





# OWNER'S MANUAL ADDENDUM VERSION 1.7 UPDATE

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# 1. Introduction

This document describes the new features available in TT24 software upgrade version 1.7.

New Features Summary

- Full Input/Output Routing via TT Control Software.
- Front of House / Monitor Linked Consoles with a single DS3232 Digital Snake.
- Support for the optional LP48 card that offers complex Loudspeaker Processing and Insert EQ Processing.

The details of the LP48 card are not shown in this document. Please see the LP48 card user's guide, available from our website: www.mackie.com.

# 2. Full I/O Routing

A full routing matrix has been added to allow complete input and output routing to and from the input and output channels, as well as direct output routing and hardware I/O patching. This includes analog and digital inputs and outputs. In addition, you can route U-Net signals in and out of the console and between two U100 cards in a single console. These functions are only accessed via the TT Control software. Routing changes cannot be done from the control surface except by loading presets or snapshots.

The routing screens allow things such as ADAT input routing to input channels on bank 1 or Aux Output Routing to the AES output. In addition it allows detailed routing of the signals from each card slot, doing away with the basic bank-based routing used for the DS3232 prior to software version 1.7.

The routing screen is accessible from the central drop-down menu in the TT control PC application. Choose one of the four new Routing options:

- Routing Input
- Routing Output
- Routing U-Net Card A In / Card B Out
- Routing U-Net Card B In / Card A Out

📲 tt control v1.70 F	ULIMASTER										
	CH.1	Analog		LI	NK	Inp	ut R	outing		Menu	Files
las.		INPUT CHANNEL		SIGN	AL SC	Övervie	w		1		4
	•	Analog 1 «				Equalize			2		
		Analog 2 «	Hardware	Input	Mic	CatelEx	ander		4		
		Analog 3 «	Hardware	Input	Mic	Compres	ssor		5		
		Analog 4 «	Hardware	Input	Mic	Group/A	NDC .		6		
		Analog 5 «	Hardware	Input	Mic	Aux Mar	ster		7		
		Analog 6 «	Hardware	Input	Mic	Snapsho	xts		8		
		Analog 7 «	Hardware	Input	Mic	RFX Matrix			9		
		Analog 8 «	Hardware	Input	Mic	T Part De	- the state				
		Analog 9 «	Hardware	Input	Mic	Routing	- Outruit		w		
		Analog 10 «	Hardware	Input	Mic	Routing	- U-Net Car	d A In / Card B O	ut E		
		Analog 11 «	Hardware	Input	Mic	Routing	- U-Net Car	d A Out / Card B )	In R		
		Analog 12 «	Hardware	Input	Mic	Utility - I	Monitor Sou	ce .	Fi		
		Analog 13 «	Hardware	Input	Mic	UtiRy-1	Stereo Inpu		F2		
		Analog 14 «	Hardware	Input	Mic	Ubley -	Meterina		E4		
	-	Analog 15 «	Hardware	Input	Mic	Utilly -	Test Tones		F5		
		Analog 16 «	Hardware	Input	Mic	Ublity -I	User Bank		F6		
		Analog 17 «	Hardware	Input	Mic	Setup -	Operation		F7		
		Analog 18 «	Hardware	Input	Mic	Setup -	General		F8		
		Analog 19 «	Hardware	Input	Mic	Setup -	MIDI		F10		
		Analog 20 «	Hardware	Input	Mic	Setup -	Expansion		F11		
		Analog 21 《	Hardware	Input	Mic	Setup -	Naming		F12		
		Analog 22 «	Hardware	Input	Mic	Setup -	Linking				
		Analog 23 «	Hardware	Input	Mic	96 Fade	rs		Ctri+F		
		Analog 24 «	Hardware	Input	Mic	Meters Matrix C	handana		Ctri+M Chi+0		
		Digital 25 «	Hardware	Input	AL	The second	and the second		Carro		
		Digital 26 «	Hardware	Input	AL.	Console	19006				
		Digital 27 «	Hardware	Input	AD/	AT	3	+ ×			
		Digital 28 «	Hardware	Input	AD	AT	4	+ ×			
	9	Digital 29 «	Hardware	Input	AD	AT	5	- H H -			•
-		Digital 20 //	Hardwara	Innut	AD	AT	6				0

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The Input and Output routing screens are similar, and are comprised of a source and destination list; the destinations are listed vertically on the left column followed by rows of drop down lists to their right allowing source selection. Assign a source by selecting items from the drop down lists from left to right This process is described in more detail in the routing sections below.

SA	X 1			INK	Inpu	it Re	outir	ng	
	INPUT CHANNEL	L	SIG	NAL S	OURCE				[
•	SAX 1	1	Hardware Input	Mic	c/Line	1	+ 🐮		Θ
	Analog 2	*	Hardware Input	Mic	:/Line	2	+ ×		
	Analog 3	*	Hardware Input	Mic	c/Line	3	+ ×		
	Analog 4	*	Hardware Input	Mic	c/Line	4	+ ×		
	Analog 5	*	Hardware Input	Mic	c/Line	5	+ ×		

Hovering over a row will highlight the row, making navigation around the list easier. There are more destinations than can fit on the screen at once, so the list can be scrolled vertically using the scroll bar along the right side or using the mouse wheel.

Additionally, each routing row has two buttons to the right side, Clear Routing (X) and Increment Routing (+):

- Clear Routing This clears the routing assignment for that row. It can be dragged up or down to clear the routing on adjacent rows.
- Increment Routing When dragged up or down, this will set the next or previous row to the incrementally next or previous assignment, allowing you to set consecutive assignments with ease.

NOTE: If the computer CTRL key is held while dragging, the rows will be filled with the same source signal giving you a fast way to assign the same signal to multiple channels or outputs.

Unassigned source rows will be shown as pale red dashes to indicate they are not currently in use. Once assigned, source rows are color coded to differentiate the main source type selected. These are described for input and output routing in the sections below.

U-Net Card Slot routing screens are slightly different. They still use the same sourcedestination method except that both the source and destination are selectable U-Net signals. This is described in detail in U-Net Routing section on page 28.

### Using a single TT24 and a DS3232 Digital Snake

If you have a single TT24 console and a DS3232 digital snake, then you need only be concerned with the Input and Output Routing described below. There is generally no need to look into the U-Net Card A In / Card B Out, and U-Net Card B In / Card A Out routing, unless you are linking multiple consoles. Even then, there are factory presets that will cover most typical systems.

# **Routing Presets**

The following sections on Input Routing, Output Routing, and U-Net Routing are shown in some detail, with screenshots thrown in from all directions.

To make it easier for you, we have created routing presets that cover typical applications. You may find that the presets do all that you need, so you do not have to fret over the details.

Routing Presets are stored on the console and can be loaded from the console but not saved. They can be both saved and loaded from the TT Control software. This is because routing changes can only be made from the control software. In the TT Control software, routing presets are saved and loaded from the File menu as usual.

These presets are available in four types from the TT Control FILES dropdown menu, and from the console's routing setup screen:

- Global All Routing: Presets that affect all routing (Input, Output, and U-Net)
- Input Routing: Presets that affect the Input Routing •
- Output Routing: Presets that affect the Output Routing •
- U-Net Routing: Presets that affect the U-Net Routing

You can also save your own presets using TT Control, and then recall these from the console as needed.



TT24 Console Setup Screen

Press "Routing" to bring up the Routing Setup

CUSTOM ROUTING AVAILABLE THRU TT CONTROL LOAD PRESET ALL ROUTING INPUT ROUTING	•	ROUTING	▲	SETUP	FILES					
ALL ROUTING	CUSTOM ROUTING AVAILABLE THRU TT CONTROL									
		LOAD	PRE	SET						
		ALL ROUTING		INPUT ROUTING	3					
		OUTPUT ROUTING		U-NET ROUTING	G					

TT24 Console Routing Setup Screen

Press these to bring up a list of available presets for each one.

### Mackie TT24 Digital Live Console Owner's Manual Addendum v1.7

Preset	Description
Default	Default input, output, and U-Net routing
Snake A Analog	DS3232 connected to a U100 in card slot A, routed to the Analog bank
Snake A Digital	DS3232 connected to a U100 in card slot A, routed to the Digital bank
Snake B Analog	DS3232 connected to a U100 in card slot B, routed to the Analog bank
Snake B Digital	DS3232 connected to a U100 in card slot B, routed to the Digital bank
MON Snake LP48	DS3232 connected to a U100 in card slot B, routed to the Analog bank and to FOH via a second U100 in card slot A. Aux sends are routed back to the snake. Configure console as MON Master on setup>linking screen.
FOH Snake LP48	FOH console linked to MON via a U100 in card slot A. DS3232 is routed to the Analog bank through the monitor console. An LP48 in card slot B is routed back to the snake along with Main and Group outputs. Configure console as FOH Master on setup>linking screen.

### Factory Global All Routing Presets

### Factory Input Routing Presets

Preset	Description
Default	Default input routing
ADAT B1 Mic B2	ADAT inputs routed to Analog bank and Mic inputs routed to Digital bank
Mic B1 B2	Mic inputs routed to Analog and Digital banks for independant control of FOH and monitor mixes from a single console
ADAT B1 B2	ADAT inputs routed to Analog and Digital banks for independant control of FOH and monitor mixes from a single console

### Factory Output Routing Presets

Preset	Description
Default	Default output routing. Group outputs 1-8 to rear panel Group/Matrix outputs.
Default Matrix	Default output routing. Matrix outputs A-H to rear panel Group/Matrix outputs.
Default LP48 A	Default output routing. LP48 in card slot A, speaker processor outputs 1-8 to rear panel Group/Matrix outputs.
Default LP48 B	Default output routing. LP48 in card slot B, speaker processor outputs 1-8 to rear panel Group/Matrix outputs.
Pre DSP ADAT Out	ADAT outputs routed from the Pre DSP channel signal
ADAT In to Out	ADAT inputs routed directly to the ADAT outputs for recording
Aux on Group XLR	Aux 1-8 routed to the rear panel Group/Matrix XLR outputs for easy connection to an analog snake

# 2.1 Input Routing

The Input Routing screen shows a routing list displaying Destination Input Channels down the left column. Choose Hardware Inputs or Card Slot signals to be routed to one or more input channels.

🦹 tt control v1.70 FOH MASTER									_ 🗆 🗙
	SA	X 1		LINK	Inp	ut Re	outing	Menu	Files
		INPUT CHANNEL		SIGNAL	OURCE				
		SAX 1	Hardware In	nput Mi	c/Line	1	+ 🕷 💌		9
		Analog 2 «	Hardware In	nput 🛛 Mi	c/Line	2	+ ×		
		Analog 3 «	Hardware In	nput Mi	c/Line	3	+ ×		
		Analog 4 «	Hardware In	nput Mi	c/Line	4	+ ×		
		Analog 5 «	Hardware In	nput Mi	c/Line	5	+ ×		
		Analog 6 «	Hardware In	nput Mi	c/Line	6	+ ×		
		Analog 7 «	Hardware In	nput Mi	c/Line		+ ×		
		Analog 8 «	Hardware In	nput Mi	c/Line	8	+ ×		
		Analog 9 «	Hardware In	iput Mi	c/Line	9	Ť Ă		
		Analog 10 «	Hardware In	iput Mi	c/Line	11			
		Analog 12 «	Hardware In	nput Mi	c/Line	12	+ ×		
		Analog 13 «	Hardware In	nput Mi	c/Line	13	+ ×		
		Analog 14 «	Hardware In	nput Mi	c/Line	14	+ ×		
9	9	Analog 15 «	Hardware In	nput Mi	c/Line	15	+ ×		۲
		Analog 16 «	Hardware In	nput Mi	c/Line	16	+ ×		
		Analog 17 «	Hardware In	nput Mi	c/Line	17	+ ×		
		Analog 18 «	Hardware In	nput Mi	c/Line	18	+ ×		
		Analog 19 «	Hardware In	nput Mi	c/Line	19	+ ×		
		Analog 20 «	Hardware In	nput Mi	c/Line	20	+ ×		
		Analog 21 «	Hardware In	nput Mi	c/Line	21	+ ×		
		Analog 22 «	Hardware In	nput Mi	c/Line	22	+ ×		
		Analog 23 «	Hardware In	nput Mi	c/Line	23	+ ×		
		Analog 24 «	Hardware In	nput Mi	c/Line	24	+ ×		
		Digital 25 «	Hardware In	nput	Line	1	+ ×		
		Digital 26 «	Hardware In	iput	Line	2	+ ×		
		Digital 27 «	Hardware In		Line	3	+ *		
٩	9	Digital 20 «	Hardware In	iput	ine	4			9
	-	Digital 20 //	Hardware In	iput	ino	5			
Destination Input	t Ch	annels 📕	Î		1	1			
Choose a Hardwa	re I	nput or a Card	Slot —						
Choose from avai	labl	e input types							
Choose from avai	labl	e channels —							
Increment Routin	ng (	+)					_		
Clear Routing (X)	) _								
Scroll up or down	1 <b>—</b>								

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The vertical list along the left shows input channels which will be listed by their default name and custom name (if assigned). Double clicking a channel will allow you to edit the channel custom name. These names are in a single column with the following contents:

Destination Input Channels	Notes
Analog 1-24	Full DSP when assigned to Analog Bank
Digital 25-48	Full DSP when assigned to Digital Bank or when UFXII installed
Line In 1-8	EQ Only
Card 1-8	Full DSP

### **Input Routing Table**

Signal Sources		
Drop Down 1	Drop Down 2	Drop Down 3
Hardware Input	Mic/Line	1-24
	ADAT	1-24 (44.1 or 48k)
		1-12 (88.2 or 96k)
	Line	1-8
	AES/SPDIF (one will be shown depending on the selection in setup>digital)	L-R
	Таре	A L-R, B L-R
	Talkback	In
Card Slot	A - Card Type (e.g. U100)	1-32 (note LP48 shows additional detail, see below)
	B - Card Type (e.g. U100)	1-32 (note LP48 shows additional detail, see below)

Each Source Row is color coded according to the selection made in the Drop Down 1 source type:

- Hardware Input Pale Blue (a very-faintly blue-tint of white)
- Card Slot Pale Yellow

For each destination input you can select the source to be either a Hardware Input or a Card Slot:

INPUT CHANNEL	CHANNEL Source					
Analog 1 - SAX 1		Hardware Input		1	+ .	
Analog 2	((	Card Slot		2	+ 8	
Analog 3	(C	Hardware Input	Mic/Line	3	+ N	
Analog 4	-00	Hardware Input	Mic/Line	4	+ N	۲
Analog 5	**	Hardware Input	Mic/Line	5	1 4 2	
Analog 6	((	Hardware Input	Mic/Line	6	+ 8	
Analog 7	u	Hardware Input	Mic/Line	7		

