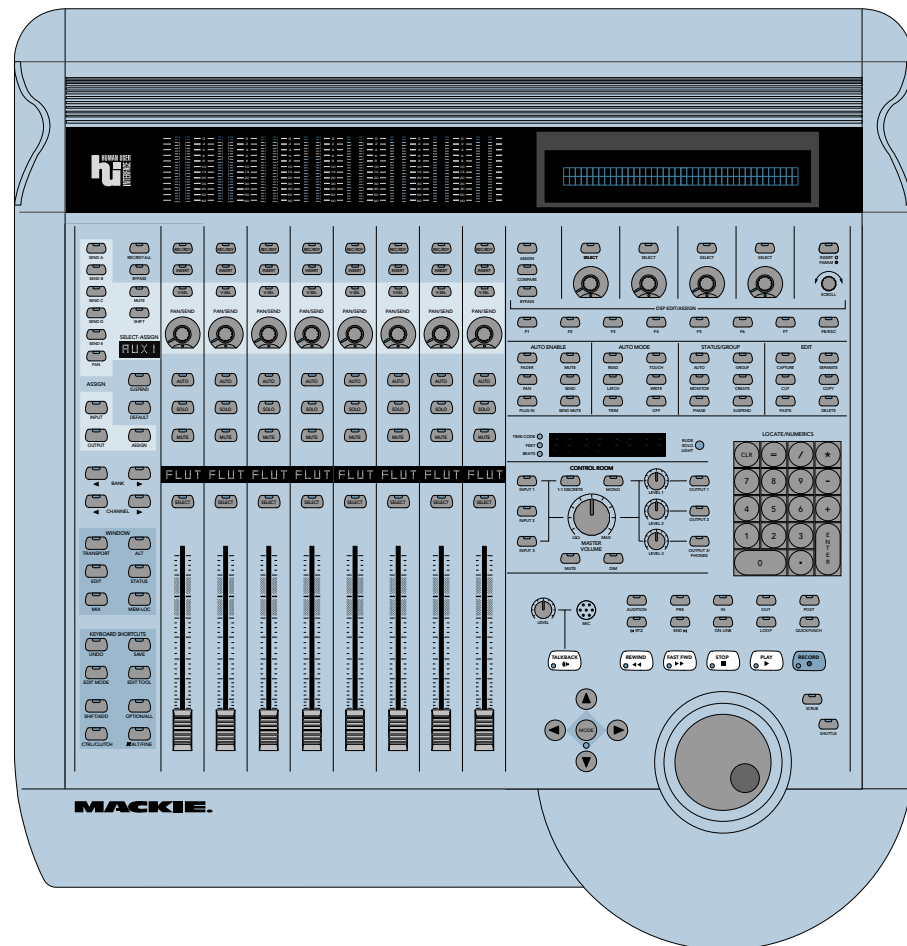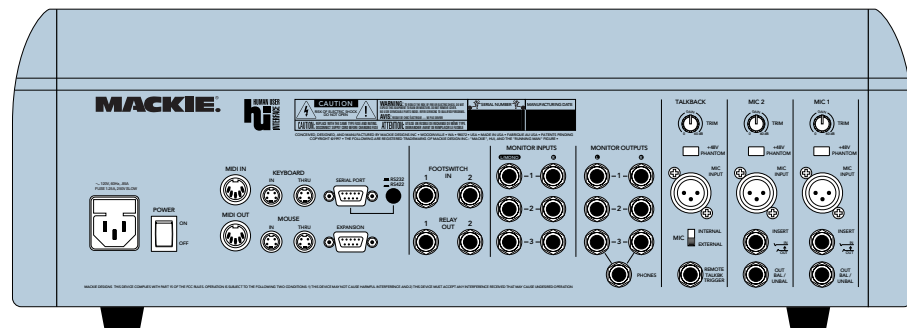# HUI™

Human User Interface for Digital Audio Workstations

Reference Guide

SAFETY INFORMATION

```
         CAUTION   AVIS
       RISK OF ELECTRIC SHOCK
            DO NOT OPEN
      RISQUE DE CHOC ELECTRIQUE
            NE PAS OUVRIR
```

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED PERSONNEL
*ATTENTION: POUR EVITER LES RISQUES DE CHOC
ELECTRIQUE, NE PAS ENLEVER LE COUVERCLE. AUCUN
ENTRETIEN DE PIECES INTERIEURES PAR L'USAGER. CONFIER
L'ENTRETIEN AU PERSONNEL QUALIFIE.
AVIS: POUR EVITER LES RISQUES D'INCENDIE OU
D'ELECTROCUTION, N'EXPOSEZ PAS CET ARTICLE
A LA PLUIE OU A L'HUMIDITE*

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to persons.
Le symbole éclair avec pointe de flèche à l'intérieur d'un triangle équilatéral est utilisé pour alerter l'utilisateur de la présence à l'intérieur du coffret de "voltage dangereux" non isolé d'ampleur suffisante pour constituer un risque d'éléctrocution.

The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.
Le point d'exclamation à l'intérieur d'un triangle équilatéral est employé pour alerter les utilisateurs de la présence d'instructions importantes pour le fonctionnement et l'entretien (service) dans le livret d'instruction accompagnant l'appareil.

SAFETY INSTRUCTIONS

1. Read Instructions — Read all the safety and operation instructions before operating HUI.

2. Retain Instructions — Keep the safety and operating instructions for future reference.

3. Heed Warnings — Follow all warnings on HUI and in these operating instructions.

4. Follow Instructions — Follow all operating and other instructions.

5. Water and Moisture — Do not use HUI near water — for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, in the rain, near a swimming pool, or next to a sweat-gushing, 300-lb. drummer, etc.

6. Heat — Locate HUI away from heat sources such as radiators, compost pits, or other devices that produce heat.

7. Power Sources — Connect HUI only to a power supply of the type described in these operation instructions or as marked on HUI.

8. Power Cord Protection — Route power supply cords so that they are not likely to be walked upon or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit HUI.

9. Object and Liquid Entry — Do not drop objects or spill liquids into HUI.

10. Damage Requiring Service — HUI should be serviced only by qualified service personnel when:

   A. HUI power-supply cord or the plug has been damaged; or

   B. Objects have fallen onto, or liquid has spilled into HUI; or

   C. HUI has been exposed to rain; or

   D. HUI does not appear to operate or exhibits a marked change in performance; or

   E. HUI has been dropped, or its chassis damaged.

11. Servicing — Do not attempt to service HUI beyond those means described in this operating manual. All other servicing should be referred to the Mackie Tech Support Department.

12. To prevent electric shock, do not use HUI polarized plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

Pour préevenir les chocs électriques ne pas utiliser cette fiche polariseé avec un prolongateur, un prise de courant ou une autre sortie de courant, sauf si les lames peuvent être insérées à fond sans laisser aucune pariie à découvert.

13. Grounding or Polarization — Do not defeat the grounding or polarization of HUI.

This apparatus does not exceed the Class A/Class B (whichever is applicable) limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

ATTENTION —Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de class A/de class B (selon le cas) prescrites dans le règlement sur le brouillage radioélectrique édicté par les ministere des communications du Canada.

FCC Information

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE

This product has been tested and complies with the following standards and directives as set forth by the European Union:
- EN 55022   Radiated and Conducted Emissions
- EN 61000-4-2   Electrostatic Discharge Immunity
- EN 61000-4-3   RF Electromagnetic Fields Immunity
- EN 61000-4-4   Electrical Fast Transient/Burst Immunity
- EN 60950/IEC 950 Electrical Safety Requirements

WARNING — To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.

INTRODUCTION

Welcome!

Of course we know what you want to do now. You want to bypass this reference guide completely and get right into the business of firing up your new HUI™. And who wouldn't? So, congratulations. You bought yourself a HUI!

Mackie Designs' HUI — Human User Interface — will make life with your digital audio workstation (DAW) the sweet dream it was always meant to be. You've always imagined being able to use your digital audio workstation the way you use those old analog mixing consoles, but with the modern enhancements of digital technology. Now you can.

But before we break on through to the other side of this page we'd like you to do a few things:

1. Write down the serial number of your HUI in the box prepared especially for you on this page. Keep in mind one of the corollaries to Murphy's Law: The very act of writing down the serial number means you'll never need to use it. See? We're doing you a favor.

2. Check out the "Read Me" file with your DAW software disks, or any additional inserts that come with HUI. They'll contain the latest information about using your HUI, including software updates, tips and tricks to help you use it more efficiently, and any other last-minute changes or addenda to this reference guide.

3. Save the box and all the foam innards. Though we expect you'll never have to send in your HUI for service (see #1 above), should the occasion arise you don't want to be caught with your pants down. Likewise, we don't want to have to sell you new pants (that is, a new box and innards) to get you through the ordeal.

4. If you can't force yourself to read this blessedly short reference guide before digging in, at least read through the Quick Start section on pages 8 and 9. This shows you how to connect HUI into your system, so you're ready to boldly go where your DAW has only hinted.

Now there's just one more thing before we begin…

What This Manual Will Do For You — And What It Won't

This reference guide is designed to help you understand the specific features and controls of Mackie's HUI. Since HUI is designed to control a wide variety of DAWs, including Digidesign® Pro Tools®, you will want to consult the proper manual from your particular DAW manufacturer to understand what each command and control can do. For example, *Pro Tools users should look in Digidesign's* **MIDI Controller's Guide**, *or their Pro Tools owner's manual for specific information on how HUI works with Pro Tools.*

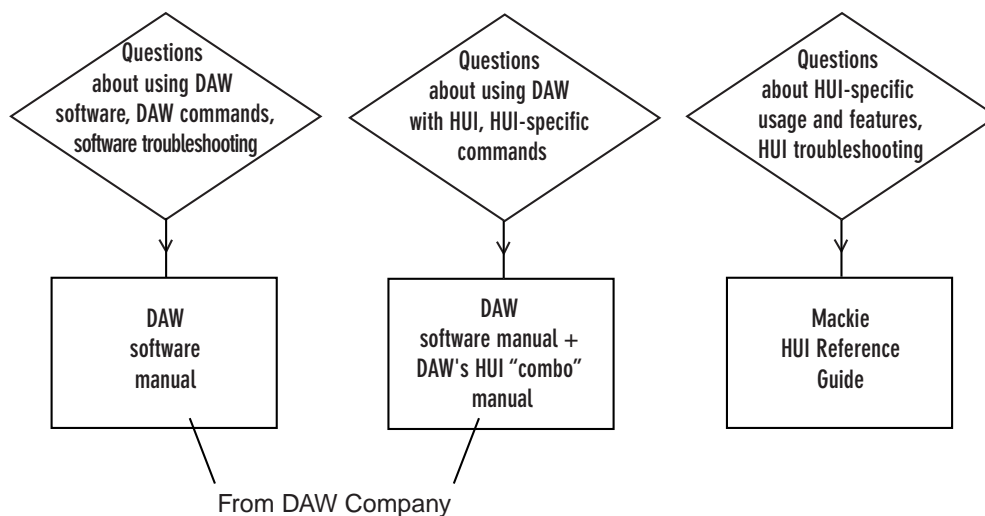See the diagram on the next page — it describes which manual to use and when.

Please write your serial number here for future reference (i.e., insurance claims, tech support, return authorization, etc.):

Purchased at:

Date of purchase:

Here's a flowchart that shows when to use your DAW manufacturer's software manual, when to use their "combination" manual (Digidesign calls theirs the *MIDI Controller's Guide*), and when to use this HUI Reference Guide.

```
  ╱─────────────╲          ╱─────────────╲          ╱─────────────╲
 ╱   Questions    ╲       ╱   Questions    ╲       ╱   Questions    ╲
╱  about using DAW  ╲    ╱  about using DAW  ╲    ╱  about HUI-specific ╲
╲ software, DAW commands, ╱  ╲ with HUI, HUI-specific ╱  ╲ usage and features, ╱
 ╲ software troubleshooting ╱    ╲   commands     ╱    ╲  HUI troubleshooting ╱
  ╲─────────────╱          ╲─────────────╱          ╲─────────────╱
        │                        │                        │
        ▼                        ▼                        ▼
┌─────────────┐          ┌─────────────┐          ┌─────────────┐
│             │          │    DAW      │          │             │
│    DAW      │          │ software manual + │    │   Mackie    │
│  software   │          │ DAW's HUI "combo" │    │ HUI Reference │
│   manual    │          │   manual    │          │    Guide    │
│             │          │             │          │             │
└─────────────┘          └─────────────┘          └─────────────┘
```

From DAW Company

QUICK START ALERT!

Can't wait to get started? If you're one of those people who just can't wait to plug in and turn on that *new electronic thingie*, at least turn to page 8 and read the Quick Start Section first! We trust you'll get to the rest of the manual in due time.
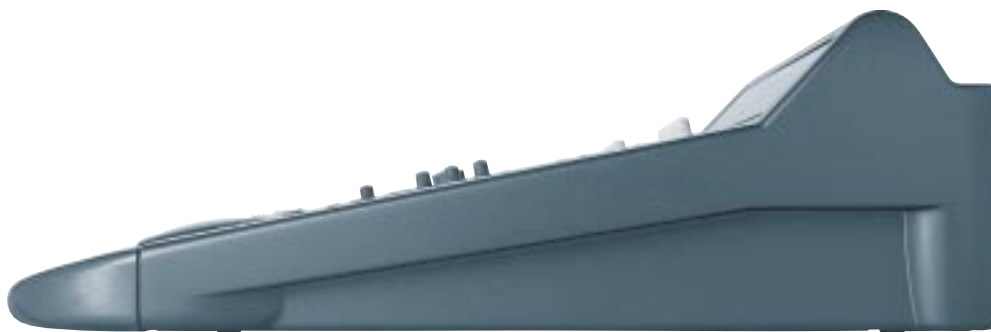
CONTENTS

INTENDED USE — WHY HUI?

Take a look at HUI. Lots of buttons, a few funny-looking knobs, some faders, and a big ol' jog wheel. If you didn't know any better you'd think you'd run across some sort of supersonic audio mixer. You have — sort of. But HUI is more than that.

First of all, HUI was designed to work with digital audio workstations (or DAWs). For purposes of illustration we're using the Digidesign® Pro Tools® 4.1 audio hardware/software package (eventually other DAWs will be compatible with HUI). As you may well be aware, Pro Tools allows you to record, edit, mix, and play back audio in the digital realm. You can make seamless electronic edits, EQ changes — basically anything you'd do in a recording studio — without affecting the original source material. With your DAW you can try out infinite possibilities, save practically infinite versions, and then spend the rest of your known existence trying to decide

take multiple mouse-clicks and key combinations can now be accomplished with the push of a button or two. You can use HUI's hands-on controls to do everything from recording a single track to grouping multiple tracks, assigning inserts and aux sends/returns, automating mixes, and mixing programs for surround-sound.

Touch-updatable moving faders, V-Pots, electronic "scribble strips," a 40 by two-character display, built-in meter bridge, and an ergonomically laid-out control surface make HUI the logical choice for returning analog-style control to your digital world.

The built-in control room section provides a convenient way to monitor your mixes without having to use a separate mixer. It has three stereo inputs and three stereo outputs, plus a headphone output. The monitor inputs can be mixed together, or they can remain discrete, direct assigned to their corresponding monitor outputs.

which one was the best. If you make your living recording and mixing audio for CD, major motion picture soundtracks, TV/radio audio soundtracks, or multimedia, a DAW is manna from heaven.

But — and this is a big but — using a mouse and computer keyboard to do things you used to do on an analog mixer can be very strange. Clicking on a visual representation of a fader and trying to drag the mouse smoothly in order to achieve an amazing fade-out is difficult, if not impossible, for many of us. Likewise, turning a "virtual knob" on a computer screen just doesn't cut it for some folks. And that's why Mackie Designs teamed up with Digidesign to create HUI.

