



# MD SERIES

Owners Manual  
and  
Installation  
Guide



# merlin<sup>2</sup>

## **Congratulations**

on your selection of a U.S.Amps MD series amplifier. We take pride in manufacturing our products and you can expect your new amplifier to give you years of trouble-free service.

To make your installation as easy and reliable as possible, please read this manual carefully before beginning.

If you need more information, your U.S.Amps Dealer will be glad to help.

## **Milestone**

- 
- 1986 *Founded in Gainesville, Florida, USA*
  - 1988 *First "no negative feedback" amplifier  
First one-half ohm stable amplifier  
"Magnetic Loop Regulation"*
  - 1991 *First dual-board amplifiers  
"Power amplifier strapping"  
Plexiglas panel*
  - 1992 *"Vari-loud" tone filters  
First class "D" amplifier at the IASCA Finals*
  - 1995 *Mirror-polished heat sink*
  - 1996 *First dual-torroid master/slave MOSFET power supply*
  - 1997 *XTERMINATOR*
  - 1998 *"Smart Amp Technology"(SAT)*
  - 2000 *TRUE DIGITAL full-range stereo performance*
  - 2001 *Utilize the vacuum tube*
  - 2002 *Takes a solid step into multi-channel amplifiers*
  - 2003 *"Class DE" Digital Amplifiers*
  - 2005 *New lines of products: Merlin2, IS, and AX-Series  
New facility in California, USA*
  - 2006 *XTERMINATOR is BACK!  
Introducing "Multi-Link Technology"(MLT)*
  - 2007 *Whole NEW design of Merlin2 series*

## CONTENTS

- 1 ..... **Congratulations / History(Milestone)**
- 2 ..... **TOC / Genuine Power**
- 3 ..... **Features & Installation**
- 4 ..... **Basic Wiring**
  - **2-channel / Monoblock**
  - **4-channel**
- 5 ..... **Bridged Wiring**
  - **2-channel**    • **4-channel**
  - **Monoblock(MLT wiring)**
- 7 ..... **Specifications**
- 8 ..... **Troubleshooting**
- 9 ..... **Caution / For Better Listening Experience**
- 10 ..... **Memo**
- back ..... **Limited Warranty**

## Genuine Power

*U.S.Amps is a manufacturer of reliable, high-power quality car audio amplifiers and accessories.*

*What is your expectations?*

*U.S.Amps will meet your needs and provide you with genuine power and accurately reproduced sound.*

*No other company offers a wide range of high quality purpose-designed amplifiers as we do.*

*Discover the secret of car audio professionals and serious sound enthusiasts. For 21 years, U.S.Amps has defined the standard of amplifier quality and power. High performance listeners agree: the best systems are built on a rock solid foundation of U.S.Amps.*

*Designed and hand-crafted in our Florida Factory, U.S.Amps are the finest car amplifiers ever built. All U.S.Amps products are uniquely designed and carefully engineered to allow for maximum versatility and dependability.*

## FEATURES

### POWER SUPPLY

- High-current MOSFET devices
- MMT-regulated Power Supplies
- 35 nanosecond Switching Diodes
- High capacity Power Transformer
- Multiple Bypass Capacitors on incoming 12V supply
- Time Delay Turn-on with Opto-coupled Muting Circuits
- Power supplies use Pulse-width Modulation
- Thermal and Reverse Polarity Protection

### AMPLIFIERS

- High efficiency Class D design(1D/2D/3D)
- Output stages utilize high-current MOSFET devices
- High speed, audio-grade components in all low-level stages
- Active Constant Current Bias Tracking Circuit
- Platinum-plated RCA inputs and connectors
- Wide range of sensitivity accepts signal from any head unit
- 24dB/octave Subsonic Crossover
- 24dB/octave Lowpass Crossover
- True Line Output
- Auto Bridge feature
- Short Circuit Protection