Choose from Hardware Input or Card Slot

For the Hardware Input, you can choose the source type:

INPUT CHANNEL	SIG	Туре			
Analog 1 - SAX 1 «	Hardware Input	Mic/Line	1		1
Analog 2 «	Hardware Input	ADAT	2	- + x	
Analog 3 «	Hardware Input	Line	з	+ ×	
Analog 4 «	Hardware Input	SPDIF	4	1+ 4	
Analog 5 «	Hardware Input	Tape	5	- + H	
Analog 6 «	Hardware Input	Talkback	6	+ *	
A short an 21 At	and it should be a state of the state of the	A VIEW IN DRAWN IN			

Choose from Mic/Line, ADAT, Line, SPDIF, Tape, or Talkback

and choose from the "Instance" or available channels from that source type:

AL SOURCE Instance Mic/Line 1 Mic/Line 2 Mic/Line 3 Mic/Line 4 Mic/Line 5	ADAT 1 ADAT 1 Mic/Line 2 Mic/Line 3 Mic/Line 4 Mic/Line 5	AL SOURCE Instance SPDIF L Mic/Line R Mic/Line 3 + *	SPDIF has L, R choices. (Shows AES if configured.)
Mic/Line 6 Mic/Line 7 Mic/Line 8 Mic/Line 9 Mic/Line 10 Mic/Line 11 Mic/Line 12	Mic/Line 6 Mic/Line 7 Mic/Line 8 Mic/Line 9 Mic/Line 10 Mic/Line 11 Mic/Line 12	AL SOURCE Instance Talkback In Mic/Line 2 + x	Talkback has IN only
Mic/Line 13 Mic/Line 14 Mic/Line 15 Mic/Line 16 Mic/Line 17 Mic/Line 18 Mic/Line 19	Mic/Line 13 Mic/Line 14 Mic/Line 15 Mic/Line 16 Mic/Line 17 Mic/Line 18 Mic/Line 19	AL SOURCE Instance Tape A L Mic/Line B L Mic/Line B R Mic/Line S R	Tape has A L, A R, B L and B R choices
Mic/Line 20 Mic/Line 21 Mic/Line 22 Mic/Line 23 Mic/Line 24	Mic/Line 20 Mic/Line 21 Mic/Line 22 Mic/Line 23 Mic/Line 24		

Mic/Line has 1 to 24 choices

ADAT has 1 to 12 choices at 88.2 or 96k, and 1-24 at 44.1 or 48k

For the Card Slot, you can select from the installed cards:

INPUT CHANNES	L-	SIG	Туре				
Analog 1 - SAX	1 %	Card Slot	A - UNet				
Analog 2	- KC	Hardware Input	B - LP48	2	+	x	
Analog 3	80	Hardware Input	Mic/Line	3	+	8	
Analog 4		Hardware Input	Mic/Line	4	+	×	
Analog 5	90	Hardware Input	Mic/Line	5	1 <b>+</b>	x	

Choose from UNet card or, in this example, an LP48 card

For the UNet Card Slot, you can choose from 1 to 32:

INPUT CHANNEL	SIG	Instance	-	
Analog 1 SAX 1 (c)	Card Slot	A - UNet	1	
Analog 2 《	Hardware Input	Mic/Line	2	
Analog 3 «	Hardware Input	Mic/Line	3	2
Analog 4 «	Hardware Input	Mic/Line	4	
Analog 5 «	Hardware Input	Mic/Line	5	
Analog 6 «	Hardware Input	Mic/Line	6	
Analog 7 《	Hardware Input	Mic/Line	7	
Analog 8 «	Hardware Input	Mic/Line	8	
Analog 9 «	Hardware Input	Mic/Line	9	
Analog 10 «	Hardware Input	Mic/Line	10	
Analog 11 «	Hardware Input	Mic/Line	11	
Analog 12 «	Hardware Input	Mic/Line	12	
Analog 13 《	Hardware Input	Mic/Line	13	
Analog 14 «	Hardware Input	Mic/Line	14	
Analog 15 «	Hardware Input	Mic/Line	15	
Analog 16 «	Hardware Input	Mic/Line	16	
Analog 17 «	Hardware Input	Mic/Line	17	
Analog 18 «	Hardware Input	Mic/Line	18	
Analog 19 «	Hardware Input	Mic/Line	19	
Analog 20 «	Hardware Input	Mic/Line	20	
Analog 21 «	Hardware Input	Mic/Line	21	
Analog 22 «	Hardware Input	Mic/Line	22	
Analog 23 «	Hardware Input	Mic/Line	23	
Analog 24 «	Hardware Input	Mic/Line	24	
Digital 25 《	Hardware Input	Line	25	
Digital 26 «	Hardware Input	Line	26	
Digital 27 «	Hardware Input	Line	27	
Digital 28 «	Hardware Input	Line	28	
Digital 29 «	Hardware Input	Line	29	
Digital 20 #	Hardwara Innut	11000	30	
			31	
			32	

Choose from Instances 1 to 32

The following section describes the options if you choose the LP48 card. If you don't have one, skip the next two pages.

## LP48 Card Routing

INPUT CHANNEL		SIG	NAL SOURCE	Instance
Analog 1		Card Slot	B - LP48	1 - Insert 1
Analog 2		Hardware Input	Mic/Line	2 - Insert 2
Analog 3	<b>((</b>	Hardware Input	Mic/Line	3 - Insert 3
Analog 4	<b>((</b>	Hardware Input	Mic/Line	4 - Insert 4
Analog 5	*	Hardware Input	Mic/Line	5 - Insert 5
Analog 6		Hardware Input	Mic/Line	6
Analog 7	((	Hardware Input	Mic/Line	7
Analog 8	"	Hardware Input	Mic/Line	8
Analog 9	w.	Hardware Input	Mic/Line	9 - Spkr 1
Analog 10	<b>((</b>	Hardware Input	Mic/Line	10 - Spkr 2
Analog 11	**	Hardware Input	Mic/Line	11 - Spkr 3
Analog 12	-	Hardware Input	Mic/Line	12 - Spkr 4
Analog 13	((	Hardware Input	Mic/Line	13
Analog 14	"	Hardware Input	Mic/Line	14
Analog 15	<b>%</b>	Hardware Input	Mic/Line	15
Analog 16	<b>((</b>	Hardware Input	Mic/Line	16
Analog 17	*	Hardware Input	Mic/Line	17 - Insert 6
Analog 18	**	Hardware Input	Mic/Line	18 - Insert 7
Analog 19	<b>((</b>	Hardware Input	Mic/Line	19 - Insert 8
Analog 20	<b>«</b>	Hardware Input	Mic/Line	20 - Insert 9
Analog 21	w.	Hardware Input	Mic/Line	21 - Insert 10
Analog 22	<b>((</b>	Hardware Input	Mic/Line	22
Analog 23	*	Hardware Input	Mic/Line	23
Analog 24		Hardware Input	Mic/Line	24
Digital 25	(C)	Hardware Input	Line	25 - Spkr 5
Digital 26	*	Hardware Input	Line	26 - Spkr 6
Digital 27	<b>((</b>	Hardware Input	Line	27 - Spkr 7
Digital 28	<b>((</b>	Hardware Input	Line	28 - Spkr 8
Digital 29	**	Hardware Input	Line	29
Digital 20	11	Hardware loput	Lina	30
				31
				32

If you choose the LP48 card as the source, then the available Instances to choose from will depend on the configuration of the LP48 card.

The LP48 card has three different modes of operation:

10 Insert EQs

4 x 8 Loudspeaker Processor

5 Insert EQs and 2 x 4 Loudspeaker Processor (This is a split mode of the above two modes.)

### Insert EQs

In Insert EQ mode, the signals assigned to the LP48 card go into the card, are EQ'd and return to the insert point only. They are not available for any other routing. The output from the LP48 card shows greyed-out labels for the inserts.

### Loudspeaker Processors

In Loudspeaker Processor mode, there will either be 4 outputs (in LP48 split mode) or 8 outputs (in  $4 \times 8$  mode).

The available outputs from the Loudspeaker Processor are the outputs from each crossover, such as a low, high for a two-way crossover, low, mid, and high for a three-way, and a low, low-mid, high-mid, and high for a four way crossover.

These can be routed to any input channel, or to any physical output,



#### Changing the mode of the LP48 Card

To change the mode of the LP48 card use the Expansion menu, or press F11:

Analog			кIn	put Routing	
INPUT CHANNEL		SIGN	AL SC OVE	rview	1
Analog 1	«	Card Slot	B - Equ	alizer	2
Analog 2	u	Hardware Input	Mic Dyn	amics	3
Analog 2		Hardware Input	Gat Mile Car	e/Expander	4
Analog 3	~	Hardware Input	Mile Gro	ipressor up/Aux	6
Analog 4		Hardware Input	INIC		-
Analog 5	**	Hardware Input	MIC AU	: Master ochobs	/ 8
Analog 6	*	Hardware Input	MIC EFX	pintes	9
Analog 7	*	Hardware Input	Mic Mat	rix	0
Analog 8	**	Hardware Input	Mic	élon - Tonyé	<u>^</u>
Analog 9	~	Hardware Input	Mic Rou	ting - Output	Ŵ
Analog 10	**	Hardware Input	Mic Rou	ting - U-Net Card A In / Card B Out	ε
Analog 11	**	Hardware Input	Mic Rou	ting - U-Net Card A Out / Card B In	R
Analog 12	**	Hardware Input	Mic ua	ty - Monitor Source	F1
Analog 13	"	Hardware Input	Mic Util	ty - Stereo Input	F2
Analog 14	-	Hardware Input	Mic	ty - Talkback	F3
Analog 15	a	Hardware Input	Mic ust	ty - Metering	P4 P5
Analog 16	u	Hardware Input	Mic Us	ty - User Bank	F6
Analog 17	u	Hardware Input	Mic set	n - Operation	F7
Analog 18	"	Hardware Input	Mile Seb	up - General	FB
Analog 10		Hardware Input	Mic Seb	up - Digital	P9
Analog 19		Hardware Input	Seb	up - MIDI	F10
Analog 20	**	Hardware Input	MIC Seb	up - Expansion	F11
Analog 21	*	Hardware Input	MIC Set	up - Naming up - Linking	P12
Analog 22	*	Hardware Input	Mic	ap - Lineny	
Analog 23	*	Hardware Input	Mic 961	aders	Ctrl+F
Analog 24		Hardware Input	Mic Ma	ers rix Overview	Ctrl+0
Digital 25	«	Hardware Input		- less de	-
Digital 26	**	Hardware Input	Con	sole mode	,
Digital 27	**	Hardware Input	Line	3 + ×	
Digital 28	**	Hardware Input	Line	4 + ×	
Digital 29	**	Hardware Input	Line	5 + × 🤜	۲
Disting 20		Hardwara Input	Line		



## 2.2 Output Routing

The Output Routing screen shows a routing list displaying Destination Hardware Outputs down in the left column. Choose from the Channel Outputs, Hardware Inputs, or Card Slot signals to be routed to one or more hardware outputs.

tt control v1.7.0 FOH MV				Dutput	Routing *	Menu	Files
	HARDWARE OUTPUT	Source		URCE	rtouting	inconta	1 1100
9 9	Aux 1 4	Channel Output		UNGE	Pre DSP +		9
	Aux 2	Hardware Input			Pre DSP + x		
	Aux 3	Card Slot			Pre DSP + H		
ŧ	Aux 4	Channel Output	Aux	4	Post Fader + ×		
Ē.	Aux 5	Channel Output	Aux	5	Post Fader = #	-	
6	Aux 6 帐	Channel Output	Aux	6	Post Fader + 🗷		
1	Aux 7 帐	Channel Output	Aux	7	Post Fader + 18		
0	Aux 8	Channel Output	Aux	8	Post Fader + 🗷		
	Aux 9 (	Channel Output	Aux	9	Post Fader 🛨 🖂		
	Aux 10 《	Channel Output	Aux	10	Post Fader 🛨 📧		
8	Aux 11 《	Channel Output	Aux	11	Post Fader H K		
6	Aux 12 (	Channel Output	Aux	12	Post Fader + =		
	Group/Matrix 1 «				I Back Patron I I I		
9	Group/Matrix 2 «	Channel Output	Group	2	Post Fader + R		
	Group/Matrix 3 @	Channel Output	Group		Post Fader +		
8	Group/Matrix 5	Channel Output	Group	5	Post Fader + +		
	Group/Matrix 6 4	Channel Output	Group	6	Post Fader + #		
	Group/Matrix 7 4	Channel Output	Group	7	Post Fader + K		
	Group/Matrix 8 @	Channel Output	Group	8	Post Fader + ×		
	Main L (	Channel Output	Main	L	Post Fader + ×		
	Main R (	Channel Output	Main	R	Post Fader 🖶 🖂		
	Main C «	Channel Output	Main	M	Post Fader 😑 🖂		
	Monitor L @	Channel Output	Monitor				
	Monitor R 4	Channel Output	Monitor	R	+ x		
	Tape A L 《	Channel Output	Main	l C	Pre DSP + B		
	Tape A R (	Channel Output	Main	R	Pre DSP + ×		
9	AES/SPDIFL «	Channel Output	Main		Pre DSP + ×		
	AES/SPDIF R (	Channel Output	Main Ch Rank	R	Pre DSP +		E,
Destination O Choose a Chai Input or Card	utput Channels nnel Output, Harc Slot	lware	Î				
Choose from a	available signal typ	bes —					
Choose from a	available channels						
Choose from H	Pre or Post option	S					
Increment Ro	uting (+)						
Clear Routing	(X)						
Scroll up or do	own						

The vertical list along the left shows hardware outputs. These names appear in a single column with the following contents:

Destination Hardware Outputs	Notes
Aux 1-12	
Group/Matrix 1-8	
Main L, R, C	
Monitor L, R, C	
Tape A L, R	
AES/SPDIF L, R	
ADAT 1-24	
Card A – Card Name 1-32	The card name is replaced with the name of the card in the slot if one is present
Card B – Card Name 1-32	The card name is replaced with the name of the card in the slot if one is present

Choose sources for each output by selecting an item from each of four drop down lists:

Signal Sources			
Drop Down 1	Drop Down 2	Drop Down 3	Drop Down 4
Channel Output	Main	L, R, C (or M)	Pre DSP, Post Fader
	Aux	1-12	Pre DSP, Post Fader
	Group	1-8	Post Fader
	Matrix	A-H	Pre Delay, Post Delay
	Monitor	L-R	
	Ch Bank 1	1-24	Pre DSP, Pre Fader
	Ch Bank 2	25-48	Pre DSP, Pre Fader
	Ch Line	1-8	Pre DSP, Pre Fader
	Ch FX	1 L-4 R	Pre Fader
	Ch Card	1-8	Pre DSP, Pre Fader
Hardware Input	Mic/Line	1-24	-
	ADAT	1-24 (44.1 or 48k)	1-12 if sample rate is 88.2 or 96k
	Line	1-8	-
	AES/SPDIF	L-R	AES or SPDIF, whichever is installed
	Таре	A L-R, B L-R	-
	Talkback	In	
Card Slot	A - Card Type (e.g. U100)	1-32 (note LP48 shows additional detail, see below)	-
	B - Card Type (e.g. U100)	1-32 (note LP48 shows additional detail, see below)	-

Each source row is faintly color-coded according to the selection made in the Drop Down 1 source type:

- Channel Output Pale Blue-ish white
- Hardware Input Pale Orange
- Card Slot Pale Yellow

## **Output Routing Examples**

For each destination output, you can select the source to be either a Channel Output, Hardware Input, or a Card Slot.

