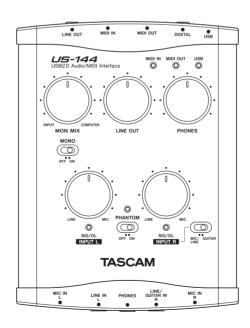


US-144

USB Audio/MIDI Interface

OWNER'S MANUAL



IMPORTANT SAFETY INSTRUCTIONS

For U.S.A.-

TO THE USER

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual. may cause harmful interference to radio communications.

However, there is no quarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- a) Reorient or relocate the receiving anten-
- b) Increase the separation between the equipment and receiver.
- c) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- d) Consult the dealer or an experienced radio/TV technician for help.

CAUTION

Changes or modifications to this equipment not expressly approved by TEAC CORPORATION for compliance could void the user's authority to operate this equipment.

Declaration of Conformity Model Number: Trade Name: TASCAM

Responsible party: TEAC AMERICA, INC. Montebello, California, U.S.A.

Telephone number: 1-323-726-0303

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received

including interference that cause undesired operation.

> This appliance has a serial number located on the rear panel. Please record the model number and serial number and retain them for your

records Model number Serial number

IMPORTANT SAFETY PRECAUTIONS

- 1 Read these instructions.
- 2 Keep these instructions.
- 3 Heed all warnings.
- 4 Follow all instructions.
- 5 Do not use this apparatus near water.
- 6 Clean only with dry cloth.
- 7 Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9 Only use attachments/accessories specified by the manufacturer.
- 10 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



- Do not expose this apparatus to drips or splashes.
- Do not place any objects filled with liquids, such as vases, on the apparatus.
- Do not install this apparatus in a confined space such as a book case or similar unit.

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- * Macintosh, Mac OS and Mac OS X are trademarks of Apple Inc., registered in the U.S. and other countries.
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1 - Introduction

Please read this owner's manual carefully before you begin using the US-144, and use the product correctly as directed in order to ensure long and trouble-free enjoyment of all its functionality.

After you have read this manual, keep it

nearby for reference when required.

We can accept no responsibility for any loss of the data you record using this product onto other MIDI equipment in your system or onto storage devices such as hard disk.

Overview

The US-144 is a USB-based audio interface designed for use with Digital Audio Workstation (DAW) software. It provides a four-input, four-output 24-bit 96 kHz audio interface and a 16-channel MIDI interface. Because the US-144 is USB-based, it is the ideal companion to any desktop- or laptop-based digital recording setup. And since

the US-144 operates using only USB power, you can use it with a laptop computer to create a very compact and portable digital audio workstation system.

The US-144 is also an ideal way to capture analog sources such as records or cassette tapes into your computer and preserve them as audio CDs.

Features

- 24-bit / 96 kHz audio interface.
- Analog input signals (L, R) and digital input signals (L, R) can be input at the same time and recorded simultaneously into your computer via USB.
- Two XLR mic/line inputs (balanced) and two 1/4" phone mic/line inputs (balanced/unbalanced) are provided. One of the 1/4" phone inputs can be switched to allow direct input of an electric guitar or electric bass (R channel only).
- Stereo digital input jack and stereo digital output jack.

- Unbalanced stereo line output (RCA connector) and headphone output.
- MIDLIN/OUT.
- Direct Monitor function allows zerolatency monitoring of the input.
- Power is supplied by the USB connector.

A note about computer operation

If you are unsure about how to perform basic computer operations appearing in this manual, please refer to the owner's manual that came with your computer.

What is in the package

The US-144 package contains the following items.

- · US-144 main unit
- · USB cable
- Owner's manual (this document)

- CD-ROM (containing drivers and manuals)
- DVD-ROM (Cubase LE4)
- · Cubase LE4 Quick Start Guide

1 - Introduction

Conventions used in this manual

The following conventions are used in this manual:

Front panel keys, knobs, and indicators, and rear panel connectors are designated in all-capital letters.

Example: LINE IN jacks

This typeface is used to designate messages displayed by the software.