HUI gives you hands-on control of all of your DAW's parameters. Now you can create a fade with a real fader. Move a HUI fader and your DAW "makes note" of your action and mirrors it on the computer screen. Similarly, when you make a fader move on your screen, HUI's fader moves, too. Adjust EQ by turning one of HUI's V-Pot™ knobs and the DAW takes care of the rest. In fact, mouse-clicking is practically a thing of the past — with HUI, what used to

For additional tracking capability, we added two of our handy studio grade microphone preamps for direct analog connection to your digital audio interface's A/D converters. These mic pre's are the same design as those on our large format recording consoles, and offer plenty of gain, insert patching, and phantom power for condenser mics. You can use them for recording any sound source with low noise, low distortion, and wide frequency response. To top it off, we added a third mic preamp for a remote producer talkback mic or slating capabilities.

You can do so much with HUI. It's a mix control surface that sets new levels of interactivity within today's and tomorrow's DAW environments — it will grow with your system, DAW software upgrades, etc. HUI can greatly improve your creativity while diminishing your workload and the repetitive grind of multiple sessions.

HUI Does What Your DAW Does

Though HUI can do many things, there are some things it cannot do. If your DAW software can't do a particular magic audio trick you've always wished for, neither can HUI*. Because HUI works along with your DAW — thanks to the software and MIDI instructions that go back and forth between HUI and your computer — it is at your software's mercy. This is a good thing, though. If your DAW software is updated with new features or what have you, HUI can keep up with the technology. So, though your software may change, HUI will stay the same. It'll let you control your DAW with the hands-on ease and intuition you expect. It lets you be as creative as you want to be.

One caveat: Some DAW software packages accept third party plug-ins. It's up to the plug-in designer to insure that their plug-in works correctly with external controllers like HUI.

HUI SELF-DEMO

Perform the Self-Demo (Optional)

Before you go all the way and connect HUI in your studio, you can perform this self-demo to make sure it lights up and works properly, and to get an idea of what HUI can do.

We're new-technology fiends just like you are — we know you want to impress people with your wise purchase. So set up your HUI on a tabletop or other such eye-level resting place and call in the kids, the other studio engineers, or anyone within shouting distance. We're going to plug it in, turn it on, and MAKE IT LIGHT UP!

Just follow these simple directions, okay?

1. With HUI out of the box and propped up for all to admire, grab the power cord and plug it in. (Don't turn it on yet.) We recommend using a UPS or circuit-protected outlet strip like the kind you use with your computer or other audio hardware.

2. Turn on HUI by pressing the rocker **POWER** switch on the rear panel.

3. Within three seconds after turning on the power, simultaneously press the **CTRL** and **ALT** buttons (located in the "Keyboard Shortcuts" section at the lower left area of HUI's front panel). The self-demo begins, and will continue as long as HUI is powered up.

Note: You can quit the self-demo at any time by simply turning off HUI's POWER *switch.*

An Installation Note

HUI has conductive knobs on the faders that can "sense" when you touch them and toggle the "Write" mode for those channels automatically. Furthermore, as soon as you let go of the knob, the channel goes back into playback mode, playing back whatever automation had been previously recorded.

The touch circuits operate by sensing the stray capacitance your body provides between the fader knobs and ground. There are a number of variables that can affect the operation of this circuit, including temperature, humidity, and the number of fader knobs touched.

Reliable operation of the touch circuits depends on providing a good earth ground for the HUI. Be sure the power cord is plugged into a 3-prong outlet with the third pin (safety pin) connected to earth ground. If you're not sure whether the third pin is grounded, use an AC outlet circuit tester to verify that the outlet is properly configured (available from Radio Shack and many fine hardware stores). **DO NOT BYPASS THE SAFETY PIN ON THE PLUG.**

---

* That's why we didn't name it "Harry HUIdini."

QUICK START

Okay, okay… let's run some audio through HUI's monitor section. If you already performed the self-demo, then you know the faders work. The next logical stage is to make sure that HUI works with audio connected, and with your DAW.

Quick Start Audio Test

The diagram below shows the simple audio connections you'll need to make for the audio quick start.

1. With HUI's *power turned off*, plug in one of the following:

- A pair of powered studio monitors to **MONITOR OUTPUTS 1** on HUI's rear panel; or…

- A pair of speakers (via a power amp) to **MONITOR OUTPUTS 1** on HUI's rear panel; or…

- At the very least, a pair of headphones. You'll plug these into — wonder of all wonders — the **HEADPHONES** jack on HUI's rear panel.

Now you can hear what's happening.

2. Connect the output of a stereo audio source (e.g., tape deck or CD player) to the **L/R MONITOR INPUTS 1**.

3. Make sure the front panel **MASTER VOLUME** and **LEVEL** knobs are off or turned down.

4. Power up HUI by pressing the **POWER** switch on the rear panel.

5. On HUI's front panel, make sure the **INPUT 1**, **OUTPUT 1** and **OUTPUT 3** buttons are pressed. They're in the **CONTROL ROOM** section; their LEDs will light up. (Be sure the **1:1 DISCRETE** switch is off.)

6. Turn up the **MASTER VOLUME** knob, the **LEVEL 1** knob, and the **LEVEL 3** knob enough to hear sound coming from the speakers and headphones.

7. Set the **TALKBACK MIC** switch on the rear panel to the **INTERNAL** position. With the **TALKBACK LEVEL** knob all the way down, press and hold the **TALKBACK** button, and slowly turn the **TALKBACK LEVEL** knob up until you can hear yourself talk in the headphones.

Note: TALKBACK is only assigned to OUTPUT 3/PHONES from the factory. You can assign TALKBACK to any of the OUTPUTS (see instructions under "Talkback Section" on page 13).

8. Repatch the audio source into various inputs and turn on the various front panel input and output switches accordingly. As a precaution, turn down the **MASTER VOLUME** control while repatching cables. You're now checking all of the various input and output combinations.

More information on HUI inputs and outputs can be found in the "Audio Input and Output" section, which begins on page 17.

If you suspect a problem with the HUI, turn to the "Troubleshooting" section beginning on page 25 and run the self-test.

Tape Deck or CD Player

Headphones

Powered Monitors
such as Mackie HR824s
(or connect to a power amp
connected to a set of speakers)
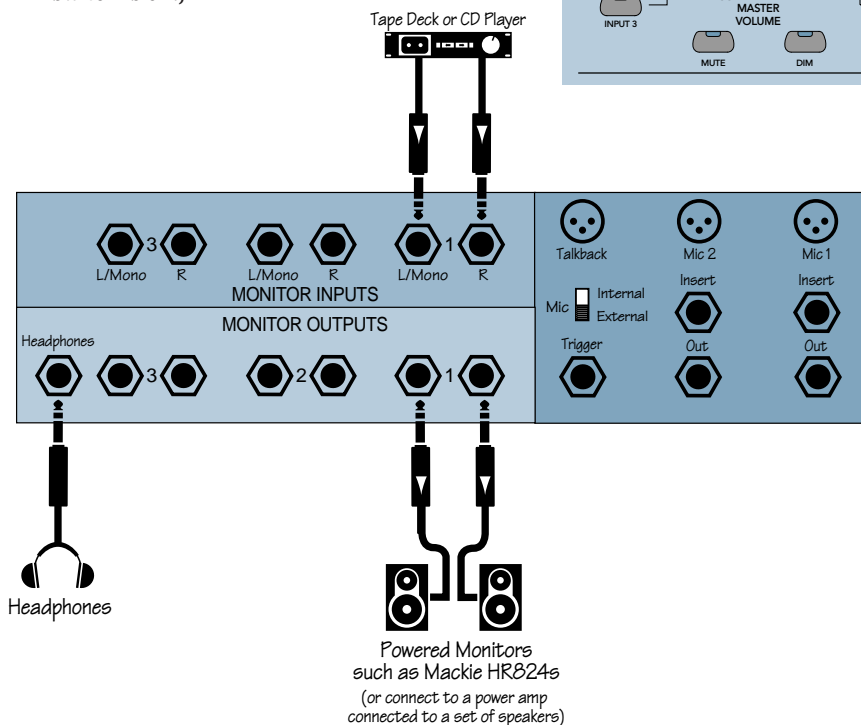
Quick Start DAW Controller Test

In order to make sure HUI is working in conjunction with your DAW, we'll perform the next test. However, a few things need to be set properly in your system software on your computer:

- Hook up your computer to HUI as shown in the diagram below.

- Make sure you have OMS (Open Music System) installed (or whatever MIDI software is compatible with your DAW), active, and properly configured on your computer.

- Make sure HUI is defined as a device in your OMS setup (be sure the proper port, channels, etc., are selected).

Note: Consult your software manual (or OMS literature) for the specifics on the above-mentioned OMS-related steps.

- Make sure the interface hardware is turned on, and the MIDI cables are properly routed in and out according to the port configurations defined in the MIDI system software (i.e., OMS).

- **Pro Tools Users:** Make sure the HUI "personality file" is placed in the DAE controller folder in your System folder, and check the *Pro Tools MIDI Controller's Guide* for information on OMS setup.

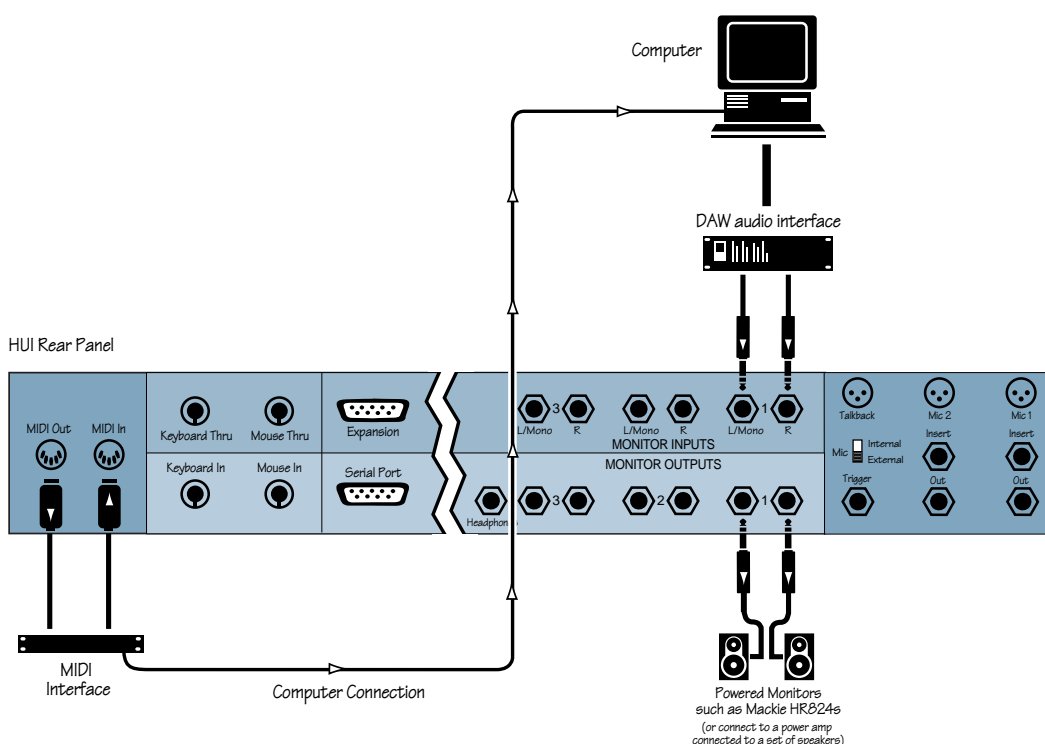- Make sure HUI is defined as a MIDI controller peripheral in your DAW software.

Next:

1. Run a pair of audio cables from your DAW audio interface's outputs to HUI's **MONITOR INPUTS 1** (L & R). The plugs on these cables will depend on what type of jacks (1/4″, RCA, XLR) you have on your DAW audio interface or sound card; the HUI ends of these cables should be 1/4″ TRS plugs (TS are okay).

2. You'll need a previously-recorded session to demo. Chances are you've either already recorded some sessions with your DAW and can use one of those. If you have no session to call your own, the software CD-ROM should have a sample session for you to use.

With all the above connections made and your DAW turned on:

3. Switch on HUI with the **POWER** switch on the rear panel. Turn on the power amps or powered monitors last.

4. Start your DAW application.

5. As soon as HUI is defined as a peripheral, MIDI active sensing is enabled and HUI begins displaying time code. This is a good thing.

6. Press HUI's **PLAY** button. (You could also click on PLAY on your computer screen, but since we're testing HUI…). The time code will change, indicating success.

7. Enable the control room inputs and outputs, turn up the volume, and dance to the music.

Computer

DAW audio interface

HUI Rear Panel

MIDI Out   MIDI In   Keyboard Thru   Mouse Thru   Expansion

Keyboard In   Mouse In   Serial Port

3   L/Mono   R   L/Mono   R   L/Mono   1   R
MONITOR INPUTS

Talkback   Mic 2 Insert   Mic 1 Insert

Mic   Internal   External

Headphone   3   2   1   MONITOR OUTPUTS   Trigger   Out   Out

MIDI Interface

Computer Connection

Powered Monitors
such as Mackie HR824s
(or connect to a power amp
connected to a set of speakers)

HUI FEATURES AND CONTROLS

Front Panel (Control Surface)

Channel Strip

NOTE: The functions of some of these switches depend on your particular DAW software. Therefore, you may wish to consult your DAW manual for further details.

① **Rec/Rdy (Record/Ready) switch.** This switch arms or disables the channel for recording.

② **Insert switch.** This switch calls up inserts for editing, and also allows you to bypass all inserts on the channel when the master **BYPASS** switch is pressed (see ⑬ at right). Makes it easy to access DSP (digital signal processing) software additions. (In Pro Tools these are called Plug-Ins.)

③ **V-Sel switch.** This switch toggles between the various functions of the V-Pot, such as I/O routing assignment, Send Mute switching (when the master **MUTE** switch is engaged), and Select when applying the default function.

④ **Pan/Send V-Pot™.** This "soft" potentiometer is used to adjust the send level and pan, to choose items from scrollable I/O assignment lists, and to determine destinations for sends.

⑤ **Auto switch.** For enabling automation on the channel.

⑥ **Solo switch.** For isolating a channel's signal.

⑦ **Mute switch.** For defeating the track's signal.

⑧ **Scribble strip.** A four-character LED dot-matrix display for the channel's name, group membership status, input and output source for the channel, send and insert status, and pre/post status display for sends. Names are entered in the DAW software.

⑨ **Select switch.** This switch is used to choose a channel for channel-based editing or assignment commands, such as groups, assignment, etc.

⑩ **Touch-sensitive motor faders**. These 100mm faders are for controlling the channel's levels, aux returns, MIDI track, and master fader levels. The eight faders move relative to the activity of the currently chosen bank of on-screen faders.
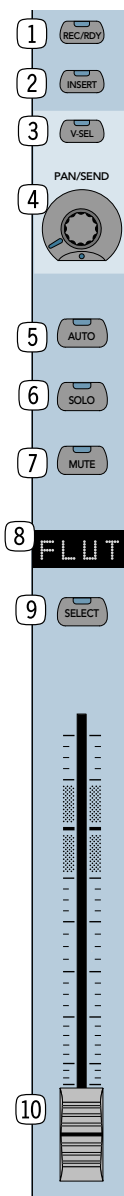
⑪ **Dual LED ladders.** *(Not shown here.)* Display mono or stereo audio levels, according to the DAW specifications. The Clip LED comes on at 0dBFS.