IFR.								
H.1 Analog			LINK	LINK Output Routing				
HARDWARE OUTPUT		Source		URCE				
Aux 1		Channel Output		L	Pre DSP +			
Aux 2	**	Hardware Input		L.	Pre DSP + ×			
Aux 3	**	Card Slot		L	Pre DSPI + ×			
Aux 4	~~	Channel Output	Aux	4	Post Fader + ×			
Aux 5		Channel Output	Aux	5	Post Fader + ×			
Aux 6		Channel Output	Aux	6	Post Fader + ×			

Choose from Channel Output, Hardware Input or Card Slot

### **Channel Outputs**

STER				
H.1 Analog			tpu	t Routing 🗂
HARDWARE OUTPUT		Туре		
Aux 1	Channel Output	Main	-	Pre DSP + 🛎 🔼
Aux 2	Channel Output	Aux		Pre DSP + ×
Aux 3	Channel Output	Group		Pre DSP + ×
Aux 4	Channel Output	Matrix	4	Post Fader + ×
Aux 5	Channel Output	Monitor	5	Post Fader + ×
Aux 6	Channel Output	Ch Bank 1	Б	Post Fader + ×
Aux 7	Channel Output	Ch Bank 2	7	Post Fader + ×
Aux 8	Channel Output	Ch Line	в	Post Fader + ×
Aux 9	Channel Output	Ch FX	Þ	Post Fader + ×
Aux 10	Channel Output	Ch Card	0	Post Fader + ×
Aug 11	// Channel Output	Auv	11	Boet Ender A R

If you choose a Channel Output, you can select from the following Types:

Choose from Main, Aux, Group, Matrix, Monitor, Ch Bank 1, Ch Bank 2, Ch Line, Ch FX, and Ch Card. Each of these has other options, shown on the next few pages of this guide.

### **Channel Outputs: Main**

If you choose Main from the channel output options, you can select from L, R or M, and each can be Pre DSP or Post Fader:

STER									Choose Main
:H.1	Analog			LINK	Οι	utput	Routin	g	
HA	RDWARE OUTPU	π	<u>^</u>	Ty	/pe				
	Aux 1		Channel Output	Main		-	Pre DSP	+ 📕 🔼	
	Aux 2		Channel Output	Aux		-	Pre DSP	+ ×	
	Aux 3	~~	Channel Output	Group		_	Pre DSP	+ x 🦳	
	Aux 4	((	Channel Output	Matrix		4	Post Fader	+ x	
	Aux 5		Channel Output	Monito	or	5	Post Fader	+ ×	
	Aux 6	~~	Channel Output	Ch Ba	nk 1	6	Post Fader	+ ×	
	Aux 7	«	Channel Output	Ch Ba	nk 2	7	Post Fader	+ ×	
	Aux 8		Channel Output	Ch Lin	e	В	Post Fader	+ ×	
	Aux 9	~~	Channel Output	Ch FX		Ð	Post Fader	+ ×	
	Aux 10	«	Channel Output	Ch Ca	rd	0	Post Fader	+ ×	
	Aux 11	11	Channel Output	A 115		44	Post Eader		
TER									Choose I R
H.1	Analog			LINK	Ou	tput	Routin		C)*
HAI	RDWARE OUTPUT			SIGNAL	80	Instan	-		0)
	Aux 1	«	Channel Output	Main		motant			
	Aux 2	*	Channel Output	Main	R		DSP		
	Aux 3	«	Channel Output	Main	E M		DSP	- x	
	Aux 4	"	Channel Output	Aux	=	4	Post Fader		
	Aux 5	"	Channel Output	Aux		5	Post Fader		
STER									Choose Pre D
H.1	Analog			LINK	Οι	utput	Routin	q 🖌 🗌	Fader
HA	RDWARE OUTPU	т		SIGNAL	. sour	RCE			
	Aux 1	~~			_		Node		
	Aux 2	~~~	Channel Output	Mair		L	Pre DSP		
	Aux 3	((	Channel Output	Mair		L	Post Fade	r 📄	
	Aux 4	~~	Channel Output	Aux		4	Post Fader	+ ×	
							In case of the local division of the local d		

Choose L, R, and M (or L, R, C)\*

Choose Pre DSP or Post Fader

\* Instead of L, R, and M, it could be L, R, and C depending upon the setting in the Operations menu:



### Channel Outputs: Aux

TER							
H.1 Analog			LINK	Dutput	: Ro	uting	
HARDWARE OUTPU	т		SIGNAL SO	DURCE			
Aux 1	~~	Channel Output	Main	Insta	nce	DSP + ×	
Aux 2		Channel Output	Aux	1			
Aux 3	**	Channel Output	Main	2		DSP + ×	
Aux 4	**	Channel Output	Aux	3		Fader + ×	
Aux 5	**	Channel Output	Aux	4		Fader + ×	
Aux 6	**	Channel Output	Aux	5		Fader + ×	
Aux 7	**	Channel Output	Aux	6		Fader + ×	
Aux 8	**	Channel Output	Aux	7		Fader + ×	
Aux 9	**	Channel Output	Aux	8		Fader + ×	
Aux 10	**	Channel Output	Aux	9		Fader + ×	
Aux 11	**	Channel Output	Aux	10		Fader + ×	
Aux 12	**	Channel Output	Aux	11		Fader + ×	
Group/Matrix 1	<b>«</b>			12			
Group/Matrix 2	2 «	Channel Output	Group	2	Post	Fader + ×	
Group/Matrix 3	3 «	Channel Output	Group	3	Post	Fader + ×	
Group/Matrix 4	1 11	Channel Output	Group	4	Post	Fader + ×	

Aux: Choices 1 to 12, and each can be Pre DSP or Post Fader:



### **Channel Outputs: Group**

TER					
H.1 Analog				Dutput R	outing
HARDWARE OUTPU	т		SIGNAL SC	OURCE	
Aux 1	*	Channel Output	Main	_ L _ P	re DSP + × 🔽
Aux 2	*	Channel Output	Aux	Instance	DSP + ×
Aux 3		Channel Output	Group	1	
Aux 4	*	Channel Output	Main	2	DSP + ×
Aux 5	*	Channel Output	Main	3	DSP + ×
Aux 6	*	Channel Output	Aux	4	Fader + ×
Aux 7	*	Channel Output	Aux	5	Fader + ×
Aux 8	*	Channel Output	Aux	6	Fader + ×
Aux 9	*	Channel Output	Aux	7	Fader + ×
Aux 10	*	Channel Output	Aux	8	Fader + ×
Aux 11	«	Channel Output	Aux	11 Pc	ost Fader + ×

Group: Choices 1 to 8, Post Fader. Note that these Group options will be greyed-out if Matrix is enabled in the console.

### **Channel Outputs: Matrix**

5	IER									
	H.1 Analog				outp	ut Ro	butir	١Ç	J	
	HARDWARE OUTPUT	Т		SIGNAL SO	URCE					
1	Aux 1	<b>«</b>	Channel Output	Ch Bank 1	1	Pre	e DSP	+	×	
	Aux 2	<b>«</b>	Channel Output	Aux	2	Pos	t Fader	+	×	
	Aux 3	<b>«</b>	Channel Output	Main	L	Pre	e DSP	+	×	
	Aux 4	<b>«</b>	Channel Output	Main	Ins	tance	DSP	+	×	
	Aux 5		Channel Output	Matrix	A					
	Aux 6	<b>«</b>	Channel Output	Aux	в		Fader	+	×	
	Aux 7	<b>«</b>	Channel Output	Aux	С		Fader	+	×	
	Aux 8	<b>«</b>	Channel Output	Aux	D		Fader	+	×	
	Aux 9	*	Channel Output	Aux	E		Fader	+	×	
	Aux 10	<b>«</b>	Channel Output	Aux	F		Fader	+	×	
	Aux 11	<b>«</b>	Channel Output	Aux	G		Fader	+	×	
	Aux 12	*	Channel Output	Aux	н		Fader	+	×	
	Group/Matrix 1	u	Channel Output	Matrix	Δ	Pre	Delay	+	×	

Matrix: Choices A to H, and each can be Pre Delay or Post Delay: Note that these Matrix options will be greyed-out if Group is enabled in the console.



Note: The Group/Matrix hardware outputs are changed automatically when enabling or disabling the matrix if they are set to the defaults. If they have been changed to a custom configuration, they will not be changed as the matrix is enabled or disabled.

### Channel Outputs: Monitor

1								
	H.1	Analog			Dutput	Ro	uting "	
İ	HA	RDWARE OUTPUT		SIGNAL SC	URCE			
		Aux 1	Channel Output	Main	L	Pre	DSP + ×	
		Aux 2	Channel Output	Aux	1	Pre	DSP + ×	
		Aux 3	Channel Output	Group	1	Post	Fader + ×	
		Aux 4	Channel Output	Group	1	Post	Fader + ×	
		Aux 5	Channel Output	Monitor	Instan	ice		
			Channel Output	Monitor	L			
		Aux 7	Channel Output	Aux	R		Fader + ×	
1		Aug 8	// Channel Output	Ause	8	Doet	Ender 1 V	

### Channel Outputs: Channel Bank 1

1 Analog			LINK C	output	Ro	outing *	
HARDWARE OUTPUT			SIGNAL SO	URCE			
Aux 1	ŧť.	Channel Output	Main	L	Pre	DSP	7
Aux 2	ŧ¢.	Channel Output	Aux	1	Pre	DSP + IN	
Aux 3	46	Channel Output	Group	1	Pos	t Fader = 📧	
Aux 4	СĘ.	Channel Output	Group		Post	t Fader + 📧	ľ
Aux 5	45	Channel Output	Group	2	Post	t Fader + =	f
Aux 6	80	Channel Output	Group	Instan	ce	Fader + ×	I
Aux 7		Channel Output	Ch Bank 1	1			I
Aux 8	ec.	Channel Output	Aux	2		Fader + ×	
Aux 9	60	Channel Output	Aux	3		Fader + ×	
Aux 10	er.	Channel Output	Aux	4		Fader =	
Aux 11	60	Channel Output	Aux	5		Fader + ×	
Aux 12	45	Channel Output	Aux	6		Fader + =	
Group/Matrix 1	00	Channel Output	Group	7		Fader + =	
Group/Matrix 2	60	Channel Output	Group	8		Fader + ×	
Group/Matrix 3	RC .	Channel Output	Group	9		Fader + III	
Group/Matrix 4	45	Channel Output	Group	10		Fader + K	
Group/Matrix 5	40	Channel Output	Group	11		Fader + =	
Group/Matrix 6	40	Channel Output	Group	12		Fader + H	
Group/Matrix 7	40	Channel Output	Group	13		Fader + ×	
Group/Matrix 8	- K	Channel Output	Group	14		Fader + H	
Main L	46	Channel Output	Main	15		Fader + ×	
Main R	¢ć,	Channel Output	Main	16		Fader	
Main C	46	Channel Output	Main	17		Fader	
Monitor L	ŧť.	Channel Output	Monitor	18		+ 14	
Monitor R	96	Channel Output	Monitor	19		+ K	
Tape A L	40	Channel Output	Main	20		DSP = =	
Tape A R	СÇ.	Channel Output	Main	21		DSP =	
AES/SPDIF L	ec.	Channel Output	Main	22		DSP	
AES/SPDIF R	86	Channel Output	Main	23		DSPIELE	C
ADAT 1	10	Channel Output	Ch Bank 4	24		indor a la	

Monitor: Choices L and R

Channel Bank 1: Choices 1 to 24. Each can be Pre DSP or Pre Fader:



### Channel Outputs: Channel Bank 2

R	_		l l		
I.1 Analog				output Ro	outing 🔪
HARDWARE OUTPL	л		SIGNAL SO	URCE	
Aux 1	00	Channel Output	Main	L Pr	e DSPI + ×
Aux 2	**	Channel Output	Aux	Instance	DSP = ×
Aux 3	*	Channel Output	Ch Bank 2	25	
Aux 4		Channel Output	Group	26	Fader + ×
Aux 5	~~	Channel Output	Group	27	Fader + ×
Aux 6	-95	Channel Output	Group	28	Fader + ×
Aux 7	**	Channel Output	Group	29	Fader + ×
Aux 8	-93	Channel Output	Group	30	Fader + ×
Aux 9		Channel Output	Group	31	Fader + ×
Aux 10	**	Channel Output	Aux	32	Fader + ×
Aux 11	-93	Channel Output	Aux	33	Fader + ×
Aux 12		Channel Output	Aux	34	Fader + ×
Group/Matrix	1 ĸ	Channel Output	Group	35	Fader + ×
Group/Matrix 2	2 «	Channel Output	Group	36	Fader + ×
Group/Matrix	3 (C	Channel Output	Group	37	Fader + ×
Group/Matrix	4 «	Channel Output	Group	38	Fader + ×
Group/Matrix	5 «	Channel Output	Group	39	Fader + ×
Group/Matrix	6 «	Channel Output	Group	40	Fader + ×
Group/Matrix	7 - «	Channel Output	Group	41	Fader + ×
Group/Matrix	8 🗰	Channel Output	Group	42	Fader + ×
Main L	**	Channel Output	Main	43	Fader + ×
Main R	-93	Channel Output	Main	44	Fader + ×
Main C	00	Channel Output	Main	45	Fader + ×
Monitor L	**	Channel Output	Monitor	46	+ ×
Monitor R	**	Channel Output	Monitor	47	+ ×
Tape A L		Channel Output	Main	48	DSP + ×
Tape A R		Channel Output	Main	R Pr	e DSP + ×
AES/SPDIE L	-05	Channel Output	Main	Pr	e DSP + ×