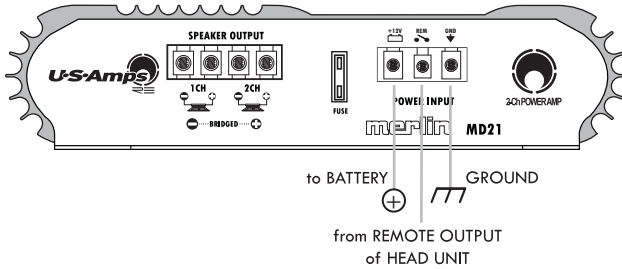
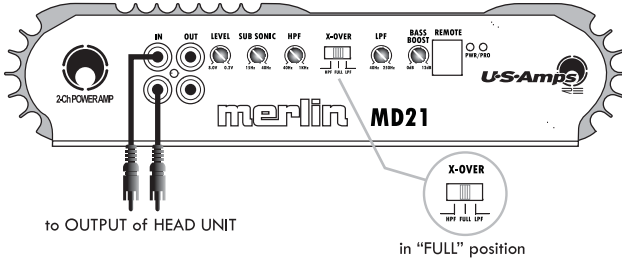
## INSTALLATION

- Use at least 8-gauge wire for power and ground connections
- Use at least 12-gauge wire for speaker connections
- Use at least 16-gauge wire for remote connection
- Mount the amplifier where it can receive the best ventilation
- Use the shortest ground connection to the chassis of the vehicle and make sure that the paint is removed at the connection point
- Connect the remote input to the remote/antenna output of the head unit
- Mount the fuse holder within 200mm(8") of the vehicle's battery. Use a fuse equal to that specified for your amplifier if a large, single +12V line is run which feeds more than one amplifier add up all required fuse ratings and use the total rating for the fuse
- Connect the speaker to the amplifier observing the correct phasing. Make sure that none of the speaker connections can touch the vehicle chassis
- Connect the RCA inputs to the appropriate signal source using only the highest quality RCA cables
- Make sure that the RCA and speaker cables do not run parallel to the +12V wiring

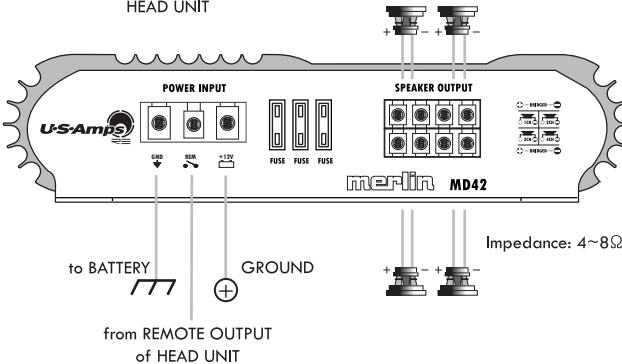
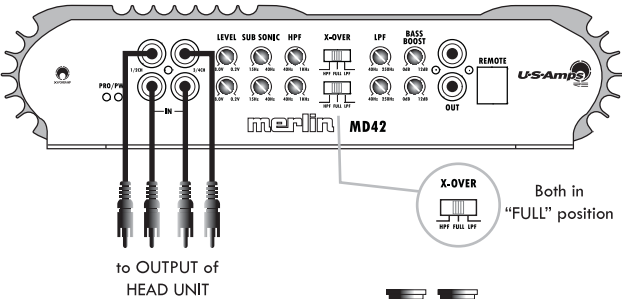
# CONNECTIONS

## [Basic Wiring]

### ▲ 2-channel [MD21] and Monoblock [MD1D/2D/3D] Amplifiers



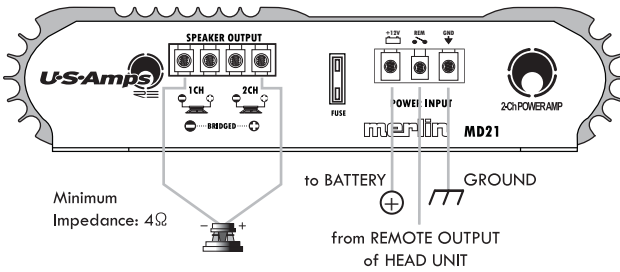
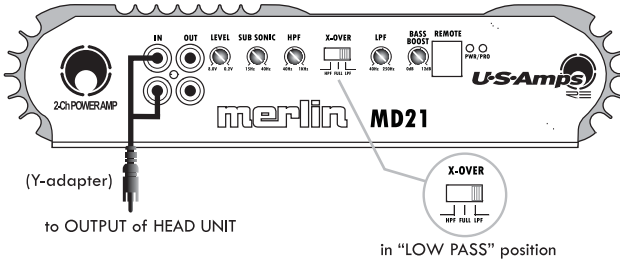
### ▲ 4-channel [MD42/43] Amplifiers