For Pro Tools users: When a channel is designated as mono, only the left meter ladder lights up. Likewise, if the channel is being used as a stereo channel, both ladders operate. (These meters are located in the meter bridge directly above each channel strip.)

Left Control Strip

⑫ **Rec/Rdy All switch.** This switch is used to enable (or defeat) all tracks for recording.

⑬ **Bypass switch.** This switch allows you to bypass any channel inserts (hardware or DSP Plug-Ins) on any HUI channel(s) you have selected.

⑭ **Select/Assign switches and scribble strip.** These switches are used to globally determine what a track's V-Pot will control. Included in this section are: SENDS A–E, PAN, MUTE, and SHIFT. The scribble strip shows what the V-POT is doing, as well as send destination and I/O routing of an individual channel strip.

⑮ **Suspend/Default switches.** SUSPEND temporarily suspends all automation functions (globally). DEFAULT is used to set selected channel(s) back to the original, default settings. Use the DEFAULT/SELECT ⑨ switches to reset faders, and the DEFAULT/V-SEL ③ switches to reset sends and pans.

⑯ **Input/Output/Assign switches.** These switches are used for signal routing assignment(s). By selecting combinations of these switches and the **SELECT** and **V-SEL** switches, channel I/O and send (bus) I/O assignments are made.
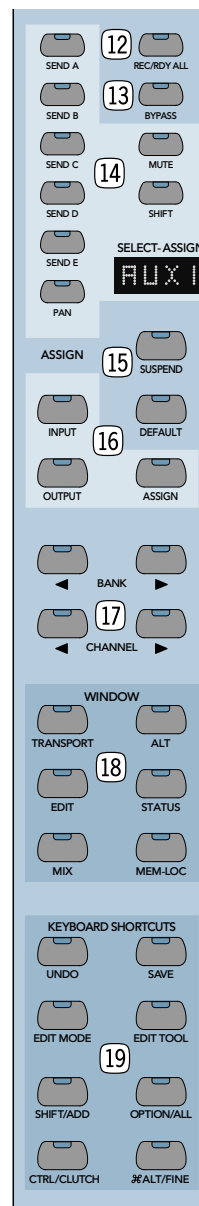
⑰ **Channel/Bank select switches.** Scroll switches to move back and forth across fader channels on the DAW mixing window. CHANNEL scrolls one channel at a time, BANK scrolls eight channels at a time.

⑱ **Window switch matrix.** These switches allow you to select various DAW windows. Pressing any switch will bring that window to the foreground on your computer screen.

⑲ **Keyboard Shortcuts switch matrix.** The four upper switches match other shortcut or software menu modes in your DAW, while the four lower "alternate function" switches emulate their computer keyboard counterparts.

DSP Edit/Assign Section

NOTE: The functions of some of these switches depend on your particular DAW software. Therefore, you may want to consult your DAW manual for further details.

① **40 x 2 VFD display.** Located in the meter bridge, this 40-character wide by 2-line VFD (vacuum fluorescent display) shows up to four Plug-Ins or up to eight Plug-In parameters. The VFD is also used to display general HUI info.

Note: You can adjust the brightness of the VFD by pressing and holding the OPT/ALL switch and repeatedly pressing the INSERT/ PARAM switch. This toggles among four levels of brightness.

② **Assign/Compare/Bypass switches.** The ASSIGN switch allows you to assign a DSP addition (or Plug-In) to a channel strip; COMPARE allows you to compare the current DSP parameter setting with the previous one; and BYPASS allows you to bypass DSP parameters or any DSP additions assigned to the channel, as applicable.

③ **Insert/Param(eter) switch.** Allows you to toggle the VFD between the DSP addition assigned to a particular insert, or the DSP addition parameters (for editing).

④ **Scroll control.** Used in conjunction with the INSERT/PARAM switch, it either toggles the VFD between Inserts 1-4 and Insert 5, or scrolls through control parameter pages for the currently active DSP addition.

⑤ **Select switch and V-Pot™.** These V-Pots and Select switches allow you to assign Plug-Ins and edit Plug-In parameters corresponding to the VFD and software screen displays.
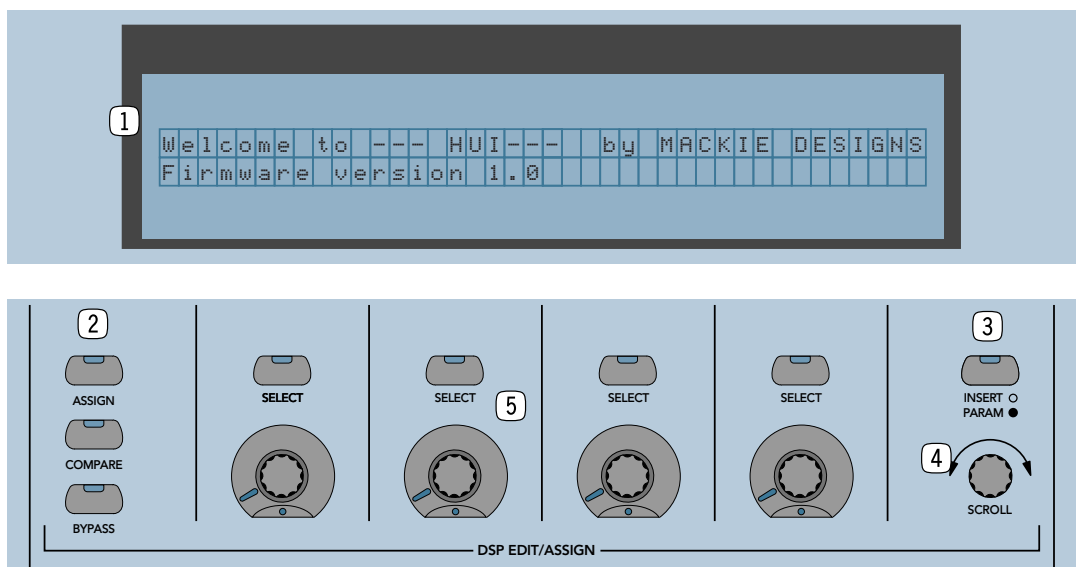
Switch Matrix Section

NOTE: The functions of some of these switches depend on your particular DAW software. Therefore, you may want to consult your DAW manual for further details.

This section contains switches for global automation enabling, mode selection, group creation, and more.

① **Function ("F") keys.** These keys provide a number of special functions relating to the operation of the HUI. Refer to the table on page 31 in the "Specifications" section for details.

② **Auto Enable switches.** These switches globally enable automation for FADER, MUTE, PAN, SEND, PLUG IN, and SEND MUTE.

③ **Auto Mode switches.** These switches arm (or disable) automation on individual channels or channel groups. Options are READ, TOUCH, LATCH, WRITE, TRIM, and OFF.

④ **Status/Group switches.** These switches are used to query automation, monitor, and group status, and to create and change groups. They include AUTO, GROUP, MONITOR, CREATE, PHASE, and SUSPEND.

⑤ **Edit switches.** These switches perform standard editing functions, including CAPTURE, SEPARATE, CUT, COPY, PASTE, and DELETE.

⑥ **Time Code Display and mode LEDs.** Shows current time location in either time code, feet, or beats. LEDs indicate which mode is being displayed. If no LED is lit, the display is in standard minutes/seconds mode.

Note: Once communication is established between HUI and the DAW software, the decimal point in the lower right corner of the Time Code Display blinks (once per second). If incoming MIDI communication is disrupted for any reason, the Time Code Display will read "Off Line."

⑦ **Rude Solo Light.** A gentle reminder that a channel (or channels) in your mix session is soloed, whether it's part of the current bank of eight channels or not.

⑧ **Locate/Numerics keypad.** Equivalent to its computer keyboard counterpart.

Control Room Section

The features found in this parcel of real estate *(pictured on the next page)* were included to let you use HUI without having to dedicate a mixer to monitoring functions. You can control input and output sources, as well as master volume, from this section. With the talkback features you can slate takes or talk to the voice talent, either with the in-panel talkback mic or with an external mic plugged into HUI's backside. We're sure you'll find these features quite useful in your daily DAW work. (See page 18 for more info.)
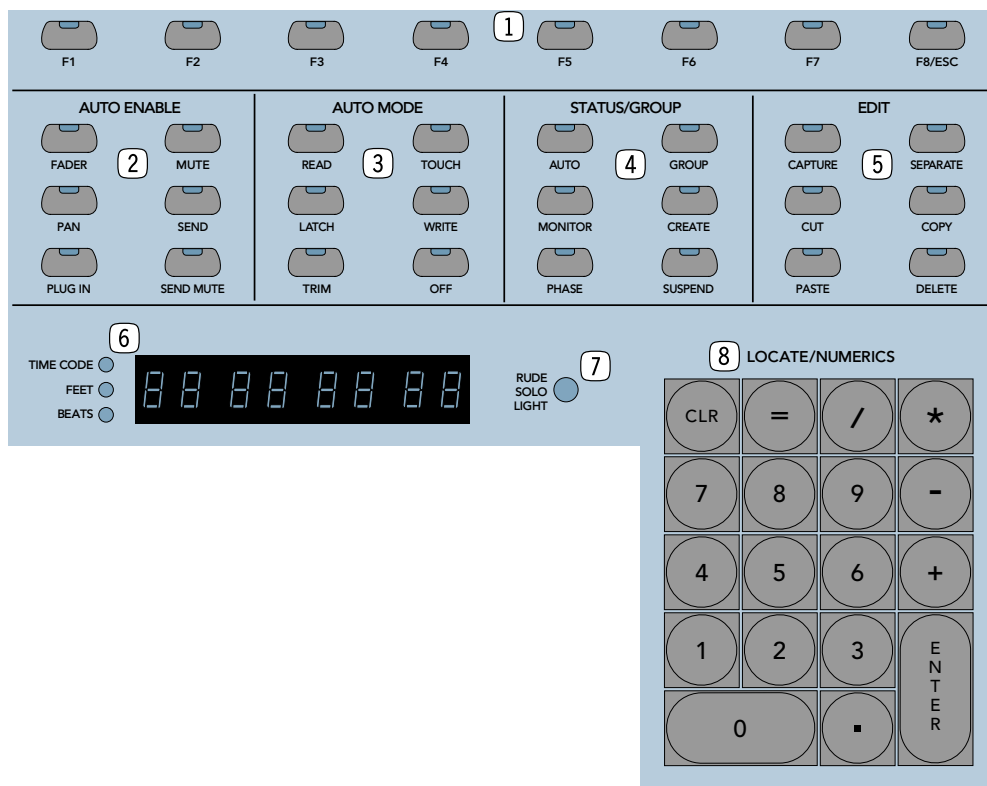
① **Input source select switches.** These switches allow you to monitor whichever stereo input sources you have selected. Labeled IN-PUT 1, INPUT 2, and INPUT 3, they correspond to the MONITOR INPUTS 1, 2, and 3 jacks on HUI's rear panel.

② **1:1 Discrete switch.** This switch determines whether HUI's inputs act as three stereo pairs assignable to any stereo output, or as six discrete mono inputs assigned to their corresponding outputs only (used for surround-sound mixing).

③ **Mono switch.** When this switch is engaged, HUI sums all signals through the MASTER VOLUME control into one mono signal.

④ **Master Volume control.** This level control determines the overall level of the currently selected monitor source(s).

⑤ **Output level controls.** Each one of these controls adjusts the output level of its respective audio output pair.

⑥ **Output select switches.** These switches determine which monitor outputs are being used. Labeled OUTPUT 1, OUTPUT 2, and OUTPUT 3/PHONES, they correspond to the MONITOR OUTPUTS 1, 2, 3 and PHONES jacks on HUI's rear panel.

⑦ **Mute and Dim switches.** Out of the box, the MUTE switch mutes all three MONITOR OUTPUTS (including PHONES), while DIM lowers HUI's monitor output level by a set amount (default is 20dB).

To assign mute and dim control to specific outputs, press and hold the OPTION/ALL and MUTE or OPTION/ALL and DIM switches. The LEDs in the OUTPUT assign switches begin blinking to indicate which OUTPUTS are assigned to that particular function. Press an OUTPUT switch to toggle the MUTE or DIM assignment on and off. When it's set the way you want, press and hold the OPTION/ALL and MUTE or OPTION/ALL and DIM switches again to quit.

To change the amount of dim level (i.e., more or less than the default 20dB), press and hold the OPTION/ALL and DIM switches to enter the Dim Assignment Mode (make sure the DIM switch is turned on first if you want to monitor the dim level as

you adjust it). Turn the SCROLL knob left or right to adjust the dim level, which appears in the VFD in 1dB increments. (The SCROLL knob is located on the front panel, in the upper right corner beneath the INSERT/PARAM switch.)

Note: For more on how MONITOR INPUTS *and* OUTPUTS *work with HUI's surround-sound capabilities, see pages 17 and 23.*

Talkback Section

⑧ **Talkback level control.** This controls the level of the internal (panel) talkback mic only.

⑨ **Talkback panel mic.** This on-board mic allows you to communicate with the talent, slate take numbers into your session, etc.

Note: Be sure the INTERNAL/EXTERNAL select switch on the rear panel is set to INTERNAL when using the panel mic.

⑩ **Talkback Enable switch.** This switch turns on/off the talkback panel mic circuit on both the panel mic and external talkback mics. Press and hold this switch to talk, and the red LED in the switch lights to indicate the talkback function is active. If using the REMOTE TALKBK TRIGGER jack on the rear panel to turn the talkback mic on and off, the red LED in the switch lights when the talkback function is active.

To route talkback assignment (it's routed only to OUTPUT 3/PHONES as a default), press and hold the OPTION/ALL and TALKBACK switch. The LEDs in the OUTPUT assign switches begin blinking to indicate which OUTPUTS are assigned to the TALKBACK function. Press an OUTPUT switch to toggle the TALKBACK assignment on and off. When it's set the way you want, press and hold the OPTION/ALL and TALKBACK switches again to quit. Of course, *beware of feedback situations!*
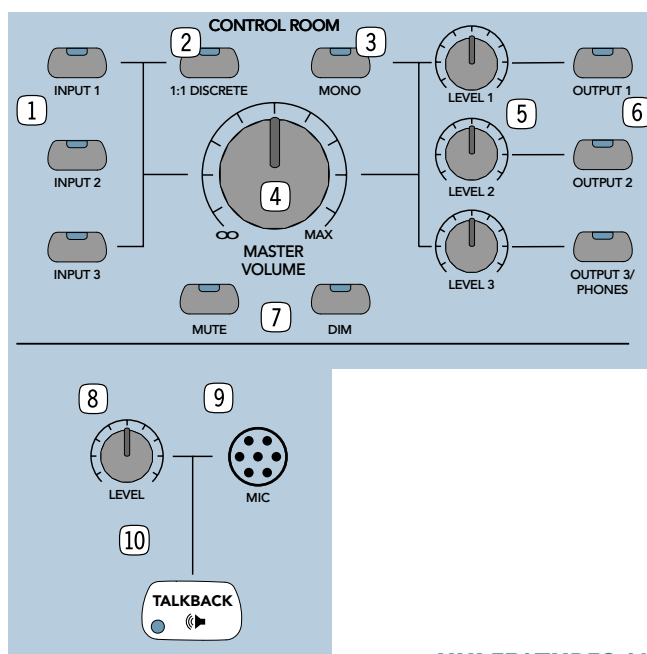
Transport Section

NOTE: The functions of some of these switches depend on your particular DAW software. Therefore, you may want to consult your DAW manual for further details.

① **Transport switches**.

