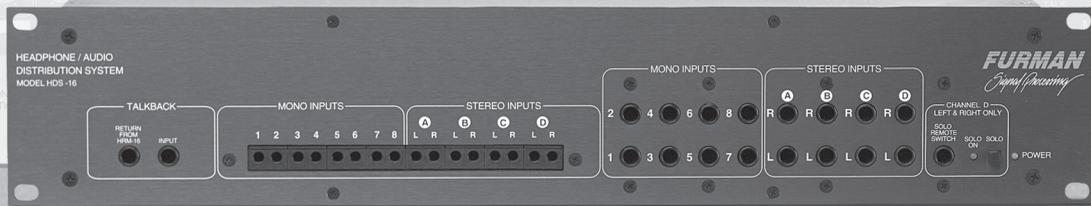


HEADPHONE / AUDIO
DISTRIBUTION SYSTEM
MODEL HDS-16

HDS-16

HRM-16

HEADPHONE/AUDIO DISTRIBUTION AND REMOTE MIXING SYSTEM



Owner's Manual

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INTRODUCTION

The HDS-16/HRM-16 Headphone/Audio Distribution System is the latest addition to the Furman Sound headphone/audio distribution product line. The HDS-16 distribution device sends signals to one or more HRM-16 remote mixers; the HDS-16 and HRM-16 are sold separately. This new system, although similar to our HDS-6/HR-6 system, offers more channels and several enhanced features that better meet the demands of both studio and live stage monitoring situations.

FEATURES

The HDS-16 accepts eight mono and four stereo inputs from a mixing console and routes them to each HRM-16 via a 50-pin Centronics cable. This cable also transports the DC power to each HRM-16 so they do not require a power cable or “wall wart.” Each HDS-16 has six Centronics outputs on the rear panel, and additional HRM-16’s can be daisy-chained together. A maximum of eight HRM-16’s can be driven from a single HDS-16. Since each HRM-16 can drive two headphone outputs, sixteen musicians can be supplied with eight different mixes from one HDS-16.

The HRM-16 is a 16-channel mixer with a powerful headphone amplifier. It also features a built-in microphone and talkback system that allows communication between each musician and the mix engineer in two modes:

- The Live/Stage Mode (default) allows the HDS-16 to communicate with all HRM-16’s. All HRM-16’s with their TALK buttons depressed can communicate with the HDS-16 but not with other HRM-16s.
- The Studio Mode establishes communication among all HRM-16’s and the HDS-16 much like an intercom system. The HRM-16 user presses their TALK button to speak to all other HRM-16’s and the HDS-16. This mode enables discussion between the musicians and mix engineer between takes. Turn to page 5 to see how to change modes.

A solo system allows the engineer to auto-

HDS-16/HRM-16 HEADPHONE DISTRIBUTION SYSTEM

matically mute all HRM-16 sends except the channel D stereo and talkback outputs. This unique feature allows each musician to hear a rough or final mix and send soloed tracks from the mix console. This eliminates the need for musicians to relocate to the control room or manually change their HRM-16 level settings.

Note: Both the solo function on the HDS-16 and the talkback system on the HRM-16 can be activated manually using their front panel controls or by optional remote switches.

ADDITIONAL USEFUL HRM-16 FEATURES INCLUDE

- local effects send and return;
- line out (mono);
- bass and treble shelving EQ controls;
- talkback level and master volume controls.

HDS-16 HEADPHONE/AUDIO DISTRIBUTION SYSTEM

The HDS-16, a 2-U rack-mountable device

normally located near the main mixing console, provides the power and signal conditioning for a maximum of eight HRM-16's. Individual channel sends from the console connect to the HDS-16 inputs.

FRONT PANEL

The front panel serves as the patch bay for all input connections: eight mono and four stereo ¼-inch and TT input connectors. All connectors are balanced and use the Tip/Ring/Sleeve (TRS) wiring convention. Both ¼-inch and TT connectors can be used but not for the same channel. If both connector types are used for the same channel, the TT connector will be active and ¼-inch connector will be disabled.