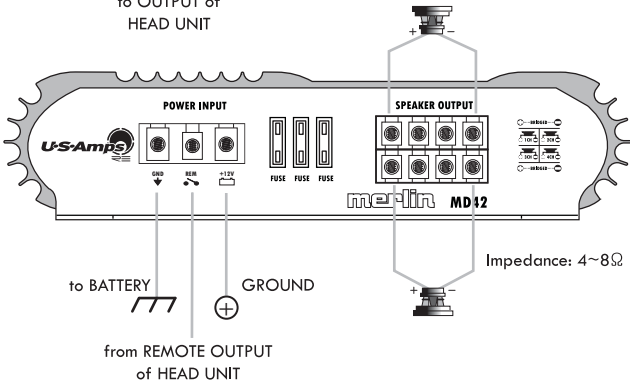
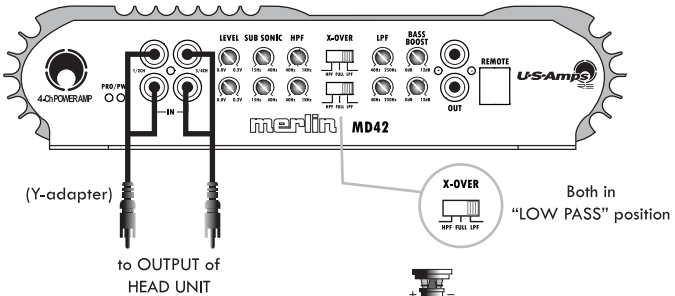
# CONNECTIONS