The top row of transport switches includes AUDITION, PRE, IN, OUT, and POST. These switches allow you to set up punch-in/punch-out and playback locations.

- AUDITION lets you play back the section you've designated for punch-in/punch-out.
- PRE sets up the amount of "pre-roll" before the actual punch-in point.
- IN marks the point at which the punch-in will begin.
- OUT marks the point at which the punch-in will end (i.e., the "punch-out" point).
- POST sets up the amount of "post-roll" after the punch-out point.

The second row of Transport switches includes: ◄RTZ, END ►, ONLINE, LOOP, and QUICK PUNCH.

- ◄RTZ returns the playback cursor in your DAW to the beginning of the session (or 0/zero).
- END ► moves the playback cursor in your DAW to the end of the session.
- ONLINE is used to bring your DAW online (or to take it offline), and indicates online status.

- LOOP allows you repeatedly play back a section of your DAW session.
- QUICK PUNCH allows you to use your DAW's "quick punch" feature.

Similar to the transport buttons on a tape recorder or in your DAW, the third row of transport switches includes REWIND, FAST FWD, STOP, PLAY, and RECORD.

② **Mode/Arrow switches.** These switches are used to navigate, zoom, and make selections in the waveform display. When MODE is toggled, the arrow keys act as horizontal/vertical view expander/contractors. When MODE is disabled, the arrow keys can be used as a cursor location device, similar in function to tab and arrow keys on a computer keyboard.

③ **Jog Wheel.** This optical encoder wheel performs many functions (depending on your DAW). Because its function is determined by your DAW, we refer you to your DAW controller manual.

④ **Scrub/Shuttle switches.** These switches control the function of the jog wheel. Again, refer to your DAW controller manual for their specific functions.
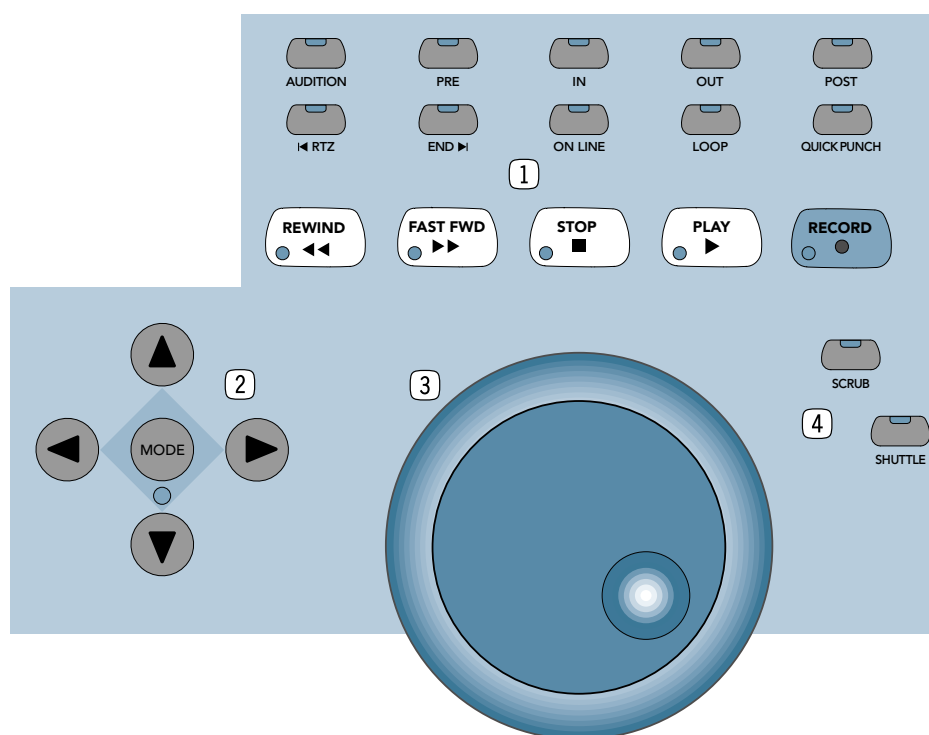
Rear Panel

Controller Input/Output Section

① **Power cord receptacle and Power switch.** The power cord receptacle is a standard IEC connection for HUI's power cord. Before plugging the power cord into an AC outlet, be sure it is firmly seated in the receptacle.

Note: For safety reasons, the AC outlet must be a "3-prong" outlet with hot, neutral, and ground terminals. **Do not bypass the plug's ground pin!** *In addition to the safety issue, this insures that the HUI's chassis is properly grounded which is required for reliable operation of the faders' touch circuits.*

② **MIDI In/Out Connectors.** These are standard MIDI 5-pin DIN ports for connecting HUI to your MIDI interface. (Note: HUI must be connected to a dedicated MIDI input and output pair; these connectors cannot be merged or daisy-chained.)

③ **Keyboard/Mouse ADB ports.** Convenient in/out throughput jacks for direct parallel connection of your ADB (Apple Desktop Bus) computer keyboard and mouse. These are used for extending the reach of your keyboard and mouse between your computer and HUI, not for actual control. See page 19 for more information.

④ **Serial port, RS-232/422 switch.** The serial port is a standard 9-pin D-Sub connector for connecting HUI to the external DAW. The switch selects between RS-232 and RS-422 operation (the data stream is equivalent to MIDI). See page 19 and page 31 for pin out and other specifications.

⑤ **Expansion Port.** 9-pin D-Sub connector for future connection of external control devices.

⑥ **Footswitch Input jacks.** Allows you to use an external footswitch to toggle DAW functions such as loop, play, and record modes.

⑦ **Relay Output jacks.** Used to toggle external circuits for solo indication, "on-air" lights, recording lights, etc. See page 31 in the "Specifications" section for a block diagram of these jacks.

Analog Audio Input/Output Section

⑧ **Monitor Inputs (x3).** These six line-level inputs (balanced or unbalanced) feed the control room section. They can be used either as three stereo pairs or as six discrete inputs.

⑨ **Monitor Outputs (x3).** These six line-level outputs (balanced or unbalanced) from the control room section can be used either as three stereo pairs or as six discrete outputs.

⑩ **Headphones jack.** This is where you plug in your stereo headphones. Its signal is shared with (as well as isolated from) MONITOR OUTPUT 3, so the phones may be plugged in simultaneously.
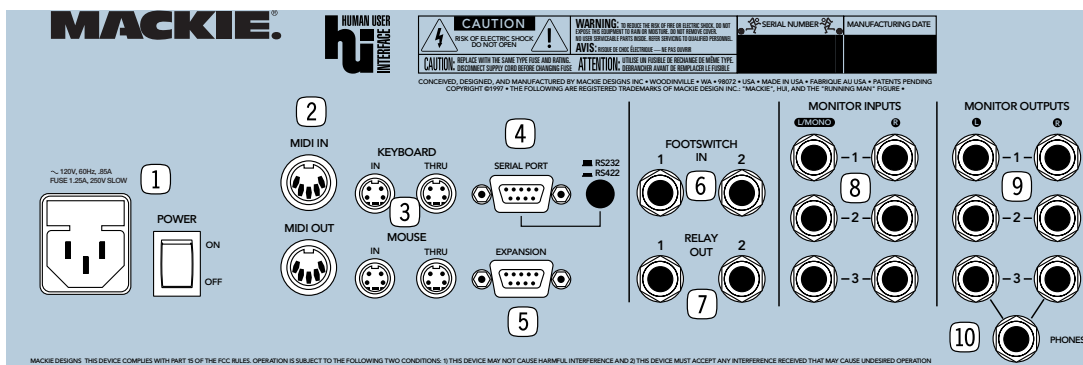
Talkback and Mic Preamp Section

Another great thing about HUI — if we don't mind saying so ourselves — is its talkback and mic preamps. They allow you to add a vocal track, insert slating instructions, and perform other handy tasks, without having to resort to an outboard mixer.

① **Mic preamp Trim control.** Used to set initial gain stage for mic signal levels (Mic 1, Mic 2, and Talkback). Trim level from mic level (60dB down) to Unity (0dBu). Maximum input is +22dBu.

② **Phantom Power switch.** Push this switch to provide 48V of low-current DC to power condenser mics.

③ **Talkback XLR mic input.** Used to connect an external talkback mic. Note that there is no dedicated output for this preamp, although talkback logic routing will send the signal to any or all of the **MONITOR OUTPUTS** (front panel assignable — see instructions for the Talkback Enable switch ⑩ on page 13).
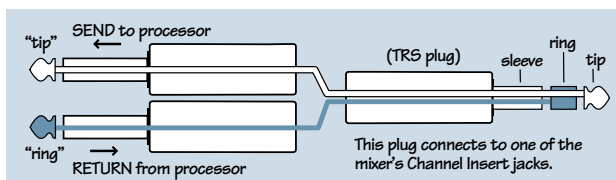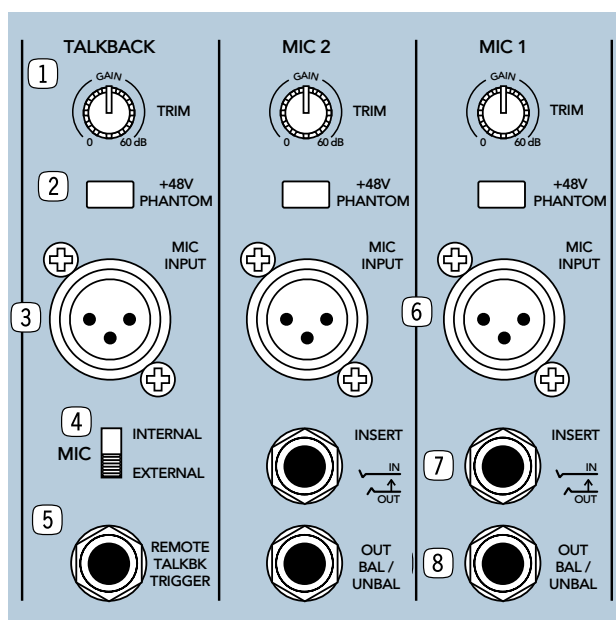
④ **Mic Internal/External switch.** Switches talkback signal source between the front in-panel mic or an external talkback mic plugged in here.

⑤ **Remote Talkback Trigger jack.** The talkback circuit is bidirectional — it can either trigger something or be triggered by something. To remotely trigger HUI's talkback function, connect a normally-open on/off footswitch to this jack. This is for the producer who loves to sit comfortably back and communicate with the talent during crucial moments in a recording session.

Conversely, if the engineer wants to enable another console's talkback function via the HUI front panel talkback switch, connect a TS cable between this jack and an unbalanced destination jack. When the front panel talkback switch is pressed (enabled), the line is pulled "low." See page 31 for a diagram of this circuit.

⑥ **XLR mic inputs.** These are two of Mackie's high-headroom, low-noise mic preamps. Intended for mic-level inputs only, they offer plenty of gain and sonic clarity.

⑦ **Inserts.** 1/4″ TRS insert jacks for using in-line external effects and signal processing with TRS to TS send and TS return "Y" cables. These connectors can also be used as direct outputs using a 1/4″ TS plug pushed in all the way (interrupting the audio signal completely),

Insert Jack "Y" Cable

Direct out with no signal interruption to output. Insert only to first "click."

Direct out with signal interruption to output. Insert all the way in to the second "click."

For use as an effects loop. (TIP = SEND to effect, RING = RETURN from effect.)
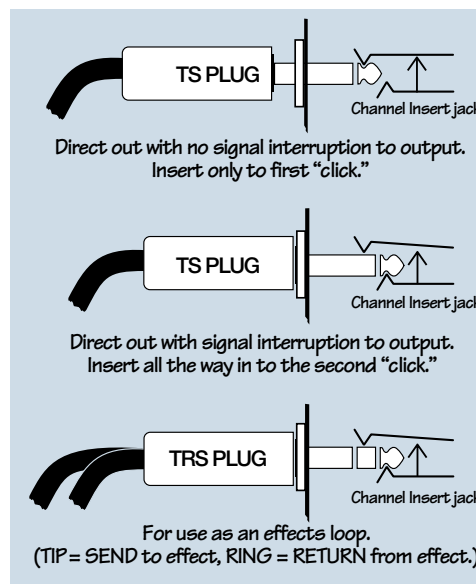
Insert Jack Options

or only to the first click, which does not interrupt the audio (see "Insert Jack Options" figure). The latter method allows you to use the insert as a direct out in combination with the mic output described next.

⑧ **Outputs.** 1/4″ TRS jacks for routing your microphones to external sources, such as the DAW audio interface for recording. These line-level outputs will provide either balanced and unbalanced signals.

AUDIO INPUT AND OUTPUT

Signal Flow Primer

Monitoring the audio signals can be done in either mono, stereo, or surround-sound (with six discrete channels). The overall input volume is controlled by the **MASTER VOLUME** knob. The outputs are controlled by three separate output level controls and toggle switches (labeled **OUTPUT 1, 2,** and **3**). HUI uses DCAs (digitally controlled amplifiers) to control internal signal flow completely independent of the DAW. The signal is distributed according to which inputs and outputs are enabled.

Stereo Monitor Mode — enabled inputs' stereo signals are *summed* into one stereo signal

In stereo monitor mode — with the **1:1 DISCRETE** switch turned *off* — any of the three stereo input sources may feed any of the stereo **MONITOR OUTPUTS** (**OUTPUT 1, 2,** and **3**). Any or all of the three stereo inputs can be monitored simultaneously. That is, it's up to you to disengage an input if you don't want to monitor it. Any and all of the **OUTPUTS** can be active at once, so you can send outputs to various pairs of speakers and various combinations of speaker pairs and recorders.

1:1 Discrete Monitor Mode — enabled inputs are *not* summed

When HUI's **1:1 DISCRETE** switch is engaged (the LED will light), the control room section becomes a discrete surround matrix capable of either standard 4.1 surround (L/R/Center/Surround/subwoofer), or 5.1 surround (L/R/Center/Surround L/Surround R/subwoofer).

You can set up your DAW audio output configuration so that the various "stem" outputs correspond to the physical outputs on the DAW audio interface. These outputs are then patched to HUI's **MONITOR INPUTS 1, 2,** and **3**.

With **1:1 DISCRETE** engaged, the output **LEVEL** controls for **OUTPUTS 1, 2,** and **3** act as trims for the respective mix stems (L/R/Center/Surround L/Surround R/subwoofer). The **MASTER VOLUME** controls the level for all three output pairs, allowing you to trim the overall level of separate surround amp feeds.

Keep in mind that, when in discrete mode, output pairs share a common stereo level control and individual outputs cannot be adjusted independently.