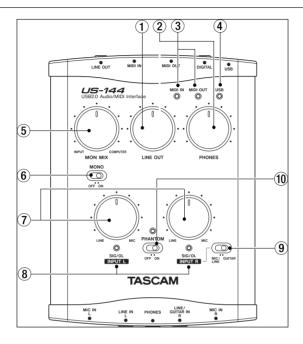
Example: Control Surface Protocol

This typeface is used to designate software menu functions and on-screen controllers.

Example: ASIO Device

2 - Parts of the US-144

Top panel



- 1 LINE OUT level knob Controls the output level of the LINE OUT jacks.
- **2 PHONES LEVEL knob** Controls the output level of the **PHONES** jack.
- **3 MIDI IN indicator** Lights when MIDI data is being received at the **MIDI IN** connector.

NOTE

A device that transmits the MIDI Active Sense message will cause this indicator to blink constantly. To stop the blinking, disable the use of MIDI Active Sense on the sending device, if possible.

3 MIDI OUT indicator Lights when MIDI data is being transmitted from the MIDI OUT connector.

- **USB indicator** Lights to indicate a valid USB connection to the host computer.
- (5) MON MIX balance knob Controls the balance of the signal sources being output from the LINE OUT jacks and the PHONES jack. When this knob is turned to the far left, the signal being input to the US-144 (from the XLR jacks, or 1/4" phone jacks) will be output. When this knob is turned to the far right, the output signal received from the computer via USB will be output.
- **6 MONO switch** Turn this switch **ON** if you want to monitor in monaural. This switch affects only the analog input signal.

2 - Parts of the US-144

- 7 INPUT knobs (L, R) Adjust the level of the audio signal being input to the MIC IN jacks and LINE IN jacks.
- (8) SIG/OL indicators Light when signals are being input to the input channels (L, R). They will light green to indicate a signal is present, and will light red immediately before distortion occurs. These indicators apply only to the analog inputs.

NOTE

These indicators will light green when the input signal level is in the range of -30 dBFS to -2 dBFS. The indicators will light red when the input signal level exceeds -2 dBFS.

MIC/LINE-GUITAR select switch Set this switch as appropriate for the input source you have connected to the LINE IN jack R channel. Use the GUITAR position if you have directly connected an electric guitar or electric bass. Use the **MIC/LINE** position if you have connected an electronic musical instrument, audio device, or mic.

(10) **PHANTOM switch** Turns on the +48V phantom power supplied to the **MIC IN** jacks.

WARNING

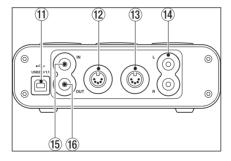
Microphones should not be connected to or disconnected from the US-144 with phantom power switched on. Unbalanced dynamic microphones should never be connected to phantompowered connectors.

NOTE

Turn this switch on only if you are using condenser microphones that require phantom power.

Please note that if you are operating the unit with a battery-powered laptop computer, the battery life of the computer will be reduced if the **PHANTOM** switch is on.

Rear panel



(1) USB connector Use a USB cable to connect this to the host computer's USB 2.0 port. The US-144 obtains power from the host computer via the USB cable. In rare cases, a computer's USB port may not be able to supply enough power to operate

the US-144. If this occurs, consider purchasing a USB 2.0 hub that comes with its own external power supply.

NOTE

If the US-144 is operating with a USB 1.1 (Full Speed) connection, only two chan-

2 - Parts of the US-144

nels of recording/playback will be available, and the sample rate choices will be limited to 44.1 kHz and 48 kHz. Use the control panel to select whether the analog or digital inputs will be used.

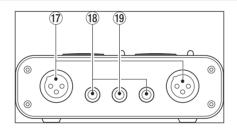
- (2) MIDI OUT connector Transmits MIDI messages.
- (3) MIDI IN connector Receives MIDI messages.
- **LINE OUT L/R jacks** (RCA connector, unbalanced) These are analog stereo output jacks.

- (b) **DIGITAL IN jack** This is an RCA connector that inputs a stereo S/PDIF digital signal.
- (b) **DIGITAL OUT jack** This is an RCA connector that outputs a stereo S/PDIF digital signal.