### Channel Bank 2: Choices 25 to 48. Each can be Pre DSP or Pre Fader:



### Channel Outputs: Channel Line

H.1 Ana	alog		LINK	Dutput	Routing *
HARDWAR	E OUTPUT	-	SIGNAL SC	DURCE	
Au	к1 «	Channel Output	Main	L	Pre DSP + × 🔼
Au	x2 «	Channel Output	Aux	1	Pre DSP + ×
Au	x3 «	Channel Output	Aux	2	Pre DSP + ×
Au	κ4 «	Channel Output	Aux	3	Pre DSP + ×
Au	<5 ≪	Channel Output	Aux	4	Pre DSP + ×
Au	(6 ((	Channel Output	Aux	Instan	ce DSP + ×
Au		Channel Output	Ch Line	1	
Au	x8 «	Channel Output	Aux	2	DSP + ×
Au	к9 «	Channel Output	Aux	3	DSP + ×
Aux	:10 «	Channel Output	Aux	4	DSP + ×
Aux	:11 «	Channel Output	Aux	5	DSP + ×
Aux	12 «	Channel Output	Aux	6	DSP + ×
Group/M	Aatrix 1 «	Channel Output	Aux	7	DSP + ×
Group/M	Matrix 2 «	Channel Output	Group	8	Fader + ×
Group/M	Aatrix 3 «	Channel Output	Group	3	Post Fader + ×

Channel Outputs: Channel FX

TER								
H.1	Analog			LINK	Output	Ro	uting	
HA	RDWARE OUTPUT			SIGNAL	SOURCE			
	Aux 1	≪	Channel Output	Main		Pre	DSP +	
	Aux 2	**	Channel Output	Aux	1	Pre	DSP +	×
	Aux 3	-{{	Channel Output	Aux	2	Pre	DSP +	*
	Aux 4	**	Channel Output	Aux	3	Pre	DSP +	×
	Aux 5	-{{	Channel Output	Aux	Instan	се	DSP +	×
			Channel Output	Ch FX	1 L			
	Aux 7	К	Channel Output	Aux	1 R		DSP +	×
	Aux 8	ж	Channel Output	Aux	2 L		DSP +	×
	Aux 9		Channel Output	Aux	2 R		DSP 🗉	×
	Aux 10	Ж	Channel Output	Aux	3 L		DSP +	×
	Aux 11		Channel Output	Aux	3 R		DSP 🗄	×
	Aux 12	**	Channel Output	Aux	4 L		DSP 🗉	×
G	roup/Matrix 1		Channel Output	Aux	4 R		DSP +	×
G	roup/Matrix 2	«	Channel Output	Group	2	Post	Fader +	x

Channel Line: Choices 1 to 8. Each can be Pre DSP or Pre Fader:



Channel FX: Choices 1 L, 1 R, 2 L, 2 R, 3 L, 3 R, and 4 L, and 4 R. Each is Pre Fader.

### Channel Outputs: Channel Card

TER								
H.1	Analog			LINK	Dutput	Ro	uting `	1
HA	RDWARE OUTPUT			SIGNAL SO	OURCE			
	Aux 1	-	Channel Output	Main		Pre	DSP + ×	
	Aux 2	00	Channel Output	Aux	1	Pre	DSP + ×	
	Aux 3	٠	Channel Output	Aux	2	Pre	DSP + ×	
	Aux 4		Channel Output	Aux	3	Pre	DSP + ×	
	Aux 5	**	Channel Output	Aux	Instar	ice	DSP 🗄 🗷	
			Channel Output	Ch Card	1			
	Aux 7	00	Channel Output	Aux	2		DSP ± ±	
	Aux 8	-	Channel Output	Aux	3		DSP = x	
	Aux 9	-95	Channel Output	Aux	4		DSP + ×	
	Aux 10	**	Channel Output	Aux	5		DSP + ×	
	Aux 11	-	Channel Output	Aux	6		DSP + ×	
	Aux 12	66	Channel Output	Aux	7		DSP 🗄 🗉	
G	roup/Matrix 1	"	Channel Output	Aux	8		DSP + ×	
G	roup/Matrix 2	Ж	Channel Output	Group	2	Post	Fader + ×	

Channel Card: Choices 1 to 8. Each can be Pre DSP or Pre Fader:



## Hardware Input

If you choose a Hardware Input instead of a Channel Output:

HARDWARE OUTPUT	20		Туре					
Aux 1	W.	Hardware Input	Mic/Line	-				
Aux 2		Channel Output	ADAT	2	Post Fader	+	×	
Aux 3		Channel Output	Line	3	Post Fader	÷	×	
Aux 4		Channel Output	SPDIF	4	Post Fader	÷	×	
Aux 5		Channel Output	Tape	5	Post Fader	Ŧ	×	
Aux 6	45	Channel Output	Talkback	6	Post Fader	÷	×	
Aux 7	ж	Channel Output	Aux	7	Post Fader	÷	×	
Aux 8		Channel Output	Aux	8	Post Fader	+	36	
Aux 9	33	Channel Output	Aux	9	Post Fader	÷	×	
Aux 10		Channel Output	Aux	10	Post Fader	÷	×	
Aux 11		Channel Output	Aux	11	Post Fader	H	R	
Aux 12	45	Channel Output	Aux	12	Post Fader	+	×	
Group/Matrix 1		Channel Output	Group	1	Post Fader	÷	ж	
Group/Matrix 2	- ((	Channel Output	Group	2	Post Fader	+	×	
Group/Matrix 3	33	Channel Output	Group	3	Post Fader	٠	×	
Group/Matrix 4		Channel Output	Group	4	Post Fader	÷	×	
Group/Matrix 5		Channel Output	Matrix	5	Pre Delay	÷	R	
Group/Matrix 6	45	Channel Output	Matrix	6	Pre Delay	÷	×	
Group/Matrix 7		Channel Output	Matrix	7	Pre Delay	÷	ж	
Group/Matrix 8	**	Channel Output	Matrix	8	Pre Delay	+	×	
Main L	33	Channel Output	Main	L	Post Fader	٠	ж	
Main R		Channel Output	Main	R	Post Fader	÷	×	
Main C		Channel Output	Main	M	Post Fader	÷	R	
Monitor L	45	Channel Output	Monitor	L		÷	×	
Monitor R	. ((	Channel Output	Monitor	R		÷	ж	
Tape A L		Channel Output	Main	L	Pre DSP	+	×	
Tape A R		Channel Output	Main	R	Pre DSP	٠	×	
AES/SPDIF L		Channel Output	Main	L	Pre DSP	÷	×	
AES/SPDIF R		Channel Output	Main	R	Pre DSP	H	×	
								and the second se

Hardware Input: Choices are Mic/Line, ADAT, Line, SPDIF, Tape, and Talkback.

Each has its own menus, and these are described in the next few pages:

### Hardware Input: Mic/Line

	-			and much Da	
1.1 Analog			LINK	utput Ro	outing
HARDWARE OUTPUT			SIGNAL SC	Instance	
		Hardware Input	Mic/Line	1	
Aux 2	≪	Channel Output	Aux	2	DSP + ×
Aux 3	ĸ	Channel Output	Aux	3	DSP 🗉 🗉
Aux 4	-66	Channel Output	Aux	4	DSP + ×
Aux 5	((	Channel Output	Aux	5	DSP = ×
Aux 6	≪	Channel Output	Ch Card	6	DSP + ×
Aux 7	"	Channel Output	Aux	7	DSP 🕂 🗉
Aux 8	-K	Channel Output	Aux	8	DSP + ×
Aux 9	ĸ	Channel Output	Aux	9	DSP ± ×
Aux 10	-K	Channel Output	Aux	10	DSP + ×
Aux 11	ĸ	Channel Output	Aux	11	DSP + ×
Aux 12	ĸ	Channel Output	Aux	12	DSP 🗄 🗵
Group/Matrix 1	ĸ	Channel Output	Aux	13	DSP + ×
Group/Matrix 2	-K	Channel Output	Group	14	Fader + ×
Group/Matrix 3	ĸ	Channel Output	Group	15	Fader + ×
Group/Matrix 4	(C	Channel Output	Group	16	Fader + ×
Group/Matrix 5	ĸ	Channel Output	Group	17	Fader + ×
Group/Matrix 6	ĸ	Channel Output	Group	18	Fader + ×
Group/Matrix 7	ĸ	Channel Output	Group	19	Fader + ×
Group/Matrix 8	00	Channel Output	Group	20	Fader + ×
Main L	ĸ	Channel Output	Main	21	Fader + ×
Main R	ĸ	Channel Output	Main	22	Fader 🗉 🛛
Main C	≪	Channel Output	Main	23	Fader + ×
Monitor L	((	Channel Output	Monitor	24	+ X
Monitor R	-K	Channel Output	Monitor	R	+ ×

### Hardware Input: ADAT

TER					
H.1 Analog				output Ro	outing 🎽
HARDWARE OUTPUT			SIGNAL SC	URCE	
Aux 1		Hardware Input	Mic/Line	1	<b>+</b> × <b></b>
Aux 2	-80	Hardware Input	Mic/Line	Instance	+ ×
Aux 3	<pre>«</pre>	Hardware Input	ADAT	1	+ =
Aux 4	80	Channel Output	Aux	2	DSP + ×
Aux 5	60	Channel Output	Aux	3	DSP + ×
Aux 6	80	Channel Output	Ch Card	4	DSP + ×
Aux 7	- 60	Channel Output	Aux	5	DSP + ×
Aux 8	80	Channel Output	Aux	6	DSP + ×
Aux 9	-85	Channel Output	Aux	7	DSP + ×
Aux 10	60	Channel Output	Aux	8	DSP + ×
Aux 11	- 65	Channel Output	Aux	9	DSP + ×
Aux 12		Channel Output	Aux	10	DSP + ×
Group/Matrix 1	-85	Channel Output	Aux	11	DSP + ×
Group/Matrix 2	60	Channel Output	Group	12	Fader + ×
Group/Matrix 3	- 65	Channel Output	Group	13	Fader + ×
Group/Matrix 4		Channel Output	Group	14	Fader + ×
Group/Matrix 5	**	Channel Output	Group	15	Fader + ×
Group/Matrix 6		Channel Output	Group	16	Fader + ×
Group/Matrix 7	- 60	Channel Output	Group	17	Fader + ×
Group/Matrix 8		Channel Output	Group	18	Fader + ×
Main L	**	Channel Output	Main	19	Fader + ×
Main R	60	Channel Output	Main	20	Fader + ×
Main C	-80	Channel Output	Main	21	Fader + ×
Monitor L		Channel Output	Monitor	22	+ 8
Monitor R	60	Channel Output	Monitor	23	+ ×
Tape A L	-85	Channel Output	Main	24	DSP + ×
Topo A D		Channel Output	Main	D D.	Deplete

ADAT: Choices 1 to 12 if the sample rate is 88.2 or 96k, and 1 to 24 if the sample rate is 44.1 or 48k.

See ADAT card notes on page 27 for more details.

### Mic/Line: Choices 1 to 24.

### Hardware Input: Line

TER						
H.1 Analog				output	Ro	uting 🚺
HARDWARE OUTPUT	ſ.		SIGNAL SO	URCE		
Aux 1		Hardware Input	Mic/Line	1		+ × 🔽
Aux 2	*	Hardware Input	Mic/Line	1		+ x
Aux 3	00	Hardware Input	ADAT	Instan	ce	+ x
Aux 4		Hardware Input	Line	1		
Aux 5	<b>«</b>	Channel Output	Aux	2		DSP + ×
Aux 6	≪	Channel Output	Ch Card	3		DSP + ×
Aux 7		Channel Output	Aux	4		DSP + ×
Aux 8		Channel Output	Aux	5		DSP + ×
Aux 9	*	Channel Output	Aux	6		DSP + ×
Aux 10	-44	Channel Output	Aux	7		DSP + ×
Aux 11		Channel Output	Aux	8		DSP + ×
Aux 12	00	Channel Output	Aux	11	Pre	DSP + ×
Group/Matrix 1		Channel Output	Aux	12	Pre	DSP + ×

### Hardware Input: SPDIF

TER									
H.1 Analog				outpu	t Ro	utir	ıg	T	
HARDWARE OUTPU	r		SIGNAL SC	DURCE					
Aux 1	*	Hardware Input	Mic/Line	1			+	×	
Aux 2		Hardware Input	Mic/Line	1			+	ж	
Aux 3	(K	Hardware Input	ADAT	Inst	ance		+	×	
Aux 4		Hardware Input	SPDIF	L					
Aux 5	ĸ	Channel Output	Aux	R		DSP	٠	х	
Aux 6	**	Channel Output	Ch Card	1	Pre	DSP	÷	х	

### Hardware Input: Tape

TER.										
H.1	Analog				output	Ro	utin	ıg	ľ	
HAI	RDWARE OUTPUT			SIGNAL SO	URCE					
	Aux 1	-	Hardware Input	Mic/Line	1			+	ж	
	Aux 2	-	Hardware Input	Mic/Line	1			+	ж	_
	Aux 3	**	Hardware Input	ADAT	Instan	ce		÷	ж	
			Hardware Input	Tape	AL					
	Aux 5	**	Channel Output	Aux	AR		DSP	+	×	
	Aux 6	- 20	Channel Output	Ch Card	BL		DSP	÷	ж	
	Aux 7	-	Channel Output	Aux	BR		DSPI	÷	×	
	Aux 8	-	Channel Output	Aux	7	Pre	DSP	+	×	

### Hardware Input: Talkback

IER.										
H.	1 Analog				output	Ro	outir	ng	ľ	
	HARDWARE OUTPUT			SIGNAL SO	URCE					
	Aux 1	((	Hardware Input	Mic/Line	1			+	×	
	Aux 2	**	Hardware Input	Mic/Line	1			+	ж	
	Aux 3	«	Hardware Input	ADAT	Instan	ice		+	х	
			Hardware Input	Talkback	In					
	Aux 5	((	Channel Output	Aux	4	Pre	DSP	÷	×	

Talkback: In.

### Line: Choices 1 to 8.

SPDIF: Choices L, R.

Tape: A L, A R, B L, B R.

## **Card Slot**

If you choose a Card Slot, you can select from the available cards:

ER						
H.1 Analog			tput	Routir	ng `	
HARDWARE OUTPU	т	SIGNAL SOUR	CE			
Aux 1	« Hardware Input	Mic/Line	1		+ ×	
Aux 2	« Hardware Input	Mic/Line	1		+ ×	
Aux 3	« Hardware Input	Туре	1		+ ×	
Aux 4	Card Slot	A - UNet				
Aux 5	Channel Output	B - LP48	4	Pre DSP	+ *	
Aux 6	Channel Output	Ch Card	1	Pre DSP	+ x	

Card Slot: Here we can choose between the LP48 card or the UNet card.