Note: The DIM *and* MUTE *controls operate on all outputs, regardless of whether HUI is in discrete mode.* MONO, *too, sums all inputs together, regardless of mode. Refer to the audio block diagram on page 30 for further info.*
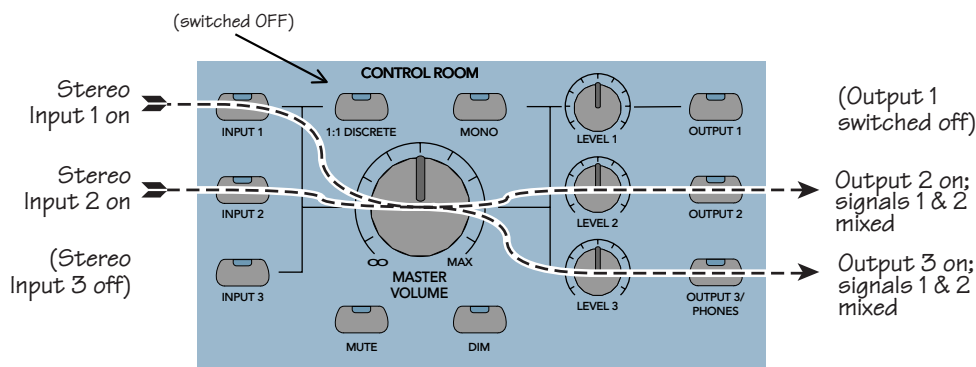
STEREO Monitor Mode
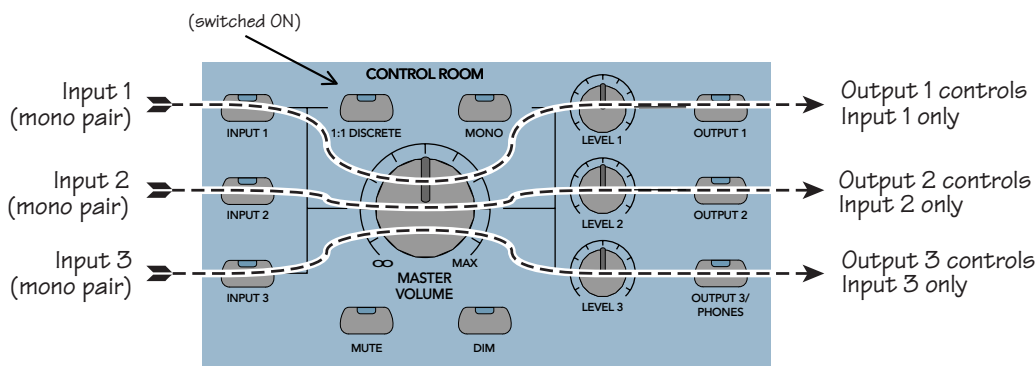
1:1 DISCRETE Monitor Mode

Analog Audio Connections

Microphones

HUI has two stand-alone microphone preamplifiers for connecting mics for use during recording. These mic preamps are of the same high-headroom, low-noise design found on Mackie's celebrated 8•Bus and SR Series mixing consoles. Because we know you don't want to run your quality mics through second-rate preamps, we use preamps with large-emitter-geometry, conjugate-pair transistors, allowing them to sound as good as the preamps on the most expensive consoles.

Connect your mics to the HUI preamps by using an appropriate cable with XLR connectors. (Pin 1=Shield [Ground], Pin 2=Signal High [+], Pin 3=Signal Low [–].)

Adjusting the Mic Trim Control

To get the best signal-to-noise ratio, it is important to set the **MIC TRIM** controls properly.

1. Connect the microphone to the **MIC INPUT** connector. Push in the **+48V PHANTOM** switch if required for your microphone.

2. Turn the **TRIM** level control all the way down (counterclockwise).

3. Disconnect any external gear connected to the **INSERT** jack.

4. Connect the **BAL/UNBAL OUT** connector to the input of the DAW audio interface. Engage the Rec/Rdy function on that channel, and set its input level to unity gain.

5. Make appropriate "noise" into the microphone. For example, have a performer play/sing/strike something or someone, etc. at the level they're going to record or perform. Don't just play a single sustained note, but rather, jam away as you would during a recording or performance. You might want to roll an already-recorded track from your recorder.

6. Adjust the **TRIM** level control. The goal is to produce the highest signal level possible without distorting the mic preamp stage, and to attain the highest bit level when the analog signal is converted to digital, without exceeding the maximum digital value (which results in digital clipping). As a general rule, you want the meter on the DAW audio interface to read at or around –15 dB. The peaks should regularly hit, and occasionally exceed, the –15 dB designation on the meter.

7. If you connect an external processor to the INSERT jack, you may need to readjust the input level control for the DAW audio interface.

Talkback Mic

Though HUI has its own talkback mic on the front panel, you may want to connect an external talkback mic of your own. That's why we've included a talkback mic preamp on the rear panel. This mic preamp is identical to the other two mic preamps (described above), giving you a total of three high-quality mic inputs. Connect your external talkback mic the same way you would the other mics. Be sure the talkback **TRIM** control is turned up (adjust to taste).

The **MIC INTERNAL/EXTERNAL** switch on HUI's rear panel lets you choose between the front in-panel mic or an external talkback mic. Be sure it is switched according to your needs.

Monitor Outputs

To connect studio monitors (like a pair of Mackie's HR824s) to HUI, simply connect one end of your cables (with 1/4″ TRS plugs) into **MONITOR OUTPUT 1** (the left one is for Left speaker or mono output; right is for Right speaker output), and the other ends to your studio monitors.

HUI features three pairs of monitor output jacks, so you can run up to three sets of monitors at one time. You may have one set of monitors in your control room, and one or two others running to various other places like vocal booths or the like. Or you may want to audition your mixes through three different types of speakers (monitors).

Talkback Mic · Studio Mic 2 · Studio Mic 1

Talkback · Mic 2 · Mic 1

Mic Internal/External

Insert · Insert

Trigger · Out · Out

Momentary Footswitch (optional)

Compressor

DAW audio interface
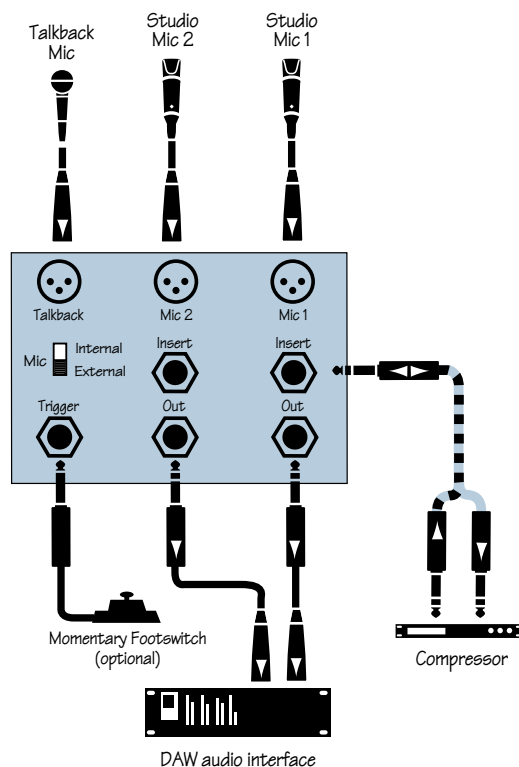
These outputs are designed for *monitoring purposes*. We do not recommend mixing through this output section due to the possibility of feedback routing, and to the fact that smooth fades, if applicable, may experience some "zippering" inherent to digitally controlled amplifiers (DCAs). Although these are high quality DCAs, they are not volume smoothed (interpolated) between their discrete volume levels. The volume taper is mapped to resemble the taper of our analog mixer rotary pots.

DIGITAL CONNECTIONS

MIDI

In order to operate, HUI must be connected to a MIDI interface. The MIDI interface is in turn connected to the external computer used with your DAW.

Connect HUI to a MIDI interface by connecting one MIDI cable between HUI's **MIDI IN** port and the interface's MIDI OUT port. Likewise, the other cable should be connected between HUI's **MIDI OUT** port and the interface's MIDI IN port. Now HUI and your MIDI interface can talk to each other, compare recipes, and share football scores.

RS-232/RS-422 Serial Port

To use HUI in conjunction with a computer, run a cable with a 9-pin D-Sub connector from HUI's **SERIAL PORT** to the computer's COM port.

The serial port on HUI bidirectionally transfers data between a computer's RS-232 or RS-422 serial port and HUI. The only difference between using the **SERIAL** and **MIDI** ports is the rate of transmission of the data (the serial port operates at 38.4K Baud and MIDI operates at 31.25K Baud) and the general physical hardware (9-pin D-Sub vs. 5-pin DIN, respectively). The actual data transferred is the same.

For RS-232: Pin 2=TXD
Pin 3=RXD
Pin 5=Ground

For RS-422: Pin 2=TX–
Pin 3=RX+
Pin 4=Ground
Pin 7 =TX+
Pin 8=RX–

Use the following serial communications parameters when using the **SERIAL** port:

Baud rate: 38.4K
Parity: None
Data bits: 8
Stop bits: 1

Keyboard (computer)

You can "extend" the use of your computer's keyboard by connecting the keyboard to HUI. Simply connect a 4-pin ADB cable from your keyboard to HUI's **KEYBOARD IN** jack. Run another 4-pin ADB cable from your computer to HUI's **KEYBOARD THRU** jack. Now your keyboard can be in closer proximity to HUI.

Note: This extra feature is not required in order to use HUI — it is there as a convenience to those who may need the extra length. The ADB specification limits the ADB cable length to 5 meters (about 16 feet).

Mouse

Similarly, you can extend the use of your mouse (or trackball if you're supremely cool) by connecting it to HUI. Although most Apple computers allow you to connect the mouse directly to the keyboard, some models have more than one ADB connector on the computer. Using a 4-pin ADB cable, connect one end to your computer and the other to HUI's **MOUSE THRU** jack. Then run another 4-pin ADB cable from HUI's **MOUSE IN** jack to your mouse or trackball. (You'll probably be using the cable that is hardwired to your mouse — if you use a trackball you'll need a separate cable.)

You can use the MOUSE I/O to extend a second keyboard/mouse to another computer, which you might use for sequencing or some other purpose.

A note regarding ADB port and MIDI communication: HUI communicates with the host DAW through the MIDI IN/OUT connectors. The mouse and computer keyboard communicate with the DAW through the ADB connectors. The Mouse and Keyboard IN/OUT connectors are wired straight-through, so there is no direct interaction with the HUI, MIDI or SERIAL ports.

Even though both the HUI and the computer keyboard have common modifier switches such as SHIFT, OPTION, ALT, CONTROL, F-keys, etc., the DAW determines how these keys operate and interact with one another. For example, pressing the SHIFT/ADD button on the HUI in conjunction with a mouse click may not work the same as pressing the SHIFT key on the keyboard in conjunction with a mouse click.

Expansion Port

This port is nestled on HUI's backside for use with future products.

Keyboard

Mouse

2nd Keyboard/Mouse (optional)

Mouse

Footswitch
Play ON/OFF

Footswitch
Record ON/OFF

For
Future Products

Note: The Footswitch In and Relay Out
operations are defined by the DAW
software (see DAW MIDI Controller's Guide).
This figure shows one example
of how they might be used.

MIDI OUT   MIDI IN

Keyboard In   Mouse In   Expansion   Footswitch In
Keyboard Thru   Mouse Thru   Serial Port   1   Relay Out   2

(example: triggered by RECORD switch)

RECORDING IN PROGRESS

(example: triggered by PLAY switch)

ON THE AIR

To Computer
Keyboard
Port

To 2nd
Computer
Keyboard
Port

To Computer
Serial Port
(Optional)

MIDI Interface

Computer Serial Connection   Computer   2nd Computer (optional)

Typical System Hookup

APPLICATION HOOKUPS

Some Application Basics

One of the first things to consider when configuring your studio with HUI is what type of application suits you best. If you produce commercials for TV or radio, the TV/Radio Production Hookup may be your best bet. If you record and mix soundtracks for surround sound, you'll probably set up your studio similar to our Surround Sound Hookup.

One thing is certain: you'll want to position HUI in a place central to your work area. It should be close enough to your computer, studio monitors, and of course mixer, to facilitate easy, ergonomic use. If you have your computer in an out-of-the-way location (on the floor behind the console; in an hermetically-sealed coffin six feet under), you'll want to run your computer keyboard and mouse connections from your computer to HUI. You can then use HUI's **KEYBOARD IN** and **MOUSE IN** jacks to place the keyboard and mouse in close proximity to HUI and your mixer. (See "Digital Connections" Section, page 19, for more details.)

What follows are a few sample hookups. Each one shows you a basic setup, lists the equipment you'll need, and gives a few tips and/or insights. Of course, your HUI hookup may be a variation on one of these themes — these are just suggestions, so see what you come up with.

TV/Radio Production Hookup

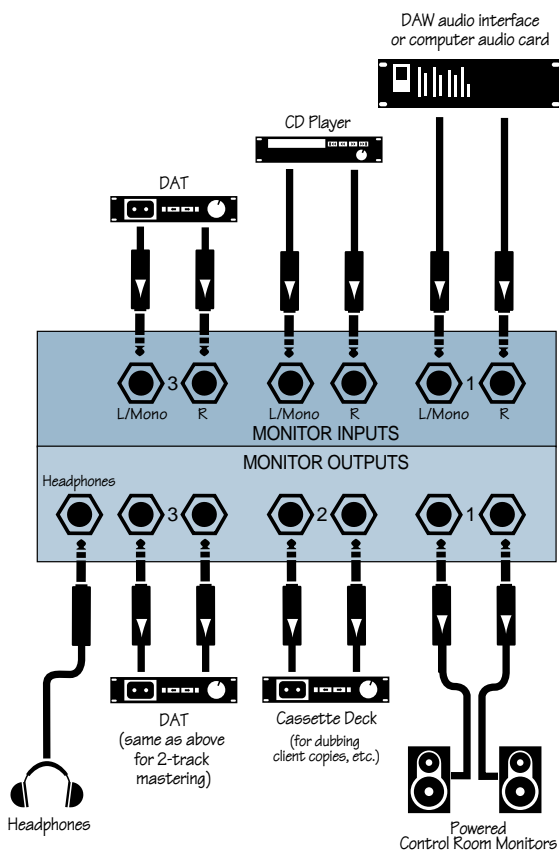**Scenario:** Broadcast, multimedia. audio-for-video suite, production.

Source Material: Prerecorded sound files, music, voiceovers, sound effects, compact disc, videotape, etc.

Outputs: One or more speaker pairs, headphones, mixdown deck (cassette or DAT).

Audio Hookup: Multiple stereo sources into the inputs. The DAW interface or soundcard can play back prerecorded material in playlist or some other composite fashion. The CD and DAT are for A–B playback comparison purposes, extra material, sound check, test tones, etc. The DAT output feeding HUI **INPUT 3** may be the one master deck that is being mixed to from HUI **OUTPUT 3**. (Be careful of feedback loops while recording!)

Digital Control Hookup: MIDI I/O for HUI to the computer/DAW.

Special Notes: To avoid feedback during tracking, do not feed outputs to record-engaged inputs of the same device.

TV/Radio Production Hookup

Tracking/Mixing Hookup

Scenario: Broadcast, multimedia, audio-for-video suite, production, home studio recording, mixdown, playback.

Source Material: Live audio (vocals, guitars, dog, etc.), samplers, synths, drum machines, prerecorded tracks.

