending the unit for repair, please do not include accessories, including CF cards, batteries, power supplies, carry cases, cables, or adapters unless instructed by Sound Devices.

Sound Devices, LLC  
Service Repair RMA #XXXXX  
300 Wengel Drive  
Reedsburg, WI 53959 USA  
telephone: (608) 524-0625

### Technical Support / Bug Reports

For technical support and bug reporting on all Sound Devices products contact:

Sound Devices, LLC  
E-mail: [support@sounddevices.com](mailto:support@sounddevices.com)  
web: [www.sounddevices.com/contact\\_support.htm](http://www.sounddevices.com/contact_support.htm)  
Telephone: +1 (608) 524-0625 / Toll-Free in the U.S.A.: (800) 505-0625  
Fax: (608) 524-0655

Sound Devices cannot guarantee that a given computer, software, or operating system configuration can be used satisfactorily with the 744T based exclusively on the fact that it meets our minimum system requirements.

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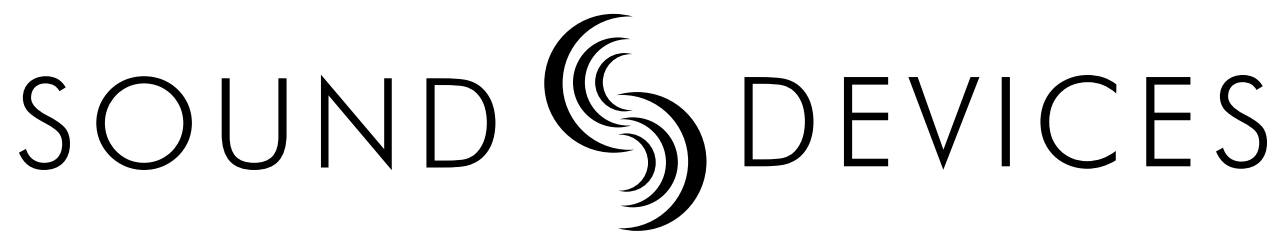
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### Governing Law

This agreement and limited warranty are governed by the laws of the state of Wisconsin.

[illegible]







## 744T Packing List

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Thank you for purchasing the 744T Portable High-Resolution Digital Audio Recorder. Please make certain that the package contains the listed items below.

- 1) **744T Digital Audio Recorder**
- 1) **Removeable Lithium Ion Battery**
- 1) **Carry Case**
- 1) **Power Supply AC, 100–240 VAC input, 12 VDC, 24 watt output**
- 1) **C. Link Cable for Multi-Unit Linking**
- 4) **Rubber Bumpers**
- 1) **Printed User Guide and Technical Documentation**
- 1) **Purchase Registration Card**
- 1) **Packing List (this sheet)**

## Firmware Version 1.15 – Known Issues

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### FireWire

- When connected to a Mac OS or Windows computer, the internal hard drive (only) appears as a volume. The CF volume does not appear on the computer in firmware version 1.15.
- The FireWire implementation is not fully speed-optimized. Transfer occurs at sub drive throughput rates

### MP3 Encoder

- The licensed MP3 encoder from Analog Devices sounds poor at all bit rates.

These known issues will be addressed in future revisions of firmware.