### Card Slot: UNet Card

.1 Analog		· 🔺		utbut Ro	uting
HARDWARE OUTPUT			SIGNAL SO	Instance	
Aux 1	*	Hardware Input	Mic/Line	1	+ ×
Aux 2	« [	Hardware Input	Mic/Line	2	+ x
Aux 3		Hardware Input	ADAT	3	+ X
		Card Slot	A - UNet	4	
Aux 5	≪ [	Channel Output	Aux	о с	DSP ± ×
Aux 6	≪ [	Channel Output	Ch Card	7	DSP 🗄 🛎
Aux 7	<b>«</b>	Channel Output	Aux	6	DSP + ×
Aux 8	«	Channel Output	Aux	0	DSP + ×
Aux 9	"	Channel Output	Aux	10	DSP + ×
Aux 10	*	Channel Output	Aux	11	DSP + ×
Aux 11	<b>«</b>	Channel Output	Aux	12	DSP + ×
Aux 12	«	Channel Output	Aux	13	DSP ± ×
Group/Matrix 1	*	Channel Output	Aux	14	DSP + ×
Group/Matrix 2	«	Channel Output	Group	15	Fader + ×
Group/Matrix 3	*	Channel Output	Group	16	Fader + ×
Group/Matrix 4		Channel Output	Group	17	Fader + ×
Group/Matrix 5	«	Channel Output	Group	18	Fader + ×
Group/Matrix 6	«	Channel Output	Group	19	Fader + ×
Group/Matrix 7	"	Channel Output	Group	20	Fader + ×
Group/Matrix 8		Channel Output	Group	21	Fader + ×
Main L	*	Channel Output	Main	22	Fader + ×
Main R	«	Channel Output	Main	23	Fader + ×
Main C	<b>«</b>	Channel Output	Main	24	Fader 🗄 🖂
Monitor L	*	Channel Output	Monitor	25	+ ×
Monitor R	"	Channel Output	Monitor	26	+ Ж
Tape A L	*	Channel Output	Main	27	DSP + ×
Tape A R	*	Channel Output	Main	28	DSP + ×
AES/SPDIF L	"	Channel Output	Main	29	DSP ± ×
AES/SPDIF R	«	Channel Output	Main	30	DSP ± ×
ADAT 4	11	Channel Output	Ch Dank 4	30	adar of the

UNet card: Choices 1 to 32.

### Card Slot: LP48 Card

				Instan	ce			
				1 - Insert	1			
TER			_	2 - Insert	2			
				3 - Insert	3	utie		Т
n. i Analog				4 - Insert	4	ստ	ig	
HARDWARE OUTPUT			SIGNAL SO	5 - Insert	5			
Aux 1	٠	Hardware Input	Mic/Line	6			+ X	
Aux 2	**	Hardware Input	Mic/Line	7			+ X	1000
Aux 3	٠	Hardware Input	ADAT	8			+ X	
Aux 4		Card Slot	B - LP48	9 - Spkr 1			+ #	
Aux 5	60	Channel Output	Aux	10 - Spkr	2	DSP.	+ ×	
Aux 6	٠	Channel Output	Ch Card	11 - Spkr	3	DSP	+ ×	
Aux 7	"	Channel Output	Aux	12 - Spkr	4	DSP	+ X	
Aux 8	€€	Channel Output	Aux	13		DSP	+ X	
Aux 9	**	Channel Output	Aux	14		DSP.	+ x	
Aux 10	((	Channel Output	Aux	15		DSP	+ ×	
Aux 11	((	Channel Output	Aux	16		DSP.	+ ×	
Aux 12	**	Channel Output	Aux	17 - Inser	t 6	DSP	+ ×	
Group/Matrix 1	**	Channel Output	Aux	18 - Inser	t 7	DSP	+ x	
Group/Matrix 2	€€	Channel Output	Group	19 - Inser	t 8	Fader	+ X	
Group/Matrix 3		Channel Output	Group	20 - Inser	t 9	Fader	+ ×	
Group/Matrix 4	66	Channel Output	Group	21 - Inser	t 10	Fader	+ ×	
Group/Matrix 5		Channel Output	Group	22		Fader	+ ×	
Group/Matrix 6	*	Channel Output	Group	23		Fader	+ X	
Group/Matrix 7	46	Channel Output	Group	24		Fader	+ X	
Group/Matrix 8	**	Channel Output	Group	25 - Spkr	5	Fader	+ ×	
Main L	60	Channel Output	Main	26 - Spkr	6	Fader	+ x	
Main R	60	Channel Output	Main	27 - Spkr	7	Fader	+ x	
Main C	*	Channel Output	Main	28 - Spkr	8	Fader	+ ×	
Monitor L	**	Channel Output	Monitor	29			+ x	
Monitor R	40	Channel Output	Monitor	30			+ X	
Tape A L	**	Channel Output	Main	31		DSP.	+ ×	
Tape A R		Channel Output	Main	32		DSP	+ ×	
AES/SPDIF L		Channel Output	Main	L	Pre	DSP	+ ×	
AES/SPDIF R	**	Channel Output	Main	R	Pre	DSP	+ X	
ADAT 4		Channel Output	Ch Danked		Documents of the local division of the local	-		100

LP48 card: If the LP48 card has been configured as a 4x8 Loudspeaker Processor, there will be 8 outputs available as shown. These represent the outputs of the various crossovers of the LP48. The Insert EQs are greyed-out and not available for selection.

Note that the inputs to the LP48 card are chosen in the Setup>Expansion screen.

1

1.1 Analog		LINK	Expansion
LAKE LP-48 C	ARD 2		EXPANSION SLOT B
	Certai		CARD TYPE
	Terret		LP48
	EDT Contract		4x8 Speaker
D	Decises Sectors		EDIT

LP48 card: If the LP48 card has been configured as a 2x4 Loudspeaker Processor, with 5 Insert EQs, there will be 4 outputs available as shown. These represent the outputs of the various crossovers. The Insert EQs are greyedout and not available for selection. (The EQ'd signals return to the insert point they came from.)

See additional details described in the input routing screen on page 12.

				matune	•				
				1 - Insert 1					
CR				2 - Insert 2	2				
1 1 Analog				3 - Insert 3	3	utir	ha	•	ſ
I. I Analog	_			4 - Insert 4	1	uun	чy	_	L
HARDWARE OUTPUT			SIGNAL SC	5 - Insert 5	5			_	
Aux 1		Hardware Input	Mic/Line	6			+	8	
Aux 2		Hardware Input	Mic/Line	7			+		
Aux 3	~	Hardware Input	ADAT	8			+	Χ.	
Aux 4		Card Slot	B - LP48	9 - Spkr 1		_	+	٠.	
Aux 5	*<	Channel Output	Aux	10 - Spkr 2	2	DSP	+	×	
Aux 6		Channel Output	Ch Card	11 - Spkr 3	3	DSP	+	Ξ.	
Aux 7		Channel Output	Aux	12 - Spkr 4	4	DSP	±.	Ξ.	
Aux 8	~	Channel Output	Aux	13		DSP	+	8	
Aux 9	К	Channel Output	Aux	14		DSP	+	×	
Aux 10	<b>{</b> (	Channel Output	Aux	15		DSP	+	×	
Aux 11	*	Channel Output	Aux	16		DSP	+	×	
Aux 12	60	Channel Output	Aux	17 - Insert	6	DSP.	+	×	
Group/Matrix 1	60	Channel Output	Aux	18 - Insert	7	DSP.	+	×	
Group/Matrix 2		Channel Output	Group	19 - Insert	8	Fader	+	×	
Group/Matrix 3	К	Channel Output	Group	20 - Insert	9	Fader	+	×	
Group/Matrix 4	٠	Channel Output	Group	21 - Insert	10	Fader	•	×	
Group/Matrix 5		Channel Output	Group	22		Fader	+	×	
Group/Matrix 6		Channel Output	Group	23		Fader	+	×	
Group/Matrix 7	60	Channel Output	Group	24		Fader	+	×	
Group/Matrix 8	€€	Channel Output	Group	25 - Spkr 5	5	Fader	+	×	
Main L		Channel Output	Main	26 - Spkr 6	6	Fader	+	×	
Main R	٠	Channel Output	Main	27 - Spkr 7	7	Eader	+	×	
Main C	€€	Channel Output	Main	28 - Spkr 8	3	Eader	+	×	
Monitor L		Channel Output	Monitor	29			+	×	
Monitor R		Channel Output	Monitor	30			+	×	
Tape A L		Channel Output	Main	31		DSP	+	×	
Tape A R	**	Channel Output	Main	32		DSP	+	×	
AES/SPDIF L		Channel Output	Main	L	Pre	DSP	+	x	
AES/SPDIF R		Channel Output	Main	R	Pre	DSP	+	×	
					-	-			

### Card Slot Routing Notes

Routing to and from I/O cards is handled by signal paths. The TT24 supports a maximum of 32 input and output signal paths to/from each card slot. But, some cards (LP48) have less then 32 inputs/outputs. Routing signals to these cards on these higher number signal paths will have no effect, but because the routing is stored in the console, we support routing to all signal path numbers no matter which card is installed.

If a card is installed that does not support all 32 signal paths, the unused signal path numbers are shown in grey indicating that they are still routable but that they are unused. Routing to/from these greyed out signal paths will therefore have no effect although you can still make the routing connections. Similarly, if the console does not have a card in slot A and/or B, the signal paths for the entire card slot will appear in grey again indicating that they are still routable although no audio will pass. Finally, some cards (LP48) have multiple operating modes and each mode may have a different number of supported signal paths. Therefore as the mode is changed, the number of available versus greyed-out source and destination signal path numbers will change.

The above method allows for cards to be changed while keeping routings intact. Existing routings will just use the corresponding input/output from the newly added card. This gives consistent and reliable operation that you can easily understand and change when a new card is installed and you hear audio you are not expecting.

Card Type	Mode	Available Card Signal Path Sources	Available Card Signal Path Destinations	
UFXII	Channel 25-48 DSP	None (routing done automatically)	None (routing done automatically)	
LP48	4 x 8 Speaker Processor	9-12 (Spkr 1-4) 25-28 (Spkr 5-8)	None (routing done on the Setup>Expansion screen)	
	2 x 4 Speaker Processor / 10 Insert EQ	9-12 (Spkr 1-4)	None (routing done or the Setup>Expansion screen)	
	10 Insert EQ	None (routing done on the setup>Expansion screen)	None (routing done on the Setup>Expansion screen)	
ADAT	44.1/48 kHz	None, see ADAT table below	None, see ADAT table below	
	88.2/96 kHz	None, see ADAT table below	None, see ADAT table below	
U100	FOH/MON/DS3232 U-Net Routing	32	32	
	Master/Slave Console Linking	None	None	

This operation is described for each card type and mode combination in the table below; note that each card slot is handled independently:

### **ADAT Notes**

The available built-in ADAT I/O and an ADAT card interact with sample rate changes. Because the channel-count halves for ADAT at the 88.2/96k rating, special consideration must be taken.

At 88.2/96k, half of the built in ADAT I/O (sources and destinations) will be unavailable and will be shown with the destination number in the output routing table greyed out. Similarly, the input and output routing will also indicate half of the sources are unavailable at 88.2/96k but still routable. Again, these will still be assignable and will resume functionality if you changes back to 44.1/48k. Adding an ADAT card will allow all the sources and destinations to be available at all sample rates. The card automatically routes the inputs and outputs for the additional I/O. It therefore is not directly routable.

There are three supported ADAT related configurations: no cards, 1 card in Slot A, and 1 card in Slot B. Two ADAT cards are not supported at this time. The various scenarios are summarized in this table:

ADAT	Mode	Built In ADAT I/O
Built-In	44.1/48 kHz	1-24
	88.2/96 kHz	1-12
Built-In and Card A	44.1/48 kHz	1-24
	88.2/96 kHz	1-24
Built-In and Card B	44.1/48 kHz	1-24
	88.2/96 kHz	1-24

# 2.3 U-Net Routing Screens

If you are using a single TT24 and a DS3232, then the input and output routing screens allow you to choose the desired input and output routing. These two screens are generally all that you will need.



For a single TT24 console, the input and output screens allow you to configure all the TT24 console inputs and outputs, including the U100 card. For example, the U100 card in slot A can receive the inputs from your digital snake, and it can also send the LP48 card loudspeaker crossover outputs to the snake and off to your power amplifiers.

If you have two TT24 consoles and wish to link them together, you can use the U-Net routing screens. These are required to pass signals between the two U-Net cards. Using the U-Net routing allows the two TT24 consoles to share the digital snake and other inputs. For example, microphones connected to the snake can pass their signals to both consoles.



You must manually route up to 32 signals to and from each card using the Output Routing screen as described previously. You must also choose up to 32 signals to route-into and another 32 to route-out of the card slot signal paths themselves. This is done using the U-Net Routing screens. Because this can be labor intensive, many common setups are provided as routing presets. See Routing Presets on page 6.

Two U-Net Routing screens are available: one to route from Card Slot A to B and one to route from Card Slot B to A. Routing from Card Slot A to B involves choosing up to 32 U-Net signals to receive at the input of card A. You can then choose to route these signals directly back out of U-Net card B. This complements the Card A to B patching that can be done in the Output Routing screen. Routing from Card B to A is essentially the inverse. Otherwise, the two screens are the same. If one or the other U-Net cards is not installed, the routings will appear greyed out, but they can still be viewed and edited allowing configuration of the network in advance without a U100 card.

Each Routing screen is in two parts: receive and send. For example, the UNetAB Routing screen shows:

- U100 Slot A: Receive
- U100 Slot B: Send

In the Slot A Receive section, you can select the particular signals that you want to come into the Slot A Card either from a DS3232 or another TT24.

In the Slot B Send area, you can select the output signals available from the Card Slot B Sends.