TALKBACK

Figure 2 shows the TALKBACK connectors at the far left of the front panel. Connect the mix console's line-level, talkback-microphone output or cue send to the HDS-16's ¼-inch INPUT jack. This signal is distributed to the HRM-16s on the Centronics cable along with the other channels. Use the RETURN FROM HRM-16

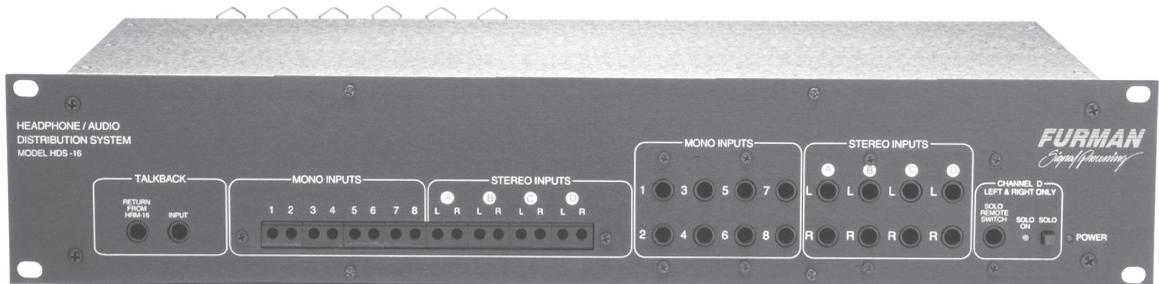


Figure 1: HDS-16 front panel

The front panel is shown above; the TT and ¼-inch input sections are shown in detail in Figure 2 and Figure 4, respectively. Note: Although the POWER indicator LED is located on the far right of the HDS-16 front panel, the AC power ON/OFF switch is on the rear panel.

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16's. Talkback is always available from the mix console and the level can be adjusted with the HRM-16's TALKBACK VOLUME control.

There are two talkback modes designed for live and studio situations:

LIVE/STAGE MODE (DEFAULT)

This mode establishes communication from the HDS-16 to all HRM-16's but not between them. Each HRM-16 user must depress their TALK button or switch to speak with the HDS-16 but can always receive from it. The HRM-16 users will not hear other HRM-16 users or their own voice. This is useful for live situations where a single HRM-16 user's communication with the mix engineer does not require interaction between musicians. Live/Stage was selected as the default mode to eliminate feedback from adjacent stage monitors.

STUDIO MODE

This mode establishes communication among all HRM-16's and the HDS-16 much like an intercom system. Any HRM-16 user with their TALK button depressed can speak to all HRM-16's and the HDS-16. Each person will also hear their own voice. This mode is useful to enable discussion between the musicians and mix engineer between takes.

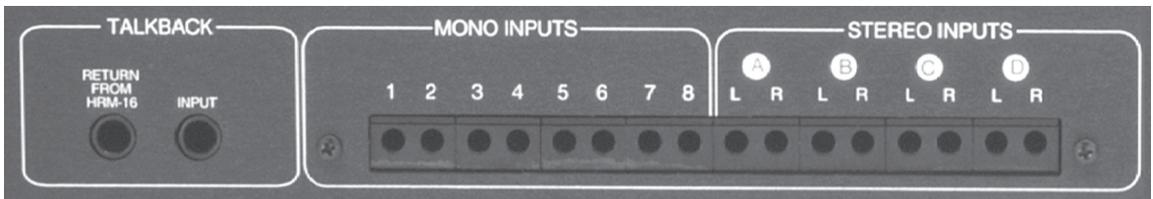


Figure 2: Detail of HDS-16 front panel: Talkback and TT inputs

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HDS-16 MAIN PCB - TOP VIEW (LEFT-FRONT CORNER - CUT AWAY)