## [Bridged Wiring]

### ▲ 2-channel [MD21] Amplifier



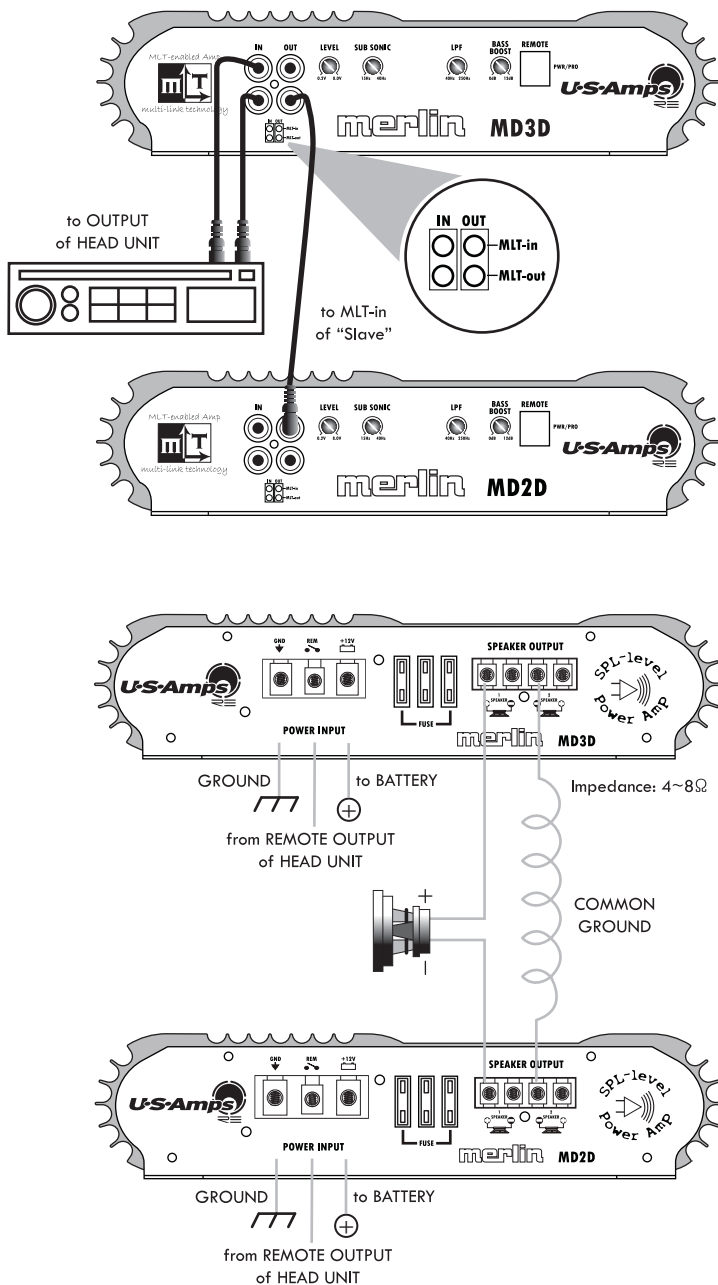
### ▲ 4-channel [MD42/43] Amplifiers



# CONNECTIONS

## [MLT Wiring] - Master/Slave

▲ for Monoblock [MD1D/2D/3D] Amplifier only



# SPECIFICATIONS

			MD21	MD42	MD43	MD1D	MD2D	MD3D
Power Output (RMS)	4Ω	@ 12V @ 14.4V	2 x 75	4 x 75	4 x 100	1 x 200 1 x 400	1 x 300 1 x 550	1 x 500 1 x 650
	2Ω	1KHz 100Hz	2 x 100	4 x 90	4 x 150	1 x 750	1 x 1000	1 x 1200
	1Ω	100Hz				1 x 1200	1 x 1500	1 x 2000
	4Ω mono	1KHz	1 x 200	2 x 180	2 x 300			
Total Harmonic Distortion	4Ω	1KHz	0.03	0.03	0.03	0.09	0.09	0.09
S/N Ratio	Input Short	4Ω	105	100	100	80	80	80
Channel Separation @ 4Ω RMS	1KHz	1KHz	95	83	80	N/A	N/A	N/A
Frequency Response			10~30K	10~30K	10~30K	20~250	20~250	20~250
Power Band Width (Frequency Response)			10	10	10	20~500	20~500	20~500
		-1dB	50	50	50	•••	•••	•••
Crossover Frequency	Low Pass	24dB	40~250	40~250	40~250	40~250	40~250	40~250
	Subsonic	24dB	15~40	15~40	15~40	15~40	15~40	15~40
	High Pass	12dB	•••	•••	•••	40~1K	40~1K	•••
Bass Boost Control @ 45Hz		0~12	0~12	0~12	0~12	0~12	0~12	
Wired Remote Control			Yes	optional	optional	Yes	Yes	Yes
Bridged Mono Capable		Ω	4	4	4	•••	•••	•••
Master Slave Capable			•••	•••	•••	Yes	Yes	Yes
Gain Control			Yes	Yes	Yes	Yes	Yes	Yes
Input Sensitivity	Low Level	1KHz	200/8.0	200/8.0	200/8.0	200/8.0	200/8.0	200/8.0
	High Level	1KHz	V					
Input Impedance	Low		10	10	10	22	22	22
	High							
Damping Factor			600	400	400	100	100	100
Dimensions [(W) 2.5/63.5(H) x 10.5/280(D) in/mm]			10.75/273	15.75/400	19.75/502	14.5/368	18.25/464	21.75/553
Fuse Rating			30A x 1	30A x 3	30A x 3	30A x 3	40A x 3	40A x 6
Protection (thermal, overload, short circuit, dc offset)			Yes	Yes	Yes	Yes	Yes	Yes
Power Voltage Range		V	12~16V	12~16V	12~16V	12~16V	12~16V	12~16V

# TROUBLESHOOTING

**Before removing your amplifier, refer to the list below and follow the suggested procedures. Always test the speakers and their wires first.**

## No Output

- Confirm that all terminal strip connections are secure and tight.
- Check both in-line and built-in fuses.
- Confirm that the audio signal source (car radio, equalizer, etc) is connected and is supplying output signal. To check if the amplifier is supplying signal, unplug the RCA cables from the signal source (but leave them plugged into the amp) and briefly tap the center pin of each of the disconnected RCA plugs with your finger. This should produce a noise (feedback) in your speakers.

## Only one channel works

- Confirm that all terminal strip connections are secure and tight.
- Check the “BALANCE” control on the head unit (or other source) to verify that it is set to its mid point.
- If you are using the low-level RCA input, reverse the input plugs at the amplifier (switch the R with the L). If the channel which is silent switches to the other side, the problem is either in the head unit/other source or the connecting cables.