Each U-Net Routing screen has a column of fields to select the 32 receive signals, and another one for the 32 send signals. An arrow at the top helps to illustrate the send/return relationship. Double clicking on this arrow is a shortcut to switch between the two U-Net routing screens. For each send or receive signal path, five drop down menus are necessary to define a U-Net signal:

- Product (DS3232 or TT24)
- Instance
- Signal Type
- Number
- Node

Double-click the arrow to see the next Routing screen

🦹 tt control v1.70 FOH MASTER	
CH.1 Analog 🛛 🖌	LINK UNetAB Routing Menu Files
U100 SLOT A: RECEIVE	U100 SLOT B: SEND
DS3232 1 Input 1 Pre Fader + ×	1 TT24 FOH Master Out Main L Pre DSP + ×
DS3232 1 Input 2 Pre Fader + *	2 TT24 FOH Master Out Main R Pre DSP + *
DS3232 1 Input 3 Pre Fader + ×	3 TT24 FOH Master Out Main C/M Pre DSP + *
DS3232 1 Input 4 Pre Fader + ×	
Product Instance Signal Type Number Node	Product Instance Signal Number Node
Increment Routing (+)	Increment Routing (+)
Clear Routing (X)	Clear Routing (X)
U100 Slot A: RECEIVE	Scroll up or down U100 Slot B: SEND



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If you choose a U-Net Send signal that originates in the console (e.g. TT FOH Master Aux 1), the corresponding connection will also be automatically made in the Output Routing screen. The inverse is also true: if you route a signal to a Card Slot output signal path on the Output Routing screen, the corresponding signal will automatically be chosen in the appropriate U-Net Routing screen.

If you choose a U-Net Send signal that does not originate in the console (e.g. DS3232 Input 1), it will automatically be requested at the opposite card's U-Net Receive input. The corresponding Output Routing screen selection routing one card to the other will also be made.

## **Selection Examples**

The following example screens show the selections available for U100 Slot A: Receive. The same choices are available on Slot A or B, Send or Receive.

### DS3232 on a Card Slot RECEIVE

🔏 tt control v1.70	FOH MAS	TER			Select DS3232.
	С	H.1 Ana	og		
Product		J100 SLOT A: RE	CEIVE		
DS3232	1	Input	1	Pre Fader + 📕	
TT24	_1	Input	2	Pre Fader + ×	
DS3232	1	Input	3	Pre Fader + ×	
DS3232	1	Input	4	Pre Fader + ×	
DS3232	1	Input	5	Pre Fader + ×	
	POLINAR	750			Colort 1
tt control v1.70	FUHMAS	TER	_		Select 1.
	С	H.1 Ana	og	· 🔺	
	Instar	ICE DT A: RE	CEIVE	_	
DS3232 1		put	1	Pre Fader + 🗴	
DS3232	1	Input	2	Pre Fader + ×	
DS3232	1	Input	3	Pre Fader + ×	
👔 tt control 🛛 1.70	FOH MAS	TER			Select Input.
	С	H.1 Ana	log	× 🔺	1
	l	Type	E		
DS3232	1	Input	1	Pre Fader + 🕷	
DS3232	1	Input	2	Pre Fader + ×	
DS3232	1	Input	3	Pre Fader + ×	
DC2222	4	Innet	-	Due Carlen V	
Instance	G	1.7.7.	0	1 . 00	
1 Instance	Se	elect Insta	nce f	rom 1 to 32.	
2	Δ.	ll ana Dra I	Today		
3	A	ii ale Fre I	auer		
4	Se	o, what ha	ve we	e done?	

We have set the U100 Slot A channel 1 so it will receive only the DS3232 signal that corresponds to our selections. The card is ready for the input of a DS3232 signal 1 on Card A receive channel 1. The card inputs can now be routed to input channels.

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#### DS3232 on a Card Slot SEND

This example shows the U100 Slot B: SEND set up in exactly the same way as shown for the Slot A: RECEIVE on the previous page:



Here we have set the U100 Slot B SEND channel 1 so it will send only the DS3232 signal that corresponds to our selections. Card B Send is ready to send DS3232 signals.

You will notice that when you select the DS3232 as your send, the U100 Slot A: RECEIVE will also change to the same selection. This auto-filling-in of the receive side only happens if you are sending a signal that does not originate from the host console. The card is getting ready to send something it doesn't have, so it gets ready to find and receive it first.

If, in the above example, we now set up to send a TT24 FOH Master signal, the receive side will not change:

🦹 tt control 🛛 1.7	70 FOH MAS	TER									
	С	H.1 Ana	log			LINK	UNetAB Routi	ing*	Menu	File	es T
	ι	J100 SLOT A: RE	ECEIVE			-	U100 SLOT B	: SEND			
DS3232	1	Input	1	Pre Fader + ×	1	TT24	FOH Master Out Main	L	Pre DS	> + x	
DS3232	1	Input	2	Pre Fader + ×	2	TT24	FOH Master Out Main	R	Pre DSF	2 + ×	
DS3232	1	Input	3	Pre Fader + ×	3	TT24	FOH Master Out Main	C/M	Pre DSI	• + ×	

### TT24 on a Card Slot RECEIVE

Lt control v1.70 FOH MASTER								
🔽 CH.1 Analog 🎽 🔼								
	Instance	OT A: RE	CEIVE					
TT24	FOH Master	Main	L	Pre DSP + 📕 1				
DS3232	FOH Slave	put	2	Pre Fader + × 2				
DS3232	MON Master	out	3	Pre Fader + × 3				
DS3232	MON Slave	put	4	Pre Fader + × 4				
DS3232	1 lr	iput	5	Pre Fader + × 5				
DS3232	1 Ir	nput	6	Pre Fader + × 6				

Select TT24, and the choices are:

FOH Master

FOH Slave

MON Master

MON Slave

Each of these selections has extra menus as shown in the next few pages of this guide:

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	CH	I.1 Analo	g		
	U1	Туре	Έ	_	
TT24	FOH Master	Out Main	_	Pre DSP + 🕷	
DS3232	1	Out Aux	2	Pre Fader + 🗙	2
DS3232	1	Out Group	3	Pre Fader + 🗶	3
DS3232	1	Out Matrix	4	Pre Fader + 🗙	4
DS3232	1	Out Monitor	5	Pre Fader + 🗙	5
DS3232	1	Ch Bank 1	6	Pre Fader + 🗙	6
DS3232	1	Ch Bank 2	7	Pre Fader + 🗙	7
DS3232	1	Ch Line	В	Pre Fader + 🗙	8
DS3232	1	Ch FX	9	Pre Fader + 🗙	9
DS3232	1	Ch Card	0	Pre Fader + 🗙	10
DS3232	1	In Mic/Line	1	Pre Fader + 🗶	11
/		In ADAT			12
/		In Line			13
/		In AES/SPDIF			14
/		In Tape			15
/		In Talkback			16
		Card A			17
/		Card B			18
					19
					20

Select FOH Master, and the choices are: Out Main, Out Aux, Out Group, Out Matrix, Out Monitor, Ch Bank 1, Ch Bank 2, Ch Line, Ch FX, Ch Card, In Mic/Line, In ADAT, In Line, In AES/SPDIF, In Tape, In Talkback, Card A and Card B.

Main: Choose L, R, C (or M)



The choices are: Pre DSP or Post Fader



Aux: Choose 1 to 12



Pre DSP or Post Fader

The choices are:



Group: Choose 1 to 8



Matrix: Choose A to H



The choices are: Pre Delay or Post Delay



😗 tt control v1.70 FOH MASTER	
CH.1 Ana	alog 🍡 🔼
U100 SLOT A: F	RECEIVE
TT24 FOH Master Out Main	Instance DSP + × 1
TT24 FOH Master Out Monitor	L + × 2
DS3232 1 Input	R Fader + × 3
DS3232 1 Input	4 Pre Fader + × 4
Dealan d Innut	E Dro Fodor I III



Monitor: Choices are L or R.

Ch Bank 2: Choices are 25 to 48 (Pre Fader)



Ch Line: Choices are 1 to 8 (Pre Fader)



In Mic/Line: Choices are 1 to 24 (Input)



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Ch FX:

Choices are 1L, 1R, 2L, 2R, 3L, 3R, 4L and 4R (Pre Fader)

### Mackie TT24 Digital Live Console Owner's Manual Addendum v1.7



### TT24 on a Card Slot SEND

This example shows the U100 Slot B: SEND set up to send the FOH Master main outputs. As these signals originate in the host console (set to FOH Master) setting the sends does not affect the receive settings (here the dashes show no assignment).

🥂 tt control 🕫	.70 FOH MASTI	R								-02
	CH	I.1 Ana	alog			LINK	JNetAB Routir	ng	Menu	Files
	U	100 SLOT A: F	RECEIVE			-	U100 SLOT B: S	SEND		
			-	-	1	TT24	FOH Master Out Main	L	Pre DSP	+ × 📉
					2	TT24	FOH Master Out Main	R	Pre DSP	+ ×
				an an an an a	3	TT24	FOH Master Out Main	C/M	Pre DSP	+ ×
					T F C 1	↑ T24 TOH Ma Ch Ban <sup>†</sup> -24 —	aster k 11 to 32			
					Р	re Fac	ler			
					L		- U100 Slot B: SE	END		

If we change the Send signals to MON Master, these signals do not originate on the host console (configured as a FOH Master), so they must be found. In this case, the Receives have all been set automatically to the MON Master settings.



## 2.4 DS3232 Routing Macros

Because you can now use input routing to freely assign any hardware input to any channel, you can assign some snake signals to bank 1, some to bank 2, and still others to bank 3. This can be done per channel as previously described. Additionally, three macro buttons makes quick routing possible for all snake inputs.



On the Expansion screen with a DS3232 present, if ANALOG is pressed, the analog snake inputs are automatically assigned in the Input Routing screen to the analog inputs:

Analog		ик Пррі	it Routin	đ
INPUT CHANNEL	sigi	NAL SOURCE	it i to at in	9
Analog 1 «	Card Slot	A - UNet	1 + =	
Analog 2 «	Card Slot	A - UNet	2 + ×	
Analog 3 «	Card Slot	A - UNet	3 + ×	
Analog 4 《	Card Slot	A - UNet	4 + ×	
Analog 5 «	Card Slot	A - UNet	5 + ×	
Analog 6 «	Card Slot	A - UNet	6 + ×	
Analog 7 《	Card Slot	A - UNet	7 + ×	
Analog 8 《	Card Slot	A - UNet	8 + ×	
Analog 9 «	Card Slot	A - UNet	9 + ×	
Analog 10 «	Card Slot	A - UNet	10 + ×	
Analog 11 «	Card Slot	A - UNet	11 + ×	
Analog 12 《	Card Slot	A - UNet	12 + ×	
Analog 13 «	Card Slot	A - UNet	13 + ×	
Analog 14 《	Card Slot	A - UNet	14 + ×	
Analog 15 «	Card Slot	A - UNet	15 + ×	
Analog 16 《	Card Slot	A - UNet	16 + ×	
Analog 17 «	Card Slot	A - UNet	17 + ×	
Analog 18 《	Card Slot	A - UNet	18 + ×	
Analog 19 «	Card Slot	A - UNet	19 + ×	
Analog 20 《	Card Slot	A - UNet	20 + ×	
Analog 21 《	Card Slot	A - UNet	21 + ×	
Analog 22 《	Card Slot	A - UNet	22 + ×	
Analog 23 «	Card Slot	A - UNet	23 + ×	
Analog 24 《	Card Slot	A - UNet	24 + ×	
Digital 25 «	Hardware Input	ADAT	25 + ×	
Digital 26 《	Hardware Input	ADAT	26 + ×	
Digital 27 «	Hardware Input	ADAT	27 + ×	
Digital 28 «	Hardware Input	ADAT	28 + ×	
Digital 29 «	Hardware Input	ADAT	29 + × 🗖	-
Digital 20 //	Hardware Innut	ADAT	20	

In the Input Routing screen, the analog inputs are automatically filled with the card slot U-Net card inputs.



In the Expansion screen, if DIGITAL is pressed, the digital snake inputs are automatically assigned in the Input Routing screen to the digital inputs as shown on the next page of this guide.

Digital

Analog		T 🔺 🛛 🖬	ик Іпрі	ut Ro	outina
INPUT CHANNEL		SIGN	NAL SOURCE		
Analog 23	u	Hardware Input	Mic/Line	23	i e i e i 🖂
Analog 24	40	Hardware Input	Mic/Line	24	
Digital 25	æ	Card Slot	A - UNet	1	
Digital 26		Card Slot	A - UNet	2	+ ×
Digital 27		Card Slot	A - UNet	3	+ ×
Digital 28	"	Card Slot	A - UNet	4	+ ×
Digital 29	«	Card Slot	A - UNet	5	+ ×
Digital 30	<b>«</b>	Card Slot	A - UNet	6	+ x
Digital 31	<b>«</b>	Card Slot	A - UNet	7	+ x
Digital 32	**	Card Slot	A - UNet	8	+ ×
Digital 33		Card Slot	A - UNet	9	+ x
Digital 34	**	Card Slot	A - UNet	10	+ ×
Digital 35		Card Slot	A - UNet	11	+ x
Digital 36		Card Slot	A - UNet	12	+ x
Digital 37		Card Slot	A - UNet	13	+ x
Digital 38	**	Card Slot	A - UNet	14	+ x
Digital 39	**	Card Slot	A - UNet	15	- ×
Digital 40	**	Card Slot	A - UNet	16	<b>+ x</b>
Digital 41		Card Slot	A - UNet	17	- x .
Digital 42	"	Card Slot	A - UNet	18	+ ×
Digital 43	≪	Card Slot	A - UNet	19	+ *
Digital 44	<b>«</b>	Card Slot	A - UNet	20	+ ×
Digital 45	<b>«</b>	Card Slot	A - UNet	21	+ *
Digital 46	"	Card Slot	A - UNet	22	+ x
Digital 47	"	Card Slot	A - UNet	23	+ x
Digital 48	<b>«</b>	Card Slot	A - UNet	24	+ x
Line In 1	≪ [	Hardware Input	Line	1	+ ×
Line In 2	*	Hardware Input	Line	2	+ ×
Line In 3	«	Hardware Input	Line	3	+ × 🗸

In the Input Routing screen, the digital inputs are automatically filled with the card slot U-Net card inputs.