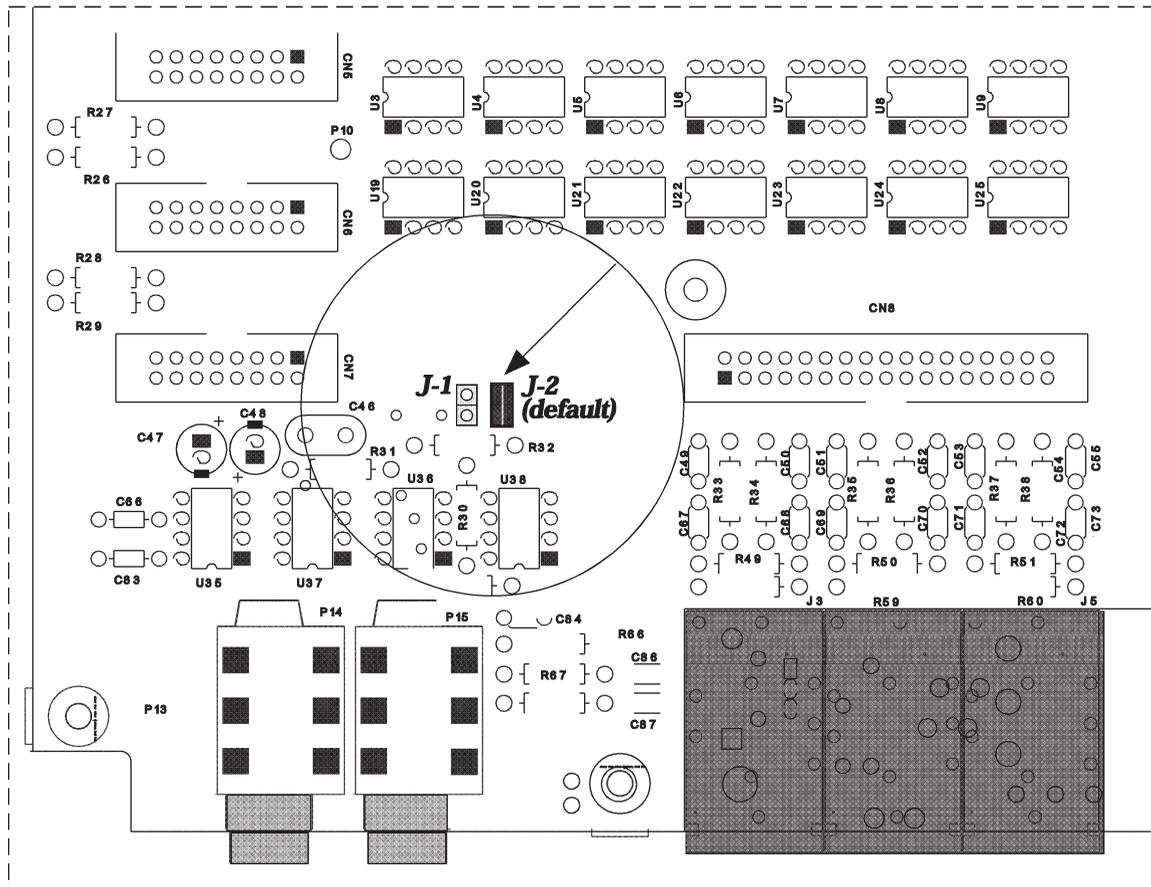


Figure 3: Changing the talkback mode inside the HDS-16

HDS-16/HRM-16 HEADPHONE DISTRIBUTION SYSTEM

CHANGING THE TALKBACK MODE

A jumper located inside the HDS-16 selects between two talkback modes.