NOTE

The US-144's **DIGITAL IN/OUT** jacks allow simultaneous input and output at 24-bit/96 kHz.

Front panel



- (7) MIC IN (L, R) jacks (XLR balanced) These are analog mic input jacks. The wiring is as follows: pin 1 = ground, pin 2 = hot, pin 3 = cold.
- (18) LINE IN (L, R) jacks (TRS 1/4" phone jacks) These are balanced line input jacks. The R channel also accommodates guitar input. If the top panel MIC/LINE-GUITAR select switch is in the GUITAR position, the

R jack operates as an unbalanced input jack for guitar.

If the MIC/LINE-GUITAR select switch is in the MIC/LINE position, the R jack operates as a balanced input jack. (Sleeve = ground, tip = hot, ring = cold)

(9) PHONES jack (stereo 1/4" phone) This is a headphone output jack.

3 - Installation

System requirements

Windows

Supported operating system: 32-bit Windows XP SP2 and 32-bit

Windows Vista

Recommended system: Pentium or AMD Athlon 1 GHz or faster (or equivalent processor), 512 MB or more memory, USB 2.0 port

These requirements are for when using Cubase LE4. If you are using other application software, you will need to consult the operating requirements for the software you are using.

NOTE

The number of usable audio tracks will depend on the speed of your hard disk. The faster your hard disk, the better your results will be.

If the US-144 is operating with a USB 1.1 (Full Speed) connection, only two channels of recording/playback will be available.

We recommend that you have at least 512 MB of memory, but when using diaital audio application software, the more memory you have the happier you will be.

Although this product has been checked for use with typical computers that meet the above operating requirements, we cannot guarantee that it will operate with all computers that meet these requirements. Please be aware that even under the same conditions, processing capability may vary depending on differences of the design and system.

Mac OS X

- Macintosh computer with a USB 2.0 connector
- Mac OS X 10.3.9 & higher on PowerPC Mac systems

For Macintosh as well, the more memory you have and the faster your hard disk, the happier you will be when using digital audio application software

3 - Installation

Installing the drivers

In order to use the US-144, you must install the appropriate drivers into your computer. As described below, this is an easy process using the CD-ROM included with the US-144.

Drivers are updated from time to time. You can download the most recent version of the drivers from the TASCAM website http://www.tascam.com/>.

Do not connect the US-144 to your computer before you have installed the drivers.

CAUTION

Handle the enclosed CD-ROM with care. If the disc becomes scratched or dirty, your computer may be unable to read it and the software cannot be installed. If the disc becomes unreadable, a fee will be charged for its replacement.

WARNING

Never attempt to play the enclosed CD-ROM in a conventional audio CD player, as the resulting noise may damage your speakers or your hearing.

Installing the drivers for Windows

The US-144's drivers are provided on the CD-ROM as an executable installer entitled US-122L & US-144 driver x_yy.exe (x_yy is the version number.) Installation of the drivers requires that you run this installer before plugging in your US-144 for the first time. If you do happen to plug in your US-144 before running the installer, the Add New Hardware wizard will appear. In this case, simply unplug the US-144, cancel all the Add New Hardware wizard windows, and run TASCAM's driver installer

Installation procedure

- 1 Make sure that the US-144 is not connected to your computer.
- 2 Double-click the executable installation file US-122L & US-144 driver x_yy.exe. The installer will start up.
- 3 Select the desired language from the menu and click the OK button. A dialog box will appear.

4 Click the Install the Driver button and follow the instructions on the screen. The drivers will be installed.

NOTE

During driver installation, a warning that this software ... has not passed Windows Logo testing will appear. If this message appears, click Continue to proceed with the installation.

3 - Installation

Installing the drivers for Mac OS X

The US-144's drivers are provided on the CD-ROM as a package file entitled US-122L& US-144 driver x vy.mpkg. (x vv is the version number.) Simply doubleclick on this package file's icon to launch it and follow the directions that appear on vour screen.

Settings on your computer

Here are a few basic points to help you set up your computer for best performance with audio applications.