In the Expansion screen, if NONE is selected, then no Snake inputs are automatically assigned to the U-Net cards:

- None

Analog			NK Inp	ut Ro	outin	ıg
INPUT CHANNEL		SIG	NAL SOURCE			
Analog 1	« Hard	ware Input	Mic/Line	1	+ *	1
Analog 2	« Hard	ware Input	Mic/Line	2	+ ×	-
Analog 3	<b>«</b> Hard	ware Input	Mic/Line	3	+ ×	
Analog 4	« Hard	ware Input	Mic/Line	4	+ ×	
Analog 5	« Hard	ware Input	Mic/Line	5	.+×	
Analog 6	<b>«</b> Hard	ware Input	Mic/Line	6	+ ×	
Analog 7	« Hard	ware Input	Mic/Line	7	+×	
Analog 8	« Hard	ware Input	Mic/Line	8	+ ×	
Analog 9	<b>« Hard</b>	ware Input	Mic/Line	9	+ ×	
Analog 10	« Hard	ware Input	Mic/Line	10	.+×	
Analog 11	« Hard	ware Input	Mic/Line	11	+ ×	
Analog 12	<b>« Hard</b>	ware Input	Mic/Line	12	+ ×	
Analog 13	« Hard	ware Input	Mic/Line	13	+ ×	
Analog 14	<b>«</b> Hard	ware Input	Mic/Line	14	+ ×	
Analog 15	<b>«</b> Hard	ware Input	Mic/Line	15	+ ×	
Analog 16	« Hard	ware Input	Mic/Line	16	+ ×	
Analog 17	<b>«</b> Hard	ware Input	Mic/Line	17	+ ×	
Analog 18	<b>K</b> Hard	ware Input	Mic/Line	18	+ ×	
Analog 19	« Hard	ware Input	Mic/Line	19	+ ×	

Analog			NK Inpu
INPUT CHANNEL		SIG	NAL SOURCE
Digital 33		maruware input	ADAL
Digital 36	**	Hardware Input	ADAT
Digital 37	«	Hardware Input	ADAT
Digital 38	«	Hardware Input	ADAT
Digital 39	«	Hardware Input	ADAT
Digital 40	«	Hardware Input	ADAT
Digital 41	«	Hardware Input	ADAT
Digital 42	«	Hardware Input	ADAT
Digital 43	«	Hardware Input	ADAT
Digital 44	«	Hardware Input	ADAT
Digital 45	«	Hardware Input	ADAT
Digital 46	«	Hardware Input	ADAT
Digital 47	«	Hardware Input	ADAT
Digital 48	«	Hardware Input	ADAT
Line In 1	«	Hardware Input	Line
Line In 2	*	Hardware Input	Line
Line In 3	«	Hardware Input	Line
Line In 4	«	Hardware Input	Line
Line In 5	«	Hardware Input	Line
Line In C	100	Linedromen Immod	Line

### DS3232 Routing Macros output routing

OII MASTIR (Online)		-			
H.1 Analog		LINK	Dutput	Routing *	N
HARDWARE OUTPUT		SIGNAL S	OURCE		
Card A - UNet 3 (	Channel Output	Aux	3	Post Fader + =	
Card A - UNet 4 «	Channel Output	Aux	4	Post Fader 🗄 🖂	
Card A - UNet 5 «	Channel Output	Aux	5	Post Fader = =	
Card A - UNet 6 «	Channel Output	Aux	6	Post Fader = =	
Card A - UNet 7 «	Channel Output	Aux	7	Post Fader 🗄 🖃	
Card A - UNet 8 «	Channel Output	Aux	8	Post Fader = =	
Card A - UNet 9 «	Channel Output	Aux	9	Post Fader + =	
Card A - UNet 10 «	Channel Output	Aux	10	Post Fader + ×	
Card A - UNet 11 «	Channel Output	Aux	11	Post Fader = =	
Card A - UNet 12 «	Channel Output	Aux	12	Post Fader + =	
Card A - UNet 13 «	Channel Output	Group		Post Fader + =	
Card A - UNet 14 «	Channel Output	Group	2	Post Fader + =	
Card A - UNet 15 «	Channel Output	Group	3	Post Fader + ×	
Card A - UNet 16 «	Channel Output	Group	0 <b></b>	Post Fader + =	
Card A - UNet 17 «	Channel Output	Group	5	Post Fader + =	
Card A - UNet 18 «	Channel Output	Group	6	Post Fader + ×	
Card A - UNet 19 «	Channel Output	Group	7	Post Fader + ×	
Card A - UNet 20 «	Channel Output	Group	8	Post Fader + ×	
Card A - UNet 21 «	Card Slot	B - LP48	9 - Spkr 1	+ *	
Card A - UNet 22 «	Card Slot	B - LP48	10 - Spkr 2	+ x -	
Card A - UNet 23 «	Card Slot	B - LP48	11 - Spkr 3	+ 8	
Card A - UNet 24 «	Card Slot	B - LP48	12 - Spkr 4	+ 8	
Card A - UNet 25 «	Card Slot	B - LP48	25 - Spkr 5	+ x	
Card A - UNet 26 «	Card Slot	B - LP48	26 - Spkr 6	+ 1	
Card A - UNet 27 «	Card Slot	B - LP48	27 - Spkr 7	+ ×	
Card A - UNet 28 «	Card Slot	B - LP48	28 - Spkr 8	+ 1	
Card A - UNet 29 «	Hardware Input	Talkback	c In	1 × ×	
Card A - UNet 30 «	Channel Output	Main		Post Fader + =	
Card A - UNet 31 «	Channel Output	Main	R	Post Fader + =	-
Card A - UNet 32 «	Channel Output	Main	M	Post Fader = =	$\mathbf{M}$

In the Expansion screen, if DIGITAL or ANALOG are pressed, the outputs to the digital snake are automatically assigned in the Output Routing screen.

The outputs to the snake are:

Auxes 1 to 12, post fader.

Groups 1 to 8, or Matrix instead if assigned.

LP48 outputs (if LP48 card present) or Auxes again (if LP48 not present). Some or all of the LP48 outputs may be greyed-out and so not available, depending on the mode of the LP48 card.

Talkback.

Main outputs L, R, and M (or C).

### **Additional Controls**

### Snake assigned to channel

If a snake is assigned to an input channel, the following additional controls are shown for the channel overview:



Mic Pre Gain

Pad

48V

Snake Digital Trim (note that this is a different parameter than the digital trim shown when a snake is not assigned – see gain compensation in section 3.1 or more information)



### Snake not assigned to channel





If a single snake input is routed to more then one channel, then all channels fed by the snake input will see and have control of the same mic pre. This is because there is only a single mic pre, pad, and +48V for each input in the snake, and it therefore will affect all channels fed by that snake input. All snake digital trims are independent per channel.

### 2.5 Snapshot Filtering

### Routing

Routing is saved in a snapshot and is filtered with three new "routing" filter buttons:

- Inputs Filters out all Input routing changes
- Outputs Filters out all Output routing changes
- U-Net Filters out all U-Net (A to B and B to A) routing changes.

Unless filtered, loading a snapshot will change the entire console routing to that stored in the snapshot. When filtered, a snapshot will not recall any corresponding routing changes. Note that when doing U-Net routing, it usually makes sense to either enable or disable all three routing buttons at once since U-Net routing generally requires input and output routing changes as well. Two other (non-routing) filters are also added: LP48 and Mic Pre, and you can filter the card channels on Bank 3. New Snapshot Filters



🗖 #20 🔼	SNAPSHOT	"S FILES"	#20		SNAPSHOT:	S FILE
			BAN	< 3 (Effect	s Returns)	
		СОМР	IFX 1L		1 CARD 1	
		GATE	IFX 1R			-
	PAN 🗌	AUX				-
CHANNEL FILTERING	ΕΟ Π	OTHERS	IFX 2L		3 CARD 3	
BANK 1 (ANLG)			IFX 2R		4 🗌 CARD 4	1
BANK 2 (DIGI)		OUTPUT	IFX 3L		5 🔲 CARD 5	
BANK 3 (RTN)		U-NET	IFX 3R		6 🗌 CARD 6	•
BANK 4 (MAST)	FX 1	FX 2	IFX 4L		7 🔲 CARD 7	
MATRIX A-H	FX3 FX4	LP 48	IFX 4R		8 🔲 CARD 8	BACK

### Snapshot Filtering - Mic Pre

✓ #20 ▲	<b>SNAPSH</b>	ЭΤ	S	FILES
	FADER		CON	IP
	MUTE		GAT	E
	PAN		AUX	< )
	EQ		OTH	RS
BANK 1 (ANLG)				
BANK 2 (DIGI)	MIC PRE		OUTP	UTS
BANK 3 (RTN)	INPUTS		U-N	ET
BANK 4 (MAST)	FX 1		FX 2	2
MATRIX A-H	FX 3	FX 4		LP48

Snapshot filtering has a new filter added called MIC PRE. The following parameters will not be recalled when this filter is enabled:

- Snake Gain
- Snake Pad
- Snake 48v
- Digital Trim (previously filtered by Others and available even if a snake is not connected)
- Polarity Inverse (previously filtered by Others and available even if a snake is not connected)

if the control	ol v1.7.0 FOH MASTER						al X
-	CH.1 An	alog			napshots	Menu	Files
No.	SNAPSHOT TITLE	LOCK	SNAPSHOT	PARAMETER I	FILTERING	FILTERED CHAN	NEL BANK
1	-Empty-		0	ACTIVE		Bank 1 (An	alog)
2	-Empty-	100			_	Analog	
3	-Empty-		FADER MU	TE PAN	EQ	Analog	
4	-Empty-		COMP GA	TE AUX	OTHERS	Analog	5
5	-Empty-					Analog	-
6	-Empty-		MIC PRE INP		TS H-NET	Analog	
7	-Empty-					Analog s	
8	-Empty-		FX 1 FX2	FX 3 F	X 4 LP48	Analog	-
9	-Empty-		CHANNE		EL ECT	Analog	
10	-Empty-		GRANIE	C FILI CHING SI		Analog	<u>p</u>
11	-Empty-		BANK 1 (ANALO	G) BA	NK 2 (DIGI)	Analog s	10
12	-Empty-		BANK 3 (EFFEC	IS) BANK	4 (MASTERS)	Analog	10
13	-Empty-			AATTIN A		Analog	
14	-Empty-			MATRIX A - H		Analog	12
15	-Empty-		CHANNELS	FILTERED	CHAN#	Analog	13
16	-Empty-				1000	Analog	14
17	-Empty-					Analog	10 Ie
18	-Empty-					Analog	10
19	-Empty-					Analog	1
20	-Empty-					Analog	8
21	-Empty-					Analog	19
22	-Empty-					Analog A	20
23	-Empty-					Analog 2	
24	-Empty-					Analog 2	22
C DOOR		r prouve				Analog 2	23
PHOTE	CI CLEAR STOR	RECALL			5-d	Analog 2	24

### Snapshot Filtering – LP48 card

Snapshot filtering has a new filter added called LP48. All the parameters of the LP48 card and the card setup found on Setup>Expansion will not be recalled when this filter is enabled:

<b>▼ #</b> 20 🔺	SNAPSHOTS FILES								
	FADER	COMP							
	MUTE	GATE							
	PAN	AUX							
	EQ	OTHERS							
BANK 1 (ANLG)									
BANK 2 (DIGI)									
BANK 3 (RTN)		U-NET							
BANK 4 (MAST)	FX 1	FX 2							
MATRIX A-H	FX 3	FX4 LP48							

LP48 Snapshot Filter

if the contr	ol v1.7.0 FOH MASTER	1 102 - 1 - 1 - 1	
-	CH.1 Analog	🖌 🔜 🖾 Snapshots	Menu Files
No.	SNAPSHOT TITLE LOCK	SNAPSHOT PARAMETER FILTERING	FILTERED CHANNEL BANK
1	-Empty-	ACTIVE	Bank 1 (Analog)
2	-Empty-		Analog d
3	-Empty-	FADER MUTE PAN EQ	Analog 1
4	-Empty-	COMP GATE AUX OT ERS	Analog 2
5	-Empty-		Analog 3
6	-Empty-		Analog 4
7	-Empty-		Analog 5
8	-Empty-	FX 1 FX2 FX 3 FX 4 LP48	Analog 6
9	-Empty-		Analog 7
10	-Empty-	CHANNEL FILTERING SELECT	Analog 8
11	-Empty-	BANK 1 (ANALOG) BANK 2 (DIGI)	Analog 9
12	-Empty-	BANK 3 (EFFECTS) BANK 4 (MASTERS)	Analog 10
13	-Empty-		Analog 11
14	-Empty-	MATHIX A - H	Analog 12
15	-Empty-	CHANNELS FILTERED CHAN#	Analog 13
16	-Empty-		Analog 14
17	-Empty-		Analog 15
18	-Empty-		Analog 16
19	-Empty-		Analog 17
20	-Empty-		Analog 18
21	-Empty-		Analog 19
22	-Empty-		Analog 20
23	-Empty-		Analog 21
24	-Empty-		Analog 22
-			Analog 23
PROTE	CT CLEAR STORE RECALL		Analog 24

## 3.0 Front of House / Monitor Console Linking

Front of House / Monitor Console Linking allows the support of two TT24s (one in front of house master position and the other in monitor master position) and one DS3232.

The Snake is connected to a U100 in the Monitor Master TT24 while a second U100 card in the monitor TT24 connects to a third U100 card in the FOH Master TT24. The second slot in the FOH TT24 can utilize any other card, such as the LP48. This allows both TT24s to use the inputs from the DS3232 and then both TT24s can feed their outputs to the DS3232 as well. This is accomplished via the routing pages. The terms FOH and Monitor are purely for convenience; the roles can be reversed and the snake can be connected to the FOH console if desired.



Linked TT24 FOH-Master and Monitor-Master with DS3232

This configuration could even be used with a conventional analog snake connected to one of the consoles. In addition, linked consoles at FOH and MON and two snake configurations can also be supported.

When the TT24s are linked in this fashion, the two will send signal between each other just as they send and receive signals to and from a DS3232. This is also done from the U-Net routing screens. Since the Monitor console is directly connected to the snake, the FOH console must route signal to the monitor console. The monitor engineer can then route that signal on to the snake as one of the 32 available channels using the U-Net and Output routing screens.

When linking consoles, either for the new FOH-MON linking or the existing FOH-FOH linking, you must configure the following new controls from the Setup>Linking screen:

ti centrel a	1.70 FOR HASTER				i 🗊 – 🔀
-	CH.1 Analog	EINK	Linking	Menu	Files
					10
	FOH MAST	CONSOLE LINK MOD	DE: TER MON SLAVE	)	
		LINKED CLOCK MOD	SLAVE	)	
۲		MIC PRE MODE: MASTER SLA		)	
		MIC PRE TRIM COMPEN	ISATE:	)	
	·			)	

- Console Link Mode This configures how the console behaves with other linked consoles. Only one can be selected at a time on any console.
  - FOH Master (Default)
  - MON Master
  - FOH Slave
  - MON Slave
- Linked Clock Mode This configures which unit will be used as the clock master when linked. Only one TT24 on a linked chain should be configured as Linked Clock Master. All other TT24s should be configured as clock slave. The clock master must still configure internal or external clock on the setup>digital page. This setting effectively sets the TT24 to the highest clock priority which will cause it to be chosen as the U-Net clock master by the U-Net clock negation. If more then one console is configured as master (or none are configured as Master), the system will automatically choose one using standard U-Net clock negotiation; this may lead to clocking issues or unexpected clocking behavior. By default this is set to Slave.
- Mic Pre Mode– This configures whether the console is master or slave for Mic Pre Gain Compensation. This only has an effect if consoles are connected to a DS3232. If only one console is connected to a snake, it should be set to Mic Pre Master. See the rest of this section for details on Gain Compensation. By default it is set to Master.
- Mic Pre Trim Compensate On/Off This configures whether the console is compensating for gain changes. Any combination of Mic Pre Masters or Slaves can be configured to compensate as desired. See the rest of this section for details on Gain Compensation. By default it is set to Off.