## Weak output

- Re-adjust the Input Level Control to better suit the input signal.

## Noise in the audio

- If the noise is a “whine” whose pitch follows the engine speed, confirm that the amplifier and any other signal sources (head unit, equalizer, etc) are properly grounded.
- If the noise is a “clicking” or “popping” noise whose rate follows the engine speed, this usually means that the vehicle is equipped with resistor spark plugs and wires, or that the ignition is in need of service.
- Check the routing of the speaker and input wires to make sure they are not adjacent to wires which interconnect with lights and other accessories.
- If the above steps fail to improve or clear noise interference, the system should be checked by an authorized **U.S.Amps** Dealer.



## Caution !

Jump starting your vehicle can cause large voltage spikes within your automobile's electrical system. To prevent damage to your stereo system, make sure the entire system is shut down until full battery charge has been reached and jumper cables have been removed from the battery.

## We want you listening for a lifetime!

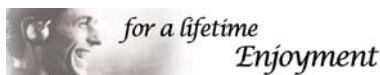
Used wisely, your new Merlin will provide a lifetime of fun and enjoyment. Since hearing damage from loud sound is often undetectable until it is too late, U.S.Amps and the Electronic Industry Association's Consumer Electronics Group recommend you avoid prolonged exposure to excessive loud sound.

<b>dB level</b>	<b>Examples</b>
30	Quiet library, soft whispers
40	Living room, refrigerator, away from traffic
50	Light traffic, normal conversation, quiet office
60	Air conditioner at 20 feet, sewing machine
70	Vacuum cleaner, hair dryer, noisy restaurant
80	Average city traffic, garbage disposal, alarm clock at 2 feet

### The following noises can be dangerous under constant exposure

90	Subway, motorcycle, truck traffic, lawn mower
100	Garbage truck, chain saw, pneumatic drill
120	Rock band concert in front of speakers, thunderclap
140	Gunshot blast, jet plane
180	Rocket launching pad

*Information courtesy of the Deafness Research Foundation*



# MEMO

Model #:

Serial #:

Purchased Date:

Purchased From:

Write down key information of your Merlin amplifier(s) as noted above. Please refer this information when you need assistance from our technical support or RA service. You can find important warranty information on the back cover.

---

## Limited Warranty:

U.S.Amps warrants all manufactured electronic products to be free from defects in material and workmanship for a period not to exceed ONE YEAR from the date of purchase.

**IMPORTANT WARRANTY NOTICE:** U.S.Amps will only warrant and service products displaying valid U.S.Amps serial numbers. WARRANTY SERVICE WILL ONLY BE PERFORMED WHEN THE UNIT IS ACCOMPANIED BY A COPY OF THE ORIGINAL SALES RECEIPT FROM AN AUTHORIZED DEALER. All product returned to U.S.Amps for service MUST be accompanied by a Return Authorization Number, issued by U.S.Amps in advance of shipment. The Return Authorization Number must be clearly and conspicuously displayed on the shipping carton or U.S.Amps will refuse delivery.

For Return Authorization Numbers, first call your U.S.Amps dealer you purchased the products from. The dealer will help you to obtain Return Authorization Numbers.

This warranty extends only to the original purchaser and is not transferable. Defective equipment must be returned within the warranty period, freight prepaid, to the U.S.Amps Factory or an Authorized U.S.Amps Warranty Station.

This warranty covers only defects in materials and workmanship of manufactured electronic products (amplifiers). Incidents of misuse, abuse, neglect, or unauthorized modification will not be covered within the terms of this warranty.

U.S.Amps reserves the right to refuse warranty service under such conditions.

U.S.AMPS WILL NOT BE RESPONSIBLE FOR ANY DAMAGES, WHETHER INCIDENTAL OR CONSEQUENTIAL, RELATED TO THE USE OF THIS OR ANY OTHER PRODUCT BEARING OR SOLD UNDER THE U.S.AMPS BRAND NAME. USE THIS PRODUCT AT YOUR OWN RISK. IMPROPER USE OF THIS PRODUCT CAN RESULT IN PROPERTY DAMAGE, BODILY HARM, AND OR OTHER DAMAGE. U.S.AMPS ASSUMES NO RESPONSIBILITY FOR YOUR HEALTH OR SAFETY.