• Do not run other applications. You will probably use your computer for applications other than audio, but we recommend that you avoid running other applications at the same time you are running audio programs. Processing digital audio places a considerable load on your computer.

This means that if you are running other applications (especially graphics or Internet tools) at the same time as your audio application, the processing may not happen fast enough.

- Certain devices such as network cards or WinModems can cause conflicts with USB processing. If you experience such a conflict, you can use the Device *Manager* to temporarily disable the offending device.
- If your computer has an IDE hard disk, enabling Direct Memory Addressing (DMA) will improve performance. In Windows XP and Windows Vista, this is enabled by default.

4 - Control panel settings

Overview

The Control Panel lets you make various settings for the US-144's functionality. On Windows XP and Windows Vista, the US-122L & US-144 Control Panel shortcut can be found in the Windows Start menu in the Windows control panel and also under All Programs\TASCAM\US-122L & US-144.

On Mac OS X, the US-122L & US-144 Control Panel is located in the Applications folder. Other useful audio and MIDI settings for Mac OS X can be found in Applications/Utilities/Audio MIDI Setup.

The Control Panel is divided into the following two sections.

Status section

This shows the current status of the driver and the connected hardware.

You cannot edit the settings from this section.

Setting section

You can edit the various settings of the driver.

Driver settings

Audio Performance

The US-144 driver temporarily stores input and output audio samples in buffers. The size of these buffers can be adjusted. A smaller buffer size will reduce the delay when monitoring the audio signal, but will require your computer to perform the processing faster. If the processing does not occur in time (e.g., if other system operations are occurring), you may hear clicks, pops, or dropouts in the audio signal. A larger buffer size provides more safety against such problems caused by other system activities, but will produce greater delay when monitoring the audio signal. You select the buffer size that works best for your system.

On the Windows version of the US-144 Control Panel, the Audio Performance setting permits you adjust the buffer size that will be used by all audio applications. The Lowest Latency setting is the minimum buffer size, and the Highest Latency setting is the maximum buffer size.

On Mac OS X, the buffer size is determined by each audio application.
Consequently, there is no Audio
Performance setting on the Mac OS X version of the US-144 Control Panel. Some applications select the buffer size automatically while others permit the user to select the buffer size. Please consult your audio application's documentation for details.

4 - Control panel settings

Sample Clock Source

You can set the clock source to *Automatic* or *Internal*

Automatic (default): If a signal is being input to the **DIGITAL IN** jack, its clock will be used. If no signal is being input to the

DIGITAL IN jack, the US-144's internal clock will be used.

Internal: The US-144's internal clock will always be used.

Digital Output Format

This lets you choose either AES/EBU or S/PDIF as the digital output format.

Many professional devices use an XLR connector for AES/EBU. Special adapters may be purchased to convert between a digital audio RCA connector and digital audio XLR connector.

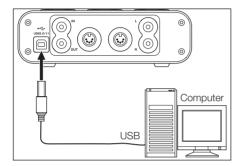
USB 1.1 Mode Input Selection

This item is shown only if the US-144 is connected to a USB 1.1 port on the host computer or to a USB 1.1 hub. In this case, the US-144 functions as a 2-in / 2-out audio device, rather than the usual 4-in / 4-out. You can choose either *Analog* or *Digital* as the input source.

5 - Connections

USB connections

Using the included cable, connect the US-144 to your computer as shown in the illustration



NOTE

Some USB devices access the USB bus frequently. To avoid dropouts and clicks in the audio signal, we strongly recommend that you do not connect other USB devices to the USB bus used by the US-144.

USB keyboards and mice are exceptions to this, and will probably not cause problems.

Audio connections

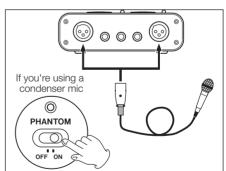
Connect the output signal of your mic, guitar, keyboard, or other audio device to the US-144, where it will be converted into digital audio and sent via USB to your computer. Connect the output of the US-144 to your speakers (via an amp) or headphones, so you will be able to monitor the audio signals coming into the US-144 or being produced by your computer.