Note that if more then one console is configured for the same Console Link Mode on a network, then a U-Net Network error will occur.

Also, note that only one Clock master should be present, but many Clock slaves can be connected.

Note also that the Console Master Slave setting is no longer present on the setup operation screen as this is now configured on the new Setup>Linking screen described above.

### Setup – Operation Screen

E it control with	O FIDE MASTIN				. 8
-	CH.1 Analog	T LINK	Operation	Menu	Files"
		•			•
	Ċ				
		L/R + MONO LCR			
•		ANALOG DIGITA			
		ENABLE	Chreshold 0.0dB		
	C		.)		
e.					•

Note that the input DSP option is still available for backwards compatibility and convenience. The equivalent can now be achieved with much more flexibility by leaving the input DSP on the analog bank and changing the input routing as desired.

#### **Monitor Master U-Net Routing**

For this setup, the U-Net Routing Screens for the Monitor Master TT24 console are setup as follows, using the factory preset "MON Snake LP48."

E Baserie	A \$1.10 PT II NOT MANTER TO	<b>int</b>							
-	CH.1 Ana	log			LINK	UNetAB Routin	1gT	Menu	Files
-	UNU BLOTA R	100.00			-	Line such a 1	1.00	Doctor of the	1222
					1124	MON Master Out Aux	1	Post Fade	
100					TT24	WON Master Out Aux		Post Fade	
-					TT24	MON Master Out Aux		Post Fade	ete et
and the second					1124	MON Master Out Aux		Post Fade	
				8	TT24	MON Master Out Aux		Post Fade	
Sec.				9	1124	MON Master Out Aux	9	Post Fade	<b>1 1</b>
A DESCRIPTION OF				10	TT24	MON Master Out Aux	10	Post Fade	
and the second second				11	TT24	MON Master Out Aux	11	Post Fade	64 A
Sector Sector				12	TT24	MON Master Out Aux	12	Post Fade	E 8 1
TT24	FOH Master Out Group	1	Post Fader + +	13	TT24	FOH Master Out Group	1	Post Fade	10.0
TT24	FOH Master Out Group	2	Post Fader + +	14	TT24	FOH Master Out Group	2	Post Fade	10.0
TT24	FOH Master Out Group		Post Fader  =  -	11	TT24	FOH Master Out Group		Post Fade	10.0
<b>TT24</b>	FOH Master Out Group	4	Post Fader   -	16	1124	FOH Master Out Group	4	Post Fade	6 C . C
<b>TT24</b>	FOH Master Out Group	5	Post Fader = =	17	1124	FOH Master Out Group	5	Post Fade	10.0
TT24	FOH Master Out Group	6	Post Fader + +	18	TT24	FOH Master Out Group	6.	Post Fade	14.4
TT24	FOH Master Out Group	7	Post Fader E	19	T124	FOH Master Out Group	7	Post Fade	10.0
TT24	FOH Master Out Group		Post Fader 1 -	20	TT24	FOH Master Out Group	8	Post Fade	12.0
TT24	FOH Master Card B	9		21	TT24	FOH Master Card B	9		10
TT24	FOR Master Card B	10		22	TT24	FOH Master Card B	10		00
TT24	FOH Master Card B	11		23	11724	FOH Master Card B	11		10
1124	FOH Master Card B	12		24	TT24	FOH Master Card B	12		00
TT24	FOR Master Card B	25		25	TT24	FOH Master Card B	25		30
TT24	FOH Master   Card B	26		26	TT24	FOH Master Card B	26		
TT24	FOH Master Card B	27		27	1124	FOH Master Card B	27		
TT24	FOH Master Card B	28		21	TT24	FOH Master Card B	25		10.0
11724	FOH Master In Talkback	les les	Input a s	29	TT24	MON Master In Talkback	In	Input	00
TT24	FOH Master Out Main	L	Post Fader # -	3.0	TT24	FOH Master Out Main	L	Post Fade	6 H H -
TT24	FOH Master Out Main	R	Post Fader = =	31	TT24	FOH Master Out Main	R	Post Fade	C 4 1
TT24	FOH Master Out Main	C/M	Post Fader D P	312	1124	FOH Master Out Main	C.M	Post Fade	eta la 🔤

#### **U-Net AB Routing**

Card A is set to receive the FOH Group outputs, the FOH Card B outputs (such as from an LP48), FOH Talkback, and the FOH main outputs.

Card B is set to send the Mon Master Auxes, FOH Groups, Card B, Mon Talkback, FOH mains.

(i) the second fair	i ipini	NON MASTOR (D)	end -	1012 00						6
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Linked TT24 FOH-Master and Monitor-Master with DS3232

#### **U-Net BA Routing**

Card A is set to send along the DS3232 signals (to the FOH Master).

Card B is set to receive the DS3232 signals from the DS3232.

#### FOH Master U-Net Routing

For this setup, the U-Net Routing Screens for the FOH Master TT24 console are setup as follows, using the factory preset "MON Snake LP48."

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#### **U-Net AB Routing**

Card A is set to receive the DS3232 signals (via the TT24 Monitor Master).

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### U-Net BA Routing

Card A is set to send the FOH Master Group outputs (post fader) the Card B outputs (such as from an LP48), Talkback, and the main outputs.



Linked TT24 FOH-Master and Monitor-Master with DS3232

### 3.1 Gain Compensation

When FOH-MON linking, since both consoles will be using inputs from the same mic pre, it may be desirable to have gain changes made to the mic pre not affect the other console. This is done using the digital trim on one console to compensate for changes made to the gain from the other. For this to work, at least one console must be designated to actually control the mic pre by enabling Mic Pre Master on the Setup>Linking screen as described above.

Note: In the details below, the term "slave" and "master" refer to if the consoles are set to be a mic-pre slave or mic-pre master, not a FOH or Mon slave or a FOH or Mon master.

### Mic Pre Master

With a Mic Pre Master console and a Mic Pre Slave console connected to a DS3232, the micpre-master console has control of the Mic Pre gain, 48V, and Pad. The Trim V-Pot control shows Mic Pre gain on the channel V-Pots



### Mic Pre Slave

The mic-pre-slave console can display all true values of Mic Pre Gain, 48v, and Pad, but the Digital Trim is the only control that is adjustable. The Trim V-Pot control shows digital trim on the channel V-Pots.



### Mackie TT24 Digital Live Console Owner's Manual Addendum v1.7

When the mic-pre-master turns up or down the gain or adjusts the pad, the mic-pre-slave console with Mic Pre Gain Compensation enabled, automatically compensates by adjusting its digital trim. For instance, if the mic-pre-master turns up the mic pre gain by 5 dB, the mic-pre-slave's digital trim gets turned down 5 dB. This works fine once things are up and running, but it would be weird for initial setup; you may end up with some very strange settings on the mic-pre-slave trims during initial setup as all of the mic gains are being turned up. For this reason, the mic-pre-slave console can stop compensation during initial set up by disabling the "Trim Compensate" button. When compensating, the console Trim V-Pot control flashes when selected, and pressing the console Ctrl + TRIM toggles this selection.

Also, + or - 15 dB of trim might not be enough to compensate in all situations especially because the pad requires 23 dB of compensation, therefore, the digital trim which normally only allows +-15dB of trim control without a snake attached, changes to +-60 dB when a snake is attached. Note that if the mic-pre-slave needs to compensate with more than +-15 dB of digital trim, something is probably wrong in the gain structure somewhere.

Another complex issue arises when snapshots are used. Both the mic-pre-master and micpre-slave console need to be able to use snapshots to recall gain settings.

The mic-pre-master console actually controls the Mic Pre Controls, so it can store and recall these settings. Doing so will send the information to the mic-pre-slave console which will compensate for these snapshot induced changes, just as it does when you manually adjusts these parameters.

When the mic-pre-slave engineer recalls a snapshot, their goal is to have an absolute gain stored in the snapshot recalled and applied to the input. But, since the mic-pre-slave console cannot directly control the snake mic pres, it must calculate the compensated gain from the snapshot (stored mic pre gain + pad + stored digital trim), and then adjust the digital trim to achieve the same level of compensation with the current mic pre gain setting set by the mic-pre-master.

	Master	Slave Before	Slave Snapshot	Slave Recall
Gain	40 dB	Na	45 dB	Na
Pad	Out	Na	Out	Na
48v	Out	Na	Out	Na
Trim	0 dB	-10 dB	0 dB	5 dB
Compensated Gain	40 dB	30 dB	45 dB	45 dB

For example, let us assume the mic-pre-master and mic-pre-slave are configured as shown in the columns below:

The snake gain is set to 40 dB by the mic-pre-master console. The mic-pre-slave console engineer has adjusted the trim to -10 dB giving a compensated gain to 30 dB into the corresponding slave console channel. If the master were to increase the Gain in the snake, the mic-pre-slave would decrease the digital trim by the same amount. The mic-pre-slave snapshot (which could have been created when the console was a mic-pre-master or mic-pre-slave – see below) has 45 dB of compensated Gain through the mic pre and digital trim. Since the current state of the snake mic pre is 40 dB, to achieve 45 dB of compensated gain, the mic-pre-slave console must adjust the digital trim to 5 dB as shown in the Slave Recall column.

This allows snapshots to be shared between mic-pre-master and mic-pre-slave console and to allow the console to operate in either configuration while keeping their snapshots working properly. This is because when storing snapshots on the mic-pre-slave, the master gain, pad, 48v are stored in the snapshot along with the snake digital trim, so the snapshot is no different then that on a mic-pre-master console.

### 4.0 Appendix Ramblings: Front of House and Monitor Mixer Utilizing a Snake

In larger venues, a separate front of house and monitor console are used. In an all-analog world, the inputs from stage are sent to both the front of house and monitor console by using a splitter snake. Each console then receives the signal and each engineer has an independent mic pre for the same input signal. This is easy to use but the engineers must deal with extremely long and heavy cable runs making set up/tear down and audio quality an issue.

In a digital world, a digital snake is often used to convert the signal to digital and send it to each console over a light weight digital connection. This also improves audio quality since there is no signal loss over the long distance.

### Shared I/O from a Single Analog Snake

A splitter snake can be rendered unnecessary if the two digital consoles used at FOH and Monitor can pass signal between them digitally. If this is the case, only one of the two consoles needs to be connected to the analog snake and it can pass these signals (or any other for that matter) on to the other remote console. Effectively, the console and digital connection are acting as a splitter snake. The remote console can also use the digital connection to send outputs back to the console connected to the snake, which can then route the analog outputs back to the snake. Thus either console can receive inputs from and send outputs to the analog snake.

### Shared Mic Pres from a Single Digital Snake

The digital snake solution is not always perfect, especially in a scenario where FOH and Monitor desks are connected to the same snake. Only a single mic pre is used and it is instead positioned in the flow before the signal is sent to both consoles. Thus the engineers don't have independent control of the mic pre, as changing the gain from one console will affect the other. This can create havoc. For instance, if the monitor engineer were to reduce the gain of the lead vocalists mic pre because they are getting feedback with the monitors, this would lower the level of the vocalist at FOH making it hard for the audience to hear them.

To remove the symptoms of this problem, adjusting the gain from one console should not affect the other consoles gain structure, and vice versa. Engineers have come to expect this "gain compensation" when working with digital desks sharing a digital snake. This often done by designating one console a master and the other a slave.

### Shared Outputs from a Single Digital Snake

On the opposite side of things, the two consoles must be able to both feed signals to the single digital snake with a fixed number of outputs. Each engineer must be able to send signals to the snake for patching to amps/active speakers.

### Snapshot Recall of Mic Pre Parameters

Because the mic pre parameters can be stored and recalled via snapshots, this can cause some problems with sharing the mic pre. Ultimately, the users of both consoles want to be able to store and recall snapshots with gain changes and want changes made from one to not affect the other.

### Features of the 1.7 upgrade

- Two consoles can share the input signals from a single analog or digital snake
- Gain Compensation allows two consoles sharing the same mic pre from a digital snake to have apparently independent control of their gain structure by using a master/slave structure.
- When the master console recalls a snapshot with gain changes, the slave console can compensate.
- When the slave console recalls a snapshot with gain changes, the master console is unaffected.

## **Recording at Front of House**

In today's live sound environment, the need to record shows off the front of house desk is becoming increasingly important. This is especially true at churches and other fixed installs which may need to deliver a variety of different performances to a variety of different recording and broadcast mediums.

### Stereo Recording

The most simple delivery medium is a stereo recording to CD. This is commonly done straight off the LR mix buss with the exact same signal and level. It would be more beneficial if this stereo mix could be at a slightly different level allowing you to hit the CD converters as loud as possible to achieve the best possible SNR. In an advanced scenario, the engineer may wish to use a different combination of levels from each channel for recording than is used at FOH. Finally, in addition to creating a different mix of levels for recording, the engineer would ideally like to have a different set of DSP available for the recording mix essentially having a completely different mix for recording than for the live output.

### Multi Track Recording

If an engineer doesn't have the time to make a perfect recording mix, or wants to endlessly perfect the recording mix after the fact, then they may choose to record individual inputs or groups of inputs onto a multi track device. Sometimes they may choose to record the inputs without any processing, completely independent of the main mix they are doing for the live show. Other times they may wish to use the process signals for the recording. Either way, the recording process should require very little attention during the show. When the show is complete and they are comfortably in their mixing studio, they can take the time to create the perfect mix.

#### Features of the 1.7 upgrade

- A console can route any output signal to any physical output or outputs
- A console can route any physical input signal to any input channel or channels
- A console can route any input channel's pre-DSP or post-DSP signal to any physical output or outputs
- A console can route any output channel's pre-DSP or post-DSP signal to any physical output or outputs

### Front of house and monitor mixing from the same mixer

Many users don't require a separate monitor console and front of house console. This means that they must mix both from the same console.

### Separate Channels for FOH and Monitor

Users with enough input channels may want to use a separate channel for FOH and Monitor mixing. This essentially gives them the benefit of two mixers in one.

### Features of the 1.7 upgrade

• A console can route any physical input signal to any input channel or channels



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