1. Use a Phillips screwdriver to unscrew the middle two screws located near the top of the front panel and all screws on the top.
2. Remove the top cover. You will see the left-

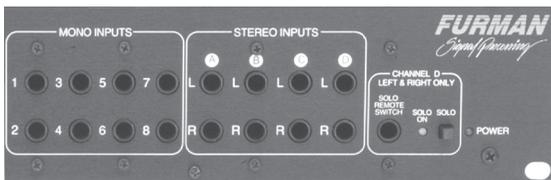


Figure 4: Detail of HDS-16 front panel: 1/4-inch inputs and Solo interface

- front corner of the main PCB.
3. Lift the jumper from the J-2 two-pin header and move it to J-1 to change the talkback mode from Live/Stage to Studio mode.

SOLO

This feature allows musicians at the HRM-16s to hear rough and final mixes or soloed tracks from the recording console without exiting to control room or manually altering the HRM-16's

level controls. The HDS-16 solo feature requires patching the mix console's main or mix output to the HDS-16's channel D input.

Note: After using the solo feature to listen to the main console mix between takes, turn the channel D level control off (to 0) on all HRM-16s before resuming recording. It is easy to forget to turn down channel D because you will still hear the intended channel mix but the main console mix will also be present.

Figure 4 shows the solo interface, labeled CHANNEL D LEFT & RIGHT ONLY because all HRM-16 outputs are muted when the SOLO button is depressed except Channel D. A switch can be plugged into the 1/4-inch SOLO REMOTE SWITCH connector to turn the solo function on/off. The SOLO ON LED indicator lights when the solo function is active.

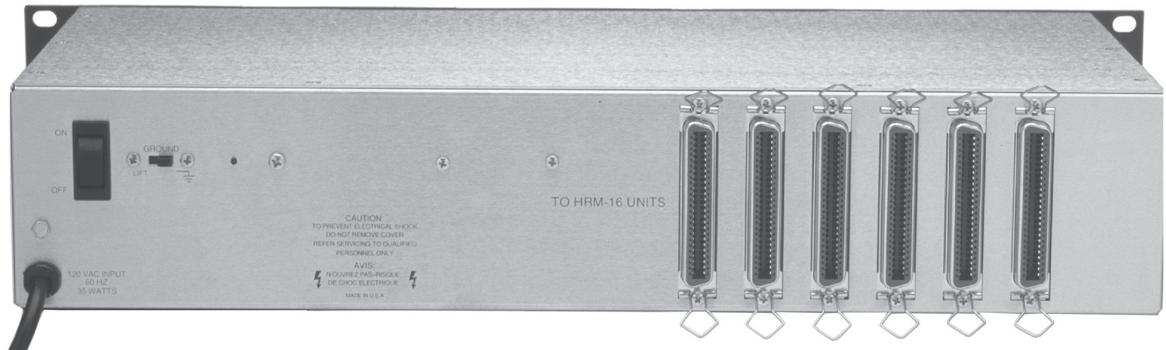


Figure 5: HDS-16 rear panel

HDS-16/HRM-16 HEADPHONE DISTRIBUTION SYSTEM

Note: The remote and front panel switches are wired in parallel. Although either switch can activate the SOLO function, both must be in the off position to deactivate it.

REAR PANEL

The HDS-16 rear panel has six, 50-pin, Centronics output connectors for the HRM-16s, AC-power, and ground switches (Figure 5). While male-to-male Centronics cables are available from computer retailers, Furman manufactures superior quality cables with twisted pair construction to optimize sound quality and reject cross-talk interference. We highly recommend using the 25 twisted pair, shielded, 25-ft cable supplied with each HRM-16. Contact Furman for other cable lengths and linking adapters.

Note: The maximum recommended cable run

is 200 ft. See Table 1 on page 8 for information about cable losses beyond 100 ft.

Push the AC-power switch up to the ON position to power the HDS-16.

The GROUND lift switch has two positions:

LIFT: Signal ground is separate from chassis ground. Earth ground (AC line cord) is connected to the chassis only.

GROUND: Signal ground is connected to chassis ground; use this setting unless there is hum or noise present.