NOTE

The US-144 has two input channels (L, R), with a MIC IN jack (XLR), LINE IN and LINE/GUITAR IN jack (1/4" phone jack) provided for each channel. Do not connect signals to both of these analog input jacks at the same time. If both are connected, the signal will not be correctly input to the US-144.

Mic

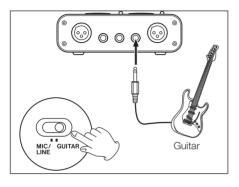
Connect your mics to the MIC IN (L, R) jacks (XLR). If you are using a condenser mic that requires phantom power, turn on the phantom power.



5 - Connections

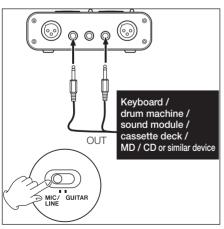
Guitar

Connect your guitar to the **R**-channel **LINE/ GUITAR IN** jack (1/4" phone jack) and set the **MIC/LINE-GUITAR** switch to **GUITAR**.



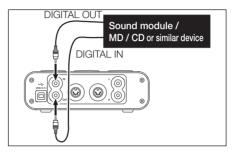
Keyboard / drum machine / sound module / cassette deck / MD / CD etc. (analog connection)

Connect the analog audio output of these devices to the LINE IN L or LINE/GUITAR IN R jacks (1/4" phone jack). If you use the R-channel, set the MIC/LINE-GUITAR switch to MIC/LINE.



Sound module / MD / CD etc. (digital connection)

Connect the digital audio output of these devices to the **DIGITAL IN** jack.

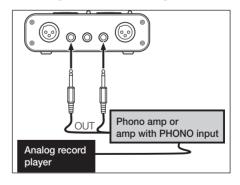


NOTE

The US-144's digital input jack is an RCA connector

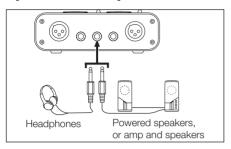
Analog record player

The output of an analog record player cannot be connected directly to the US-144. You must connect a phono amp between your analog record player and the US-144. (Alternatively, you can connect it via an audio amp that has **PHONO** inputs.)



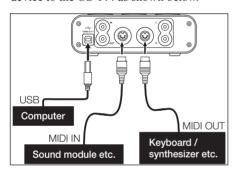
5 - Connections

Speakers/headphones

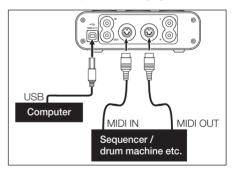


MIDI connections

Connect your sound module, keyboard/ synthesizer, drum machine, or other MIDI device to the US-144 as shown below.



You can use the MIDI IN/MIDI OUT connectors to transmit and receive MTC (MIDI Time Code). This allows the MTC-compatible DAW (Digital Audio Workstation) computer application to synchronize with your MIDI equipment.



6 – MIDI Implementation Chart

Function		Transmitted	Received	Remarks
Basic Channel	At power ON	X	Χ	Through
	Changed	X	Χ	
Mode	At power ON	X	Χ	Through
	Messages	X	X	
	Altered	********		
Note		X	X	Through
Number	Range	*******		
Velocity	Note ON	X	X	Through
	Note OFF	X	X	
After Touch	Polyphonic	X	X	Through
	Channel	X	X	
Pitch Bender		X	Χ	Through
Control Change		X	Χ	Through
Program Change		X	Χ	Through
	Range #	********		
System Exclusive		X	Χ	Through
System Common	:Song Pos	X	X	Through
	:Song Sel	X	X	
	:Tune	X	Χ	
System	:Clock	X	Χ	Through
Real Time	:Commands	X	Χ	
Other	:Local on/off	X	Χ	Through
	:All note off	X	X	
	:Active sensing	X	X	
	:Reset	X	X	
Notes			<u> </u>	

Mode 1: Omni on, PolyMode 2: Omni on, MonoO:YesMode 3: Omni off, PolyMode 4: Omni off, MonoX:No