Outputs: To DAW interface, mixdown deck, speaker pair(s), headphones, effects loop from inserts.
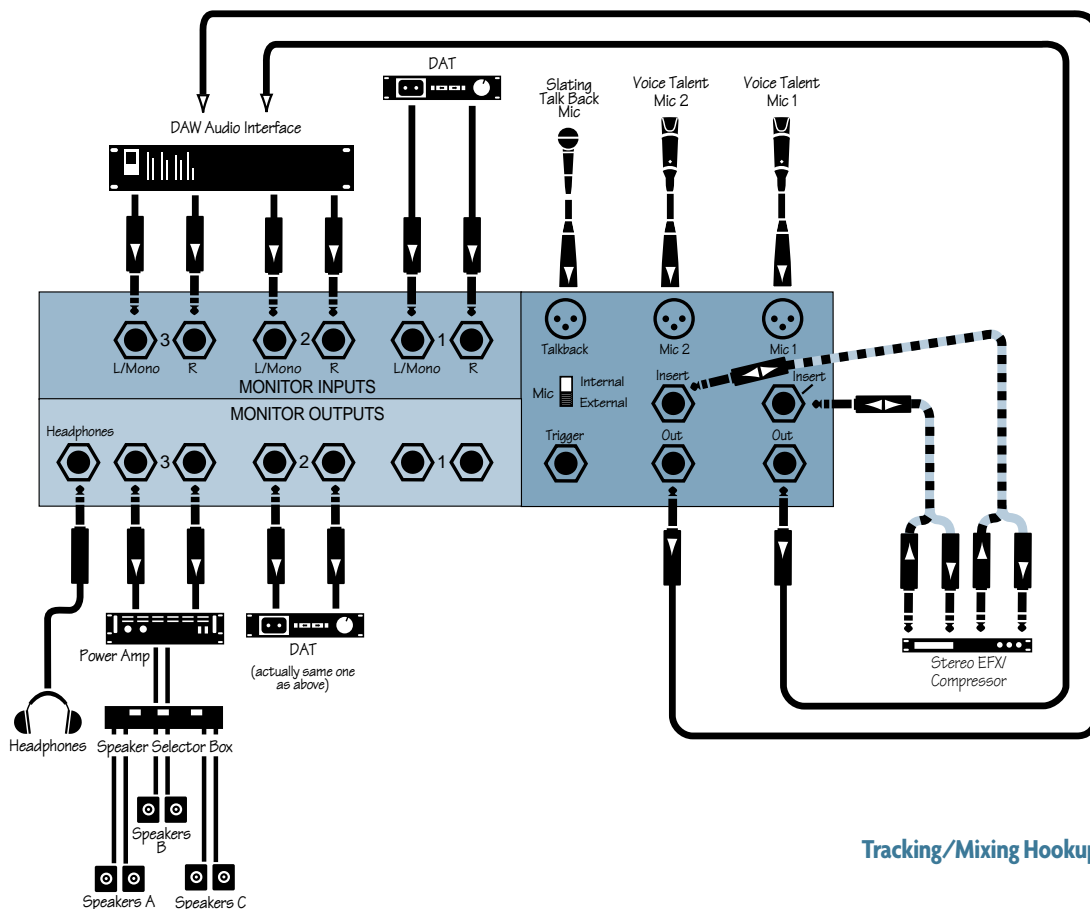
Audio Hookup:

Use Stereo Monitor Mode.

Tracking: One or two mics are plugged into HUI's excellent mic preamps (guitar/vocal, vocal duo, etc.). A stereo compressor/limiter is inline using the insert (compressor/limiter separated as two mono units). The mic's line output is routed to the DAW audio interface either directly or through a microphone mixer.

Overdubbing: Accomplished by recording newly-enabled DAW tracks while monitoring DAW output of previously laid-down tracks through HUI **MONITOR INPUT 3**. The DAT/HUI hookup (**MONITOR OUTPUT 2**) is for final mastering tasks.

Mixdown: After you've recorded all the tracks on the DAW, it's time to automate the mixdown. Follow your DAW's instructions on creating and automating a session. **MONITOR OUTPUT 3** is used for monitor speakers. When you finally have it right, simply run the session one last time with the DAT deck in record mode and its inputs connected to HUI's **MONITOR OUTPUT 2**.

Digital Control Hookup: Connect MIDI I/O from HUI to the computer/DAW. Any other sources that might need to be synchronized to the DAW are totally optional and studio-specific.

Special Notes: Use the **MONO** button in the Control Room section to determine phase cancellation during recording (i.e. mics cancelling out each other). **MONO** is also a useful check for stereo material that is to be aired for mono broadcast (again, as a level balance and phase cancellation check).

Tracking/Mixing Hookup

Surround-Sound Hookup

Scenario: Film, DVD, home theater mixing.

Source Material: Dialog, sound effects, music, ambience stems, Foley, etc.

Outputs: As above.

Audio Hookup: To patchbay and HUI.

For monitoring when recording or mixing for surround-sound, we suggest the following discrete signal arrangements. Of course, using a half-normalled or multed patchbay to simultaneously feed the signals to the final mix recording deck and to HUI (for monitoring) would make life much easier. Consult your favorite pro audio or music dealer for more information on patchbays.

Be sure the 1:1 DISCRETE button is switched on for the following applications.

For 5.1 Surround-Sound

On HUI's rear panel, connect your DAW audio interface outputs to:

Input 1 = L/R inputs
Input 2 = L/R Surround inputs
Input 3 = Center/Subwoofer inputs

Output assignments (to control room amplifiers) would follow the same basic signal routing paths.

For 4.1 Surround-Sound

On HUI's rear panel, connect your DAW audio interface outputs to:
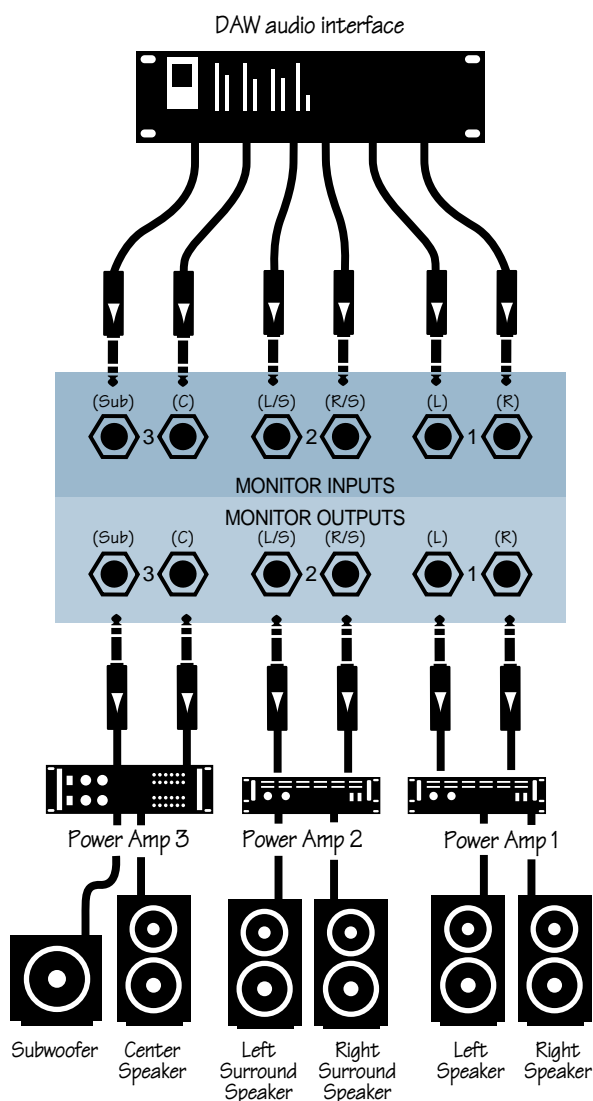
Input 1 = L/R inputs
Input 2 = Center/Mono surround inputs
Input 3 = Subwoofer

Output assignments (to control room amplifiers) would follow the same basic signal routing paths.

Digital Control Hookup: Studio sync as applicable.

For further explanation of HUI's surround-sound monitoring abilities, turn back to page 17.

Surround-Sound Hookup (5.1 configuration shown)

Full-On Major League Hookup

Scenario: Any audio application with a plethora of inputs to stereo final master. HUI is the control room hub, so the mains or control room outputs of the mixer and DAW feed HUI.

Source Material: Live audio, synths, samplers, multitracks, DAW tracks, etc.

Outputs: HUI's **OUTPUT 1** is fed to a headphone amp/mixer for further distribution to multiple headphone pairs. **OUTPUT 2** goes to a dubbing or mastering deck. **OUTPUT 3** is routed to a speaker selector box so multiple speaker pairs can be used.

Audio Hookup:

Tracking: Normally, live audio goes either to tape or hard disk, while MIDI-sequenced synth, samplers, etc. are used to play against during overdub or as final mixdown "virtual" tracks. Virtual tracks are good for saving tape and hard disk space, and avoiding added noise through additional audio transfer and tracking.

- The mixer mains, the mastering deck, and the DAW feed HUI's inputs, for control room monitoring purposes.

- The mixer aux sends, DAW aux send buses (available in Pro Tools 4.1, for example), and HUI **OUTPUT 1** feed the external headphone mixer — all for extra and/or remote monitoring purposes.
- HUI **OUTPUT 3** feeds a speaker selector for A/B comparison of big vs. small speakers, mono level-balancing, etc.
- Mics are used as: direct-to-DAW feeds for boosting signals to line level, or as extra mic preamps to feed line inputs on the mixer.
- The engineer's talkback mic is set to feed all of the monitor outputs.
- A stereo compressor/limiter feeds the inserts as two mono compressor/limiter units.

Digital Control Hookup: HUI MIDI I/O, as well as MIDI sync and triggering to all instruments to sync with digital audio from the DAW.

Special Notes: Use the **MONO** button in the Control Room section to determine phase cancellation during recording (i.e., mics cancelling out each other). **MONO** is also a useful check for stereo material that is to be aired for mono broadcast (again, as a level balance and phase cancellation check).

Full-On Major League Hookup
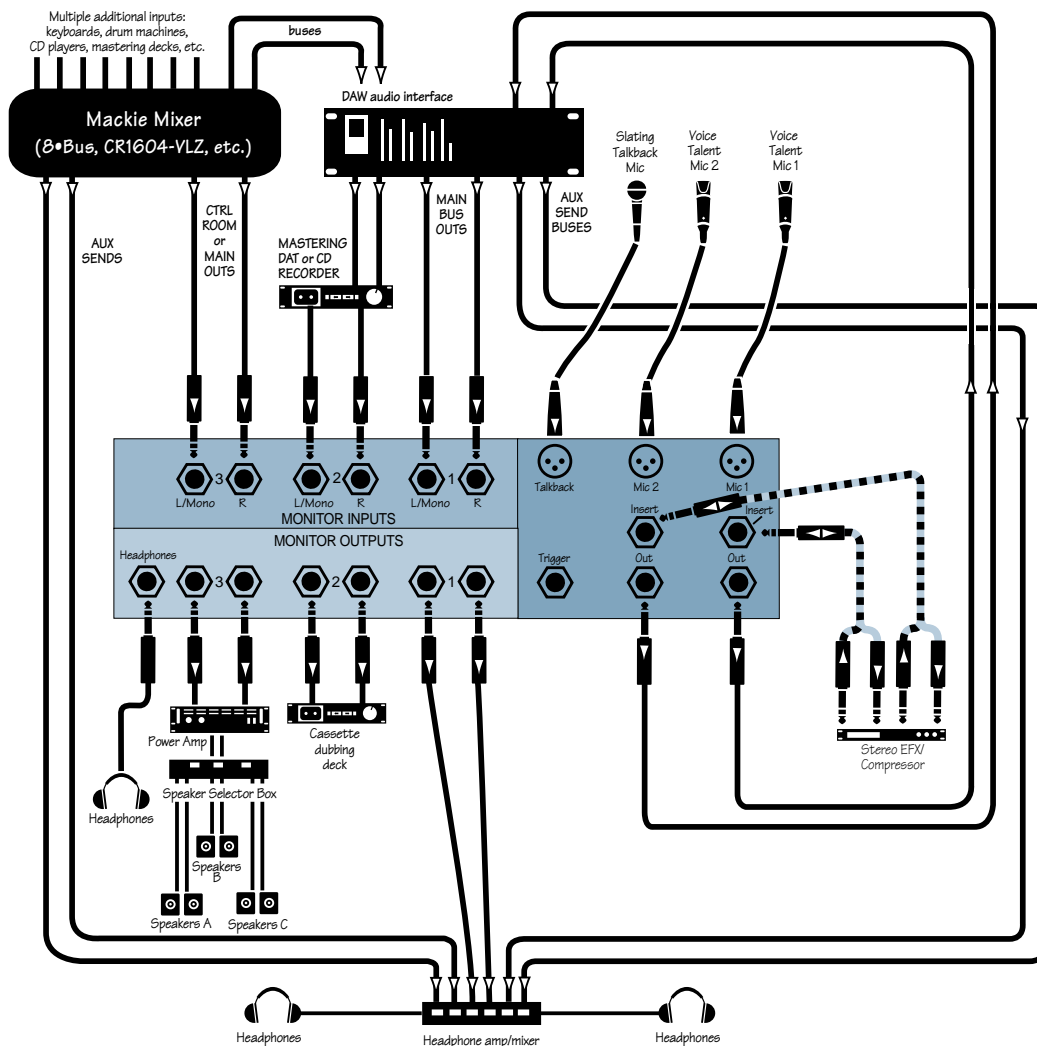
TROUBLESHOOTING

Having trouble getting things to "cooperate"? Consult the Troubleshooting chart on this page. It should point you in the general direction of things to check, etc. Then proceed to the following pages to help you narrow down the problem. If you believe the problem is HUI related, see the Service section on page 27.

Perform a HUI Hardware Self-Test

HUI has a built-in self-test routine which can help you determine if the problem you're experiencing is HUI related or not. You need the following items to perform the self-test:

• One standard MIDI cable
• Two normally-open footswitches (or two 1/4" plugs or patch cords with tip shorted to sleeve)

1. Connect a MIDI cable from HUI's **MIDI OUT** jack to HUI's **MIDI IN** jack. This allows HUI to run the test and then loop the information back to itself.

2. Connect a normally-open footswitch to each of the **FOOTSWITCH IN** jacks.

3. Plug the power cord into a 3-prong AC outlet, that you know has a good safety ground. (You might want to test the outlet with an AC outlet tester. You can get one at Radio Shack or most hardware stores.)

4. Turn on HUI by pressing the **POWER** switch on the rear panel.

5. Within three seconds after turning on the power, simultaneously press the **SHIFT** and **OPTION** buttons (located in the "Keyboard Shortcuts" section at the lower left area of HUI's front panel). You will see the 40x2 character VFD on the front panel light up and it will prompt you with the instructions to complete the self-test.

Note: You can quit the self-test at any time by simply turning off HUI's Power switch.

Be sure to follow the instructions displayed in the VFD completely. You want to be sure HUI is ready to roll when you've finished this test.

6. Use the footswitch to step through the self-test. By now you may be thinking, "Why is it called a 'self-test' when I have to help it along?" It's because we thought "Human-Assisted Semi-Self-Test" was practically an oxymoron, not to mention being a bit long.