Note: Be sure all units are turned off before connecting an HDS-16 to one or more HRM-16's.

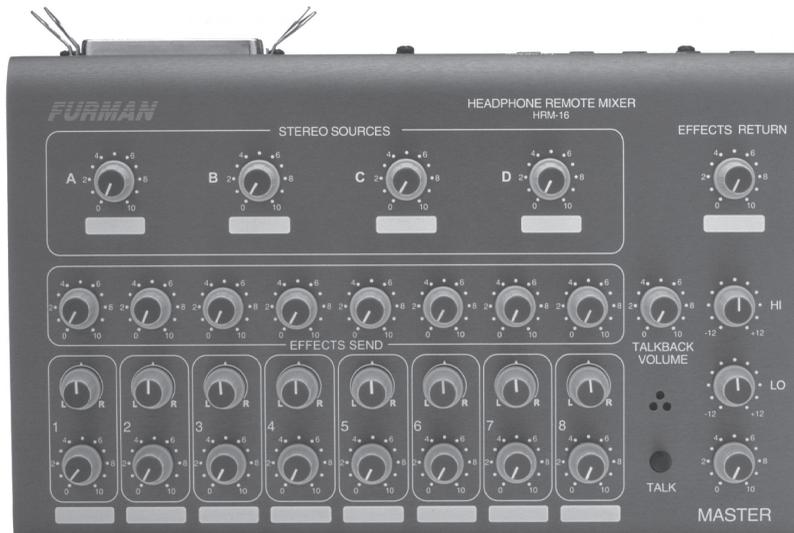


Figure 6: HRM-16 top panel

HDS-16/HRM-16 HEADPHONE DISTRIBUTION SYSTEM

HRM-16 REMOTE MIXER

The HRM-16s receive their input signals and power supply entirely through the Centronics cable from the HDS-16. Eight mono and four stereo channels can be mixed and monitored with headphones or sent to a monitor system. The eight mono channels may be routed to the EFFECTS SEND output on the rear panel. The effected signal is returned to the HRM-16 through the stereo effect returns on the rear panel and blended into the mix with the EFFECTS RETURN level control. The HRM-16 can be easily mounted on a microphone stand with the thumb screws and clip provided, or placed on a table or shelf.

TOP PANEL

The top panel provides:

- Level controls for four STEREO SOURCES;
- EFFECTS SEND, L/R pan, and level controls for each of eight mono channels;
- MASTER volume control;
- HI and LO shelving EQ controls with 12 dB boost and cut;

- TALKBACK VOLUME control, TALK button, and built-in microphone;
- EFFECTS RETURN level control.

TALKBACK

Press the TALK button and speak in the direction of the built-in microphone above the button (three small holes in the shape of a triangle). The microphone will pick up voices from up to six ft away so you do not need to speak directly into it. Use the TALKBACK VOLUME control to alter the level of incoming talkback information. See page 4 for a complete description of the talkback functions.

REAR PANEL

The HDS-16/HRM-16 system can be connected in parallel or series without compromising sound quality or power as long as no more than four HRM-16s are connected in series from a single HDS-16 output.

- Parallel: Each HRM-16 is connected directly to the HDS-16 in a star configuration.
- Series: One HRM-16 is connected directly to the HDS-16 with additional HRM-16's connected together in a daisy chain.

Two, 50-pin, Centronics connectors are located on the right of the HRM-16's rear panel:

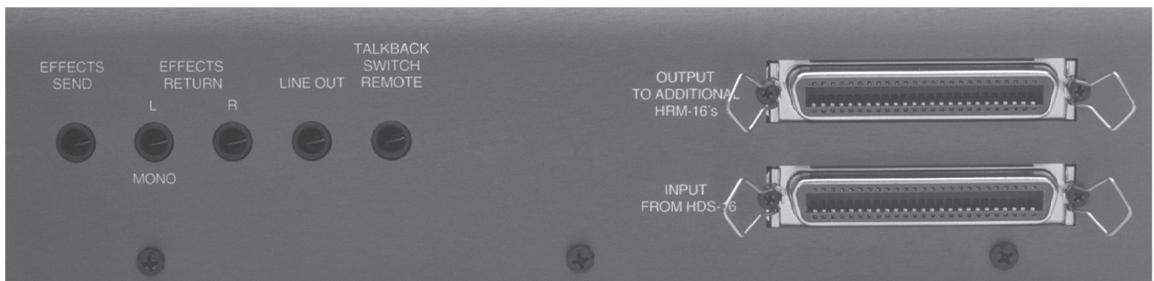


Figure 7: HRM-16 rear panel

HDS-16/HRM-16 HEADPHONE DISTRIBUTION SYSTEM

INPUT FROM HDS-16

This connector delivers the input signals and power supply from the HDS-16 (parallel) or from another HRM-16's OUTPUT TO ADDITIONAL HRM-16's connector (series).

The remaining rear panel inputs and outputs are ¼-inch TRS connectors.

- EFFECTS SEND: Connect this mono output to an effects processor.
- EFFECTS RETURN: Use the L input for a mono return (panned center) or L and R inputs for stereo effects.
- LINE OUT: Use this mono, line-level output to route the HRM-16 to a monitor system. The LINE OUT and headphone signals are both affected by the MASTER VOLUME and HI/LO EQ controls.
- TALKBACK SWITCH REMOTE: Plug a momentary switch into this jack to use instead of (or in addition to) the TALK button.

OUTPUT TO ADDITIONAL HRM-16'S

This connector carries the same signal sent to the INPUT FROM HDS-16 connector. Connect this output to another HRM-16's INPUT FROM HDS-16 connector to achieve a series connection. An output that simply replicates the input is often called input through because the signal is sent out before being processed in the device. As a result, the HRM-16's top panel controls do not affect the OUTPUT TO ADDITIONAL HRM-16's signal.

HDS-16 AND HRM-16 PROTECTION CIRCUITS

Headphone Impedance	Power Loss per 100 feet of Cable
32	-0.34 dB 693 mW vs. 750 mW
100	-0.16 dB 746 mW vs. 770 mW
600	-0.34 dB 257 mW vs. 260 mW

Table 1: Centronics cable losses per 100 feet

HRM-16

The headphone driver and power supply regulators are protected against over-temperature and current overloads. The regulated power delivered from the HDS-16 to the HRM-16 is protected against over-current by PolySwitch resettable fuses inside each HRM-16. These fuses prevent a defective HRM-16 from shutting down the HDS-16 or attached HRM-16s. Both devices reset automatically after clearing the fault and removing power to the circuit.

HDS-16

The regulated power delivered from the HDS-16 to the HRM-16 is protected against shorted cables by an over-current crowbar circuit. The affected power supply turns off in response to an over-current condition. Restore normal operation by removing the defective cable or HRM-16 and turn off the power to the HDS-16 for at least 30 seconds.

The AC-line fuse is a 1-Amp Slo-Blo. Replace it only with a fuse of the same type and rating.

THREE YEAR LIMITED WARRANTY

Furman Sound, Inc., having its principal place of business at 1997 South McDowell Blvd., Petaluma, CA 94954 (“Manufacturer”) warrants its HDS-16/HR-16 (the “Product”) as follows:

Manufacturer warrants to the original Purchaser of the Product that the Product sold hereunder will be free from defects in material and workmanship for a period of three years from the date of purchase. The Purchaser of the product is allowed fifteen days from the date of purchase to complete warranty registration by mail or on-line at the Furman website. If the Product does not conform to this Limited Warranty during the warranty period (as herein above specified), Purchaser shall notify Manufacturer in writing of the claimed defects. If the defects are of such type and nature as to be covered by this warranty, Manufacturer shall authorize Purchaser to return the Product to the Furman factory or to an authorized Furman repair location. Warranty claims should be accompanied by a copy of the original purchase invoice showing the purchase date; this is not necessary if the Warranty Registration was completed either via the mailed in warranty card or on-line website registration. Shipping charges to the Furman factory or to an authorized repair location must be prepaid by the Purchaser of the product. Manufacturer shall, at its own expense, furnish a replacement Product or, at Manufacturer’s option, repair the defective Product. Return shipping charges back to Purchaser will be paid by Manufacturer.

THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IM-

PLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Manufacturer does not warrant against damages or defects arising out of improper or abnormal use of handling of the Product; against defects or damages arising from improper installation, against defects in products or components not manufactured by Manufacturer, or against damages resulting from such non-Manufacturer made products or components. This warranty shall be cancelable by Manufacturer at its sole discretion if the product is modified in any way without written authorization from Furman Sound. This warranty also does not apply to Products upon which repairs have been affected or attempted by persons other than pursuant to written authorization by Manufacturer.

THIS WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of Manufacturer shall be to repair or replace the defective Product in the manner and for the period provided above. Manufacturer shall not have any other obligation with respect to the Products or any part thereof, whether based on contract, tort, strict liability or otherwise. Under no circumstances, whether based on this Limited Warranty or otherwise, shall Manufacturer be liable for incidental, special, or consequential damages. Manufacturer’s employees or representatives’ ORAL OR OTHER WRITTEN STATEMENTS DO NOT CONSTITUTE WARRANTIES, shall not be relied upon by Purchaser, and are not a part of the contract for sale or this limited warranty. This Limited Warranty states the entire obligation of Manufacturer with respect to the Product. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

HDS-16/HRM-16 HEADPHONE DISTRIBUTION SYSTEM

SERVICE

Before returning any equipment for repair, please be sure that it is adequately packed and cushioned against damage in shipment, and that it is insured. We suggest that you save the original packaging and use it to ship the product for servicing. Also, please enclose a note giving your name, address, phone number, e-mail address (if applicable), and a description of the problem.

All equipment being returned for repair must have a Return Authorization (R/A) Number. To get a R/A number, please call the Furman Service Department at (707) 763-1010 ext. 120 or 121, between 8 a.m. and 5 p.m., U.S. Pacific Time. Please display your R/A Number prominently on the front of all packages.

HDS-16 SPECIFICATIONS

INPUTS

Balanced, 50 k Ω , 90 dB CMRR

INPUT IMPEDANCE

50 k Ω

LINE OUTPUTS

Balanced or singled ended, 50 Ω , 68 dB OCMR

SINGLE CHANNEL GAIN

21 dB; +4 dBu for maximum output

REMOTE SWITCH

Connect tip to ring to mute all outputs except channel D (solo function)

SIZE

3.5" H x 19.0" W x 8.0" D

WEIGHT

9.4 lb (4.27 kg)

HRM-16 SPECIFICATIONS

LINE OUTPUTS

Balanced or single ended, 50 Ω , 68 dB OCMR

POWER OUTPUT

750 mW at 32 Ω , 770 mW at 100 Ω , 260 mW at 600 Ω

REMOTE SWITCH

Connect tip to ring to activate the talkback microphone

SIZE

2.9" H x 11.0" W x 7.0" D

WEIGHT

3.5 lb (1.59 kg)

HDS-16 AND HRM-16 SYSTEM SPECIFICATIONS

DISTORTION AND NOISE

< 0.002% THD+Noise, 20 Hz - 20 kHz at full rated power

DYNAMIC RANGE

> 105 dB

FREQUENCY RESPONSE

+0/-1 dB 13 Hz - 32 kHz

POWER REQUIREMENTS

HDS-16: 120 VAC, 60 Hz, 82 W; HDS-16E: 230 VAC, 50 Hz, 82 W

CROSSTALK

< -95 dB at 10 kHz

FURMAN

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