Audio specifications

Nominal	input levels	
	MIC IN L and R (XLR balanced)	-58 dBu (TRIM =max) to −14 dBu (TRIM =min)
	LINE IN L and LINE/GUITAR IN R in MIC/LINE position (1/4" jack, balanced)	-40 dBu (TRIM =max) to +4 dBu (TRIM =min)
	LINE/GUITAR IN R in GUITAR position (1/4" jack, unbalanced)	-51 dBu (TRIM =max) to −7 dBu (TRIM =min)
Maximun	n input levels	
	MIC L and R (XLR balanced)	+2 dBu (TRIM =min)
	LINE IN L and LINE/GUITAR IN R in MIC/LINE position (1/4" jack, balanced)	+20 dBu (TRIM =min)
	LINE/GUITAR IN R in GUITAR position (1/4" jack, unbalanced)	+9 dBu (TRIM =min)
Input imp	pedance	
	MIC IN L and R (XLR balanced)	2.4 kΩ
	LINE IN L and LINE/GUITAR IN R in MIC/LINE position (1/4" jack, balanced)	10 kΩ
	LINE/GUITAR IN R in GUITAR position (1/4" jack, unbalanced)	1 ΜΩ
Nominal	output level	
	LINE OUT (RCA unbalanced)	-10 dBV
Maximun	n output level	
	LINE OUT (RCA unbalanced)	+6 dBV
Output in	npedance	
	LINE OUT (RCA unbalanced)	100 Ω
Maximun	n output power	
	PHONES (1/4" stereo jack)	14 mW + 14 mW (32 Ω)

Audio performance

Signal-to	o-noise ratio	
	LINE IN (through ADC and DAC) to LINE OUT	> 96 dB (A-weighted, $\textbf{TRIM}\text{=}\text{min.,}$ input impedance at 40 $\Omega)$
	LINE IN (through direct monitor) to LINE OUT	$>$ 100 dB (A-weighted, $\textbf{TRIM}\text{=}\text{min., input}$ impedance 40 $\Omega)$
Total harmonic distortion (THD+N, 22 Hz to 22 kHz)		
	LINE IN (through ADC and DAC) to LINE OUT	< 0.006% (1 kHz sine +20 dBu input, TRIM =min.)
	LINE IN (through direct monitor) to LINE OUT	< 0.004% (1 kHz sine +20 dBu input, TRIM=min.)

Other characteristics

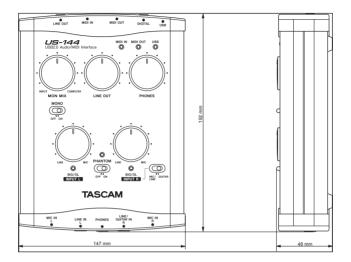
_			
Digital audio			
A/D Conversion (AK5381)	24-bit/96 kHz		
D/A Conversion (AK4384)	24-bit/96 kHz		
Digital IN			
Connector	RCA pin jack		
Signal format	IEC60958 Consumer (S/PDIF)		
Level	0.5Vpp/75Ω		
Digital OUT * The digital output is not used with Windows Media player			
Connector	RCA pin jack		
Signal format	Selectable in the Control Panel between IEC60958 Consumer (S/PDIF) and IEC958 Professional (AES/EBU)		
Level	$0.5 \text{Vpp}/75\Omega$		
MIDI			
MIDI IN and MIDI OUT ports (DIN 5-pin)	Conform to MIDI standards		

USB			
USB port (down stream connector)		USB 2.0 Format	
Host computer compatibility			
On a setting a secretaria	Windows	32-bit Windows XP SP2 or 32-bit Windows Vista	
Operating system	Macintosh	Mac OS 10.3.9 or later	
Communication		USB 2.0	
Audio/MIDI interface protocols	Windows	WDM(KS), ASIO/ASIO2 and GSIF2	
	Macintosh	Core Audio, MIDI interface (OS X)	
Bundled software		Cubase LE4 (for Windows or Macintosh)	

Physical characteristics

Dimensions			
	External dimensions (w x h x d)	147 x 192 x 48 mm	
	Weight	1 Kg	
Power			
	Supplied via USB	5V, maximum current 500 mA	

Dimensions



Notes

TASCAM

US-144

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