Audio

If you're having trouble getting audio through HUI, check the following:

General

• Say, uhhh, is the **POWER** switch turned on? Sorry—gotta ask.
• Have you tried re-booting HUI by turning it off, waiting a few seconds, and then turning it back on again? Sometimes this can help alleviate the little burps and hiccups that can occur. (Be sure to turn down the volume on any connected power amps first BEFORE re-booting.)
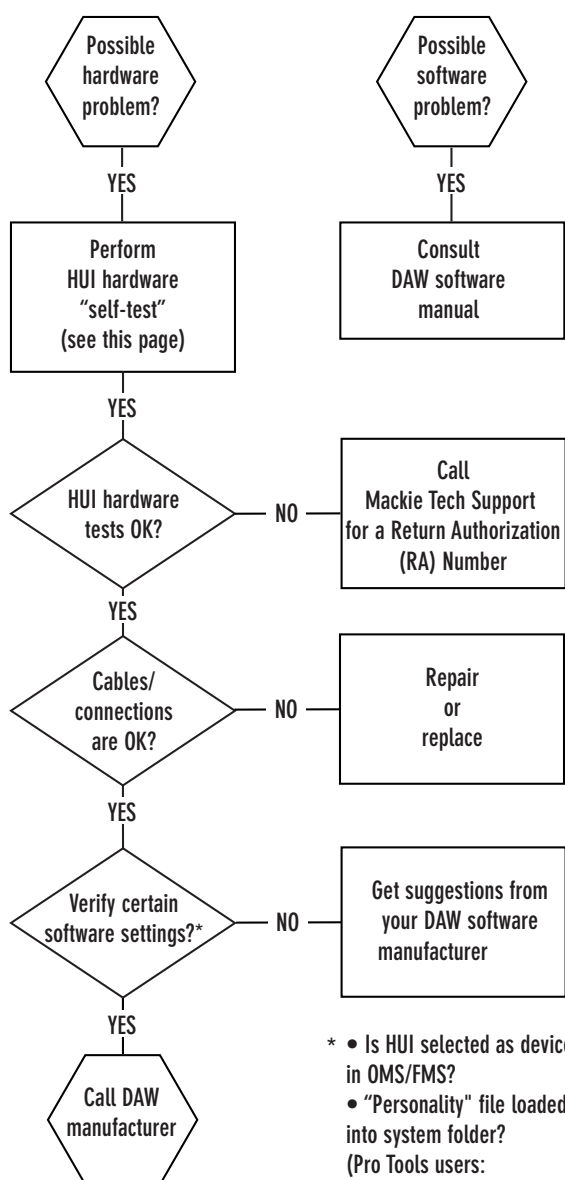
* • Is HUI selected as device in OMS/FMS?
  • "Personality" file loaded into system folder?
  (Pro Tools users: The "personality" file goes in the DAE folder inside the System folder)

Bad Input

- Is an **INPUT** assigned for output to a connected output device? (i.e., speakers or head- phones)
- Is the proper **FADER** up? Is the proper **FADER** assigned?
- Try unplugging any insert devices from the **INSERT** jacks.
- Make sure anything plugged into an **INSERT** is plugged in correctly (i.e., to first click or second click, depending on what type of plugs you're using).
- Is the **MASTER VOLUME** turned up?
- Are the input and output assignments set correctly?
- Try the same source signal in another **INPUT**, set up exactly like the suspect input.

Bad Output

- Are any of the **MUTE** switches turned on?
- Is an **OUTPUT** selected?
- Is HUI connected to your studio monitors or other such speakers?
- Check your cables to make sure they're all working properly.
- Try multiple source and destination substitutes.
- Check your signal flow and gain staging.
  Note: The LEVEL *controls for the* MONITOR OUTPUTS *use high-quality DCAs (Digitally Controlled Amplifiers). Due to the discrete nature of a DCA, if you change the level quickly you may perceive a "zippering" effect as the volume ramps up or down. This is normal, and should not present a problem for normal monitoring purposes.*

Fader Touch-Circuits

The fader's touch-circuits are designed to disengage the fader motor as soon as you touch the fader knob. When you release the knob, HUI again takes control over the fader (motor engages).

The fader knob is electrically conductive, and when your finger touches the knob, HUI senses your touch and sends a message to the DAW through the MIDI connection. The DAW reacts by sending a message back to the HUI to disengage the motor. You can observe the MIDI port IN and OUT LEDs blink on the MIDI interface when you touch a fader.

When you release the fader, HUI sends another message to the DAW, via MIDI. Depending on how the DAW is configured for that channel, it may send a message back to HUI to turn on the fader motor. Again, you can observe the MIDI message activity by watching the MIDI interface I/O LEDs blink.

If the motors continue to operate when you touch the knobs, HUI may not be properly grounded.

- Make sure the AC linecord is plugged into a "3-prong" outlet. The outlet should be properly wired and grounded. If you're not sure, test it with a three-wire AC outlet tester, available at most fine hardware stores or electronics supply shops. It will tell you if the polarity of the hot and neutral wires is reversed and if the safety ground is disconnected.
- Try another AC outlet if you're still not sure if the outlet is properly wired.
- Make sure the plug's ground pin is not bypassed with a "3-pin to 2-pin" adapter. This is important not only for product safety, but to insure that HUI has an "earth" ground reference for proper operation of the touch-circuits.

If the touch circuits still fail to operate properly:

1. Try touching the HUI's chassis with one hand to connect your body to the HUI's ground reference, and touch the fader knob with the other hand.

2. Try installing an anti-static mat from an electronic supply shop, and connect the ground wire between the mat and the ground lug on the HUI (located just above the Power switch on the rear panel.)

3. Try installing a conductive metal sheet beneath the carpet at your workstation. Connect a wire between the metal sheet and the ground lug on the HUI.

If none of the above suggestions fix the problem, try the self-test on page 25. If that doesn't work, and you're sure it's not a digital/MIDI-related problem (see next section), refer to "Service" on the next page.

Digital/MIDI

HUI is a MIDI device. It must be able to send and receive MIDI data to work with your DAW. HUI uses a type of active sensing to let you know that MIDI communication is established. This is indicated by a blinking LED in the bottom right corner of the Time Code Display. Once MIDI communication is established, any interruption in the incoming MIDI data causes "OFFLINE" to be displayed in the VFD, and the LED to stop blinking.

MIDI configuration software such as OMS (Open Music System) and FMS (FreeMIDI System) are commonly used to facilitate use of third party controllers such as HUI. Therefore, it's important to make sure that HUI is defined as a controller device in your OMS or FMS software, and also as a controller in the DAW environment.

First, answer the following OMS/FMS-related questions before pressing the **PANIC** button (not included on HUI):

- Is AppleTalk off? The computer uses AppleTalk to operate through its printer port; AppleTalk can block MIDI transmission.
- Does OMS/FMS "see" the MIDI interface?
- Is the interface speed set the same in both the OMS/FMS setup and the hardware interface? MIDI won't transfer information if the interface is set to one speed and the software is set to another.
- If you have multiple setups, is the setup document being used the most current one (or recommended)?
- Are the MIDI instruments connected to the appropriate port?
- Are all MIDI connections made properly? (See page 20 for connection diagram.)
- Are your MIDI cables OK?

Many MIDI interface boxes provide indicators to let you know when MIDI data is being sent and received. If HUI passes the MIDI test in it's self-test routine (see page 7), any MIDI communication problem must lie elsewhere. Touch one of HUI's faders and move it a little. Does the MIDI interface "receive" indicator light? If it doesn't, check or replace the MIDI cable between HUI's MIDI OUT jack and the MIDI interface's IN jack.

Now move one of the faders in the DAW software. Does the MIDI interface "transmit" indicator light? If not, check or replace the MIDI cable between the computer and the MIDI interface "To Computer" connector.

- Is the device information configured properly?
- Is the correct MIDI channel defined to the proper MIDI port? (HUI operates on MIDI channel 1.)
- Is your MIDI interface working properly? Is it connected to the correct port on your computer?
- Ummm, is the MIDI interface turned on?

SERVICE

Service for HUIs bought and residing in the United States is available only Mackie Designs. (Do not contact Digidesign.) HUI owners outside the U.S. should consult their local Mackie dealer or distributor for service.

Now then, please follow these instructions:

1. Review the Troubleshooting section of this reference guide (pages 25-26). Assuming you've done so, and used up your voluminous reserves of common sense…

2. Have your HUI serial number ready — hopefully you copied it down in the front of this manual (page 3).

3. Call Mackie Tech Support at 800-258-6883 (8 AM to 5 PM, Pacific Time) to explain the problem. If it can't be solved over the phone you will be issued an RA (Return Authorization) number. *You must have an RA number before you can obtain service from the factory.*

4. Set aside the power cord, reference guide, and anything else you want to keep. This may or may not include half-eaten sandwiches and large sums of money. Mackie will only send back your HUI.

5. Pack the HUI in the original box, with the original foam innards or other packing materials. You DID save that stuff, didn't you? If you didn't, you'll need to purchase a new box and packing materials from Mackie. *Mackie is not responsible for any damage resulting from shipments of product in "non-original" packaging.*

6. Include a legible note stating your name, return shipping address (no P.O. boxes of course), daytime phone number, the RA number, and a detailed description of the problem, including how we can duplicate it.

7. Write the RA number in huge letters on top of the box.

8. Ship the HUI to Mackie. We recommend UPS (United Parcel Service), and suggest you get insurance on the package. Send HUI to this address:

Mackie Designs Inc.
Service Department
16220 Wood-Red Rd. NE
Woodinville, WA 98072

9. When we're finished taking care of HUI, we'll try to send it back to you within three business days. Ask Tech Support for current turnaround times when you call for your RA number. We normally send packages via UPS Blue (second-day air). But, if you rush your HUI to us via air mail, we'll do the same for the return trip. This does not necessarily apply to non-warranty service.
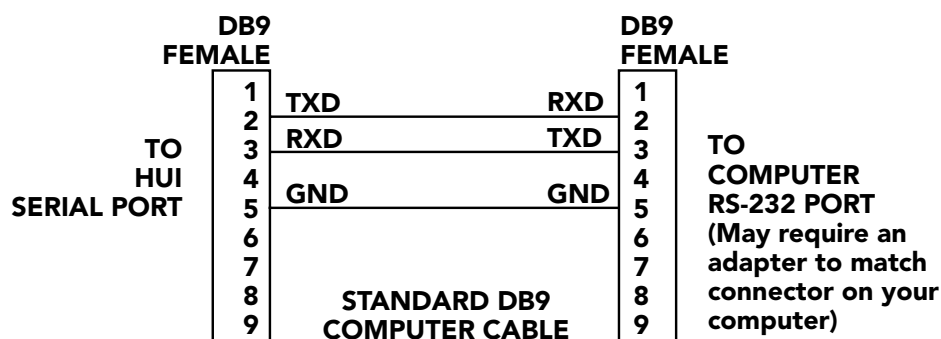
SPECIFICATIONS

HUI MIDI Implementation Chart   **Version: 1.0**   **Date: 9/19/97**

Function		Transmitted	Recognized	Remarks
Basic Channel	Default	1	1	Channel 1 only
	Changed			
Mode	Default	X	X	Not Applicable
	Messages	X	X	
	Altered	X	X	
Note		O	X	90 00 7F Echoed - sent and received
Number	True Voice	X	O	90 00 00 "active sensing" only
Velocity	Note ON	X	X	
	Note OFF			
Aftertouch	Keys	X	O	meters
	Channels	X	X	
Pitch Bend		X	X	
Control Change		00-07 Faders (20-27)	0C (2C) LEDs	Fixed specification
		08-0B Ctrl Pots	Servo Faders	Fader resolution
			Relays	(00-07 MSB)
		0D Jog wheel	Clicker	(20-27 LSB)
		0F (2F) Switches	Tone	
		40-4C V-Pots	Touch Off	
Program				
Change	true number	X	X	
System Exclusive		X	O	Character displays, System Parameters
System Common	Song Pos	X	X	
	Song Sel	X	X	
	Tune	X	X	
System	Clock (F8)	X	O	Increment frames display (+1)
Real-time	Commands	X	X	
	MTC	X	O	MTC 1/4 frame
	Local On/Off	X	X	
Aux	All Notes Off	X	X	
Messages	Active Sensing	X	*	* see Note Number above
	System Reset	X	X	

Mode 1: Omni On, Poly   Mode 2: Omni On, Mono   O: Yes
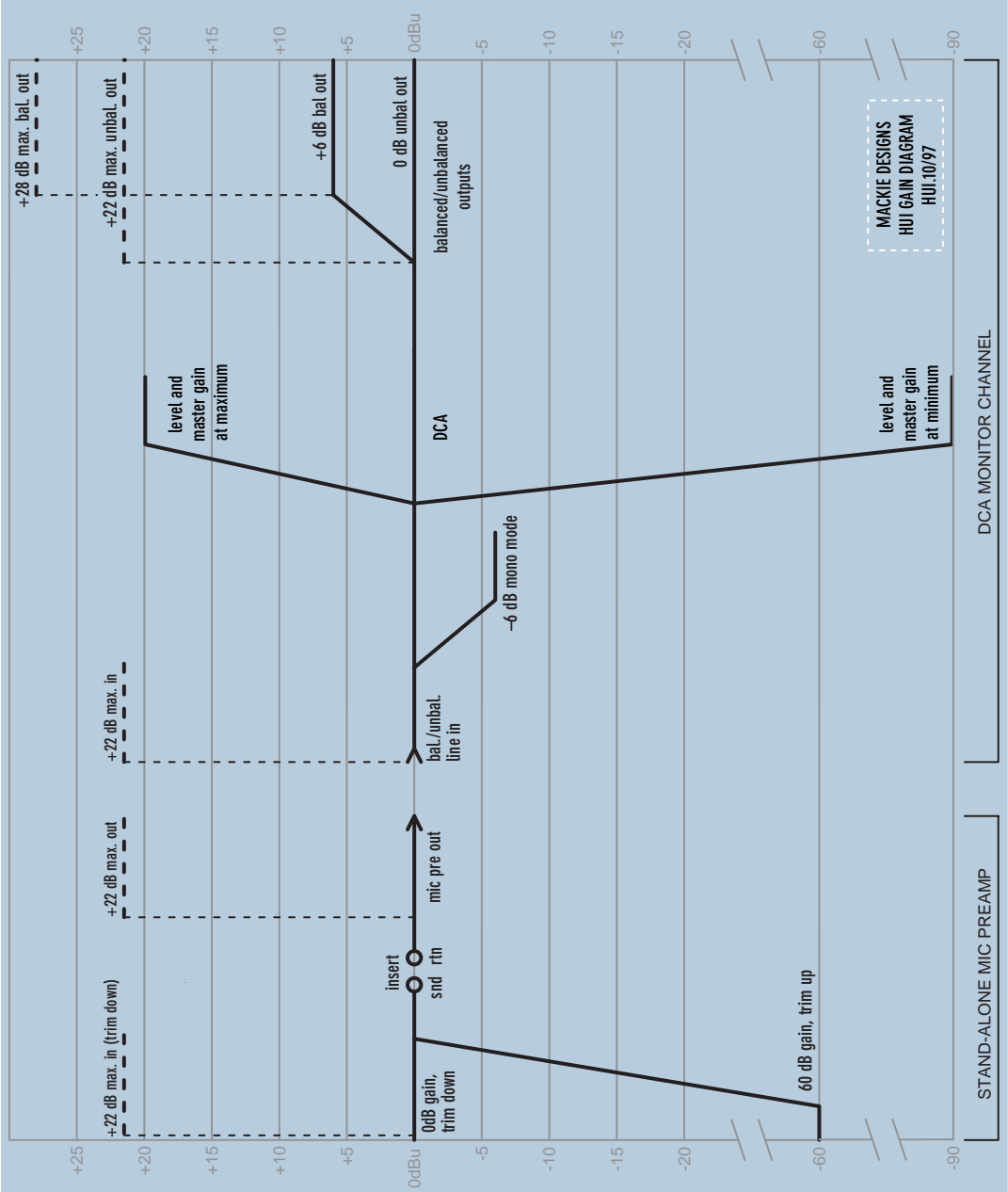Mode 3: Omni Off, Poly   Mode 4: Omni Off, Mono   X: No

RS-232 Connection Diagram

DB9 FEMALE			DB9 FEMALE
1			1
2	TXD	RXD	2
3	RXD	TXD	3
4			4
5	GND	GND	5
6			6
7			7
8			8
9			9

TO HUI SERIAL PORT

STANDARD DB9 COMPUTER CABLE
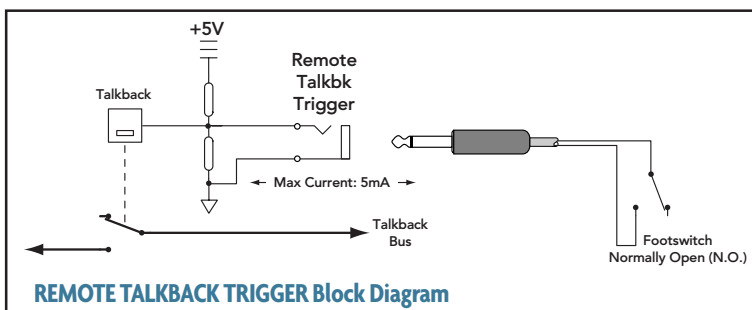
TO COMPUTER RS-232 PORT (May require an adapter to match connector on your computer)

See page 19 for more pin configuration information.

HUI Audio Section Gain Structure Diagram

+25 +20 +15 +10 +5 0dBu −5 −10 −15 −20 −60 −90

+28 dB max. bal. out

+22 dB max. unbal. out

+6 dB bal out

0 dB unbal out

balanced/unbalanced outputs

level and master gain at maximum

DCA

level and master gain at minimum

−6 dB mono mode

+22 dB max. in

bal./unbal. line in

+22 dB max. out

mic pre out

insert
snd rtn

+22 dB max. in (trim down)

0dB gain, trim down

60 dB gain, trim up

+25 +20 +15 +10 +5 0dBu −5 −10 −15 −20 −60 −90

MACKIE DESIGNS
HUI GAIN DIAGRAM
HUI:10/97

DCA MONITOR CHANNEL

STAND-ALONE MIC PREAMP

HUI BLOCK DIAGRAM
Audio Section

Mackie Designs
Human User
Interface (HUI ™)
for Digital Audio
Workstations

Block Diagram
Audio Section
v1.0 — 10/97

FOOTSWITCH IN Block Diagram

RELAY OUT Block Diagram

REMOTE TALKBACK TRIGGER Block Diagram

F-Key	Function performed
F1	Clears clip and peak holds from the meter.
F2	Activates/deactivates Relay Outputs 1 and 2. (When activated, Relay Output 1 is controlled by the PLAY button in the Transport Section. Relay Output 2 is controlled by the RECORD button.)
F3	Enables/disables the audible click function for the V-Pots below the VFD. This function applies only while in Assign mode.
F4	Displays the version number of the HUI personality file currently installed in the host computer.
F5	Reserved for future expansion.
OPT+F5	Enables/disables the audible click function for the buttons.
F6	Reserved for future expansion.
F7	Reserved for future expansion.
F8/ESC	Serves as an escape switch to cancel any assignment mode or onscreen dialog.

Function Key Table

Serial Port

RS-232 9-Pin D-Sub Connector	
Pin No.	Function
Pin 2	TXD
Pin 3	RXD
Pin 5	Ground

RS-422 9-Pin D-Sub Connector	
Pin No.	Function
Pin 2	TX–
Pin 3	RX+
Pin 4	Ground
Pin 7	TX+
Pin 8	RX–

Serial Port Pin-Out Chart

Expansion Port

RS-232 9-Pin D-Sub Connector	
Pin No.	Function
Pin 2	TXD
Pin 3	RXD
Pin 5	Ground

Expansion Port Pin-Out Chart

SPECIFICATIONS 31

HUI Audio specifications

Signal-to-Noise Ratio

> 92 dB

E.I.N.

Microphone preamp 20Hz to 20kHz	−129.5dBm

Total Harmonic Distortion

< 0.005%

Input 1,2,3 Left to Right Channel Crosstalk

@ Unity gain	less than 80dB @ 10 kHz

Frequency Response

20Hz to 60kHz	+0/−1dB
10Hz to 100kHz	+0/−3dB

Maximum levels

Mic preamp input	22dBu
All other inputs	22dBu
Unbalanced outputs	22dBu
Balanced outputs	28dBu

DIM level

Adjustable	10dB-40dB attenuation

Impedance

Mic preamp input	2.4kΩ
All other inputs (other than inserts)	>10kΩ
All balanced outputs	240Ω
All unbalanced outputs	120Ω

Power Requirements

All configurations	60 watts

Fuse

120VAC	1.25A/250V Slo-Blo
100VAC	1.6A/230V Slo-Blo
230VAC	630mA/250V Slo-Blo

Weight

37 lb. (16.8 kg)

Dimensions

Height	6.5 inches (16.5cm)
Width	20.6 inches (52.3cm)
Depth	
Right Side	22.5 inches (57.2cm)
Left Side	20.75 inches (57.2cm)

Since we are always striving to make our products better by incorporating new and improved materials, components, and manufacturing methods, we reserve the right to change these specifications at any time without notice.

GLOSSARY

The following is an admittedly short glossary of audio terms used in this owner's manual. The more basic terms can be found in a variety of places; we'd be foolish to forget to mention our web site. Go to **www.mackie.com** to find a more thorough audio glossary. Additionally, we recommend the following books: *The Audio Dictionary*, by Glenn White; *Tech Terms*, by Peterson & Oppenheimer; *Handbook for Sound Engineers*, by Glen Ballou; and *Sound Reinforcement Handbook*, by Gary Davis.

active sensing

MIDI message echoing that occurs between HUI and the host DAW to confirm that communication is occuring. The right-hand decimal point in the Time Code Display blinks once per second to indicate that MIDI communication is established.

DAW

See *digital audio workstation*.

DSP

Abbreviation for *digital signal processing*. DSP can accomplish the same functions found in analog signal processors, but performs them mathematically in the digital domain, with more precision and accuracy than its analog counterpart. Since DSP is a software-based process, parameters and processing functions are easily changed and updated by revising the software, rather than redesigning the hardware. DSP can be found in an outboard effects device, such as a reverb or delay unit, or it can be integrated into a DAW or digital mixing console.

discrete channel

Used in reference to surround-sound applications, a discrete channel is separate or isolated from the stereo pair of channels it is normally associated with.

digital audio workstation (DAW)

A dedicated recording/editing software (application) and hardware system, used for hard disk (non-linear) random access playback and recording. Many DAWs are used with personal computers using Windows® 95 or Macintosh® operating systems, though some use their own proprietary computers.

effects devices

External signal processors used to add reverb, delay, spatial, or psychoacoustic effects to an audio signal. An effects processor may be used as an insert processor (serial) on a particular input or subgroup, or it may be used via the aux send/return system (parallel). See also echo, reverb.

FMS

Short for *FreeMIDI System*. FMS allows your computer to decipher information coming from the MIDI interface, which is connected to both your computer and HUI.

gain stage

An amplification point in a signal path, either within a system or a single device. Overall system gain is distributed between the various gain stages.

linear, non-linear

Linear audio recording and playback is sound that has been recorded to tape and played back in the same linear fashion. Non-linear recording and playback uses audio sound files that have been "recorded" to the hard disk of a computer. Though the sound file information may be stored in a random fashion on the hard disk, it is played back in the same linear way it was recorded.

line level

A signal whose level falls between –10dBu and +30dBu.

MIDI

Acronym for *musical instrument digital interface*. MIDI is the music industry's standard serial communication protocol. HUI uses MIDI to bidirectionally communicate with the DAW software. (Refer to the DAW controller documentation for specific MIDI routing and channel information prior to hookup.)

OMS

Short for *Open Music System*. OMS allows your computer to decipher information coming from the MIDI interface, which is connected to both your computer and HUI.

phantom power

A system of providing electrical power for condenser microphones (and some electronic pickup devices) from the sound mixer. The system is called phantom because the power is carried on standard microphone audio wiring in a way that is "invisible" to ordinary dynamic microphones. Mackie mixers use standard +48 volt DC power, switchable on or off. Most quality condenser microphones are designed to use +48 VDC phantom power. Check the manufacturer's recommendations.

Generally, phantom power is safe to use with non-condenser microphones as well, especially dynamic microphones. However, unbalanced microphones, and some electronic equipment (such as some wireless microphone receivers), can short out the phantom power and be severely damaged. Check the manufacturer's recommendations and be careful!

RS-232, RS-422 serial port connection

Two industry standard serial communication protocols, requiring different 9-pin wiring schemes. HUI's RS-232/RS-422 serial port can be used with either type of connection, determined by switching to the appropriate protocol. RS-232 uses unbalanced drivers and receivers, in which one wire is used per signal. RS-422 uses balanced, or differential, drivers and receivers, which require two wires per signal. RS-232 works well for short runs (up to 50 feet), while RS-422 is recommended for longer runs (up to 1000 feet).

surround-sound

Multi-channel audio playback systems in 4, 5, or 6 channel formats. Surround-sound is typically found in movie theaters and home theater systems. HUI's control room section can accommodate up to six discrete (separate) audio channels, for use in what is termed "5.1 surround." (4.1 surround can also be monitored with HUI.)

touch-updatable motor fader

HUI's fader knobs are made of conductive metalized plastic, which respond immediately to touch control via capacitive contact between the neutral (ground) control surface and the user. The fader motor uses a high resolution, tightly-tuned servo amplifier, which moves the fader knob and stem along a conductive plastic fader track.

Operationally, when you touch the knob, the motor disengages from the fader via internal and software control, concurrently sending out positional status from HUI to the DAW mixer map over MIDI or other serial communication. When you release the fader knob(s), the motor re-engages via control information from the DAW mixer map.

VFD

Abbreviation for *vacuum fluorescent display*. HUI's VFD is an 80-character (40 characters by 2 lines) display that shows channel strip DSP functions and other HUI operation parameters.

V-Pot™

Abbreviation for *virtual potentiometer*, the V-Pot is considered a "soft knob" because it performs various functions determined by the DAW software being used with HUI. It acts as a continuous or variable controller and also reflects current value or position via its surrounding 12-segment LED collar.

COLOPHON

MACKIE.

Please keep your sales receipt in a safe place.

A. Mackie warrants all materials, workmanship, and proper operation of the HUI for a period of one year from the original date of purchase. If you complete the optional questionnaire portion of the Product Registration Card, the warranty will be extended for an additional two years on all parts and labor, with the exception of faders and fader motors, which retain a one year warranty. If any defects are found in the materials or workmanship or if the product fails to function properly during the applicable warranty period, Mackie, at its option, will repair or replace the product. **This warranty applies only to equipment sold and delivered within the U.S. by Mackie or its authorized dealers.**

B. Failure to return the card will not void the 1-year warranty.

C. Service and repairs of Mackie products are to be performed **only** at the factory. Unauthorized service, repairs or modifications will void this warranty.

D. To obtain factory service:

1. Call Mackie at 800/258-6883, 8AM to 5PM Monday through Friday (Pacific Time) to get a Return Authorization (RA). Products returned without an RA number will be refused.

2. Pack the HUI in its original shipping carton. If you do not have the carton, just ask for one when you get your RA number, and we'll send a shipping carton out promptly (at your expense). More information on packing can be found in the *Service* section of this manual. Also include a note explaining exactly how to duplicate the problem, a copy of the sales receipt with price and date showing, and your return street address (no P.O. boxes or route numbers, please!). If we cannot duplicate the problem at the Mackie Factory or establish the starting date of your Limited Warranty, we may, at our option, charge for service time.

3. Ship the product in its original shipping carton, *freight prepaid* to:

Mackie Designs Inc.
Service Department
16220 Wood-Red Road NE
Woodinville, WA, 98072, USA

IMPORTANT: Make sure that the RA number is plainly written on the shipping carton.
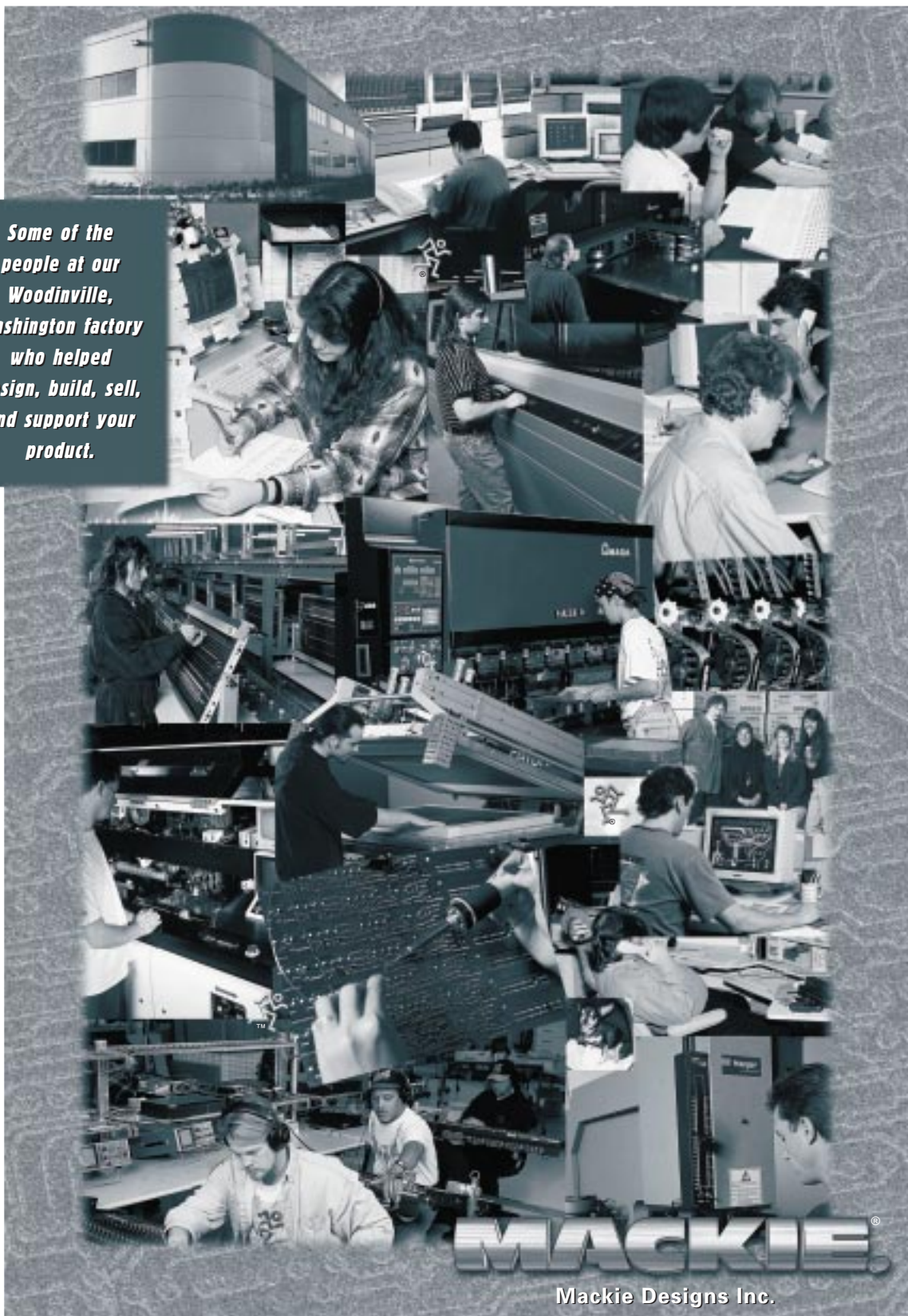
E. Mackie reserves the right to inspect any products which may be the subject of any warranty claims before repair or replacement is carried out. Mackie may, at its option, require proof of the original date of purchase in the form of a dated copy of the original dealer's invoice or sales receipt. Final determination of warranty coverage lies solely with Mackie Designs Inc.

F. Mackie products returned to Mackie and deemed eligible for repair or replacement under the terms of this warranty will be repaired or replaced within thirty days of receipt by Mackie at our rainforest factory complex. Products returned to Mackie that do not meet the terms of this Warranty will be repaired and returned C.O.D. with billing for labor, materials, return freight and insurance. Products repaired under warranty at Mackie's factory will be returned freight prepaid by Mackie to any location within the boundaries of the USA.

G. This warranty is extended to the original purchaser and to anyone who may subsequently purchase this product within the applicable warranty period.

H. This is your sole warranty. Mackie does not authorize any third party, including any dealer or sales representative, to assume any liability on behalf of Mackie Designs or to make any warranty for Mackie Designs.

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