Cat. No. 12-1977

OWNER'S MANUAL

Please read before using this equipment.

85 4 High Power 4-Channel Trunk Mount Amplifier

FEATURES

Your Optimus 85 × 4 High Power 4-Channel Trunk Mount Amplifier is designed to produce a total of 340 watts to give added punch and power to your vehicle's existing stereo system.

The amplifier produces up to 85 watts per channel of clean, powerful sound at all audio frequencies with minimum distortion. You can adjust the crossover frequency for both channels 3 and 4 when using only two speakers and a subwoofer, so you can emphasize the bass sounds but not lose the other sounds or power. You can connect your autosound system's line-level or speaker level outputs to the amplifier.

Its features include:

14k Gold-Plated Noise-Isolated Line-Level Input Jacks - let you connect low-level (pre-amplifier) signal inputs to match your autosound system's output for the best high-fidelity performance.

14k Gold-Plated Speaker Terminals - designed for low impedance, high conductivity, and minimum corrosion to provide the highest signal transfer and lowest sound distortion.

Input Level Controls - let you adjust the level of the audio signals that enter the amplifier.

Automatic Power Switching - automatically turns on/off the amplifier when you turn on/off your autosound system.

Bridging Capability - lets you combine the amplifier's four 85-watt channels so you can use the system with only two channels that produce a total of 170 watts from each channel.

Crossover Frequency Circuit - lets you adjust the crossover frequency from 45-400 Hz for both channels three and four when you use only two speakers.

Crossover Frequency ON/OFF Switch - lets you set the amplifier to drive a connected subwoofer.

Automatic Thermal Protection System (ATPS) - automatically lowers the amplifier's output power when the amplifier's internal temperature reaches 202×F then increases the output power when the amplifier cools down.

Mute Turn On Circuit - eliminates the irritating thump noise that some amplifiers produce when you turn them on.

Power Indicator - lights when power is on.

Full MOSFET Power Supply - produces enough power to supply the main amplifier and has a considerable amount of reserve power for peak "high demand" situations.

Short Circuit Protection - distorts sound if any output channel shorts so you can know to turn off the amplifier.

Important: Be sure your speakers can handle 340 watts of power (170 watts per channel if you connect the autosound system to one pair of speakers, or 85 watts per channel if you connect the autosound system to two pairs of speakers). Each speaker must have an impedance of at least 4 ohms. Your local Radio Shack store carries a full line of speakers.

Note: If the connectors on your vehicle stereo system are not compatible with the amplifier's connectors, your local Radio Shack store sells adapter harnesses for many vehicles.

CONTENTS

PREPARATION

CHOOSING A MOUNTING LOCATION

The ideal location for mounting the amplifier is in your vehicle's trunk. Wherever you decide to mount it, choose a mounting location that:

- Does not interfere with the vehicle's operation.
- Lets you drill mounting holes without damaging other vehicle components.
- Allows enough space around the cooling fins for proper airflow and cooling.

Warning: The amplifier gets very hot while it is on. Do not touch the amplifier or place flammable objects near it while it is on.

BEFORE YOU BEGIN THE INSTALLATION

Before you install your amplifier, carefully read all the instructions in this owner's manual. You should be able to answer all of these questions about your vehicle's electrical and sound systems.

- Does my vehicle have a 12-volt negative ground system? (If it does not, you cannot use this amplifier.)
- Which of the amplifier's wires is the power wire?
- How do I connect a wire to the fuse box?
- Which amplifier terminals are line-level inputs, which are speaker-level inputs, and which are speaker outputs?

Important!

- Be aware that installation in your vehicle may require cutting or modifying your vehicle.
- Do not cut any of the amplifier's wires. If you cut any wire, you cannot obtain a refund or exchange on this product. Radio Shack will provide warranty service if you cut a wire and find the product is defective.

Cautions:

- To prevent damage to your amplifier or autosound system, you must first connect the ground, primary, and switched power wires (as described in "Connecting Ground and Primary/Switched Power") before you connect the speakers to the amplifier. Make the connections only in the order shown. Damage to the amplifier is possible if you connect any wire incorrectly.
- Turn on the power to test the connections before you permanently mount the amplifier (see "Testing the Power Connections").
- Be sure your speakers can handle 85 watts per channel, if you connect the autosound system to two pairs of speakers (or 170 watts per channel if you connect the autosound system to only one pair of speakers). Each speaker must have an impedance of at least 4 ohms. Your local Radio Shack store carries a full line of speakers to choose from.

CONNECTING GROUND AND PRIMARY/SWITCHED POWER

1. To prevent damage to your amplifier or autosound system while making the connections, disconnect the negative (–) cable from your vehicle's battery.

   Note: After you complete the connections and reconnect the battery wire, you will need to reset all clock/timer/memory devices in your vehicle.

2. Securely connect the supplied dark blue/white wire's spade connector end to the amplifier's **REM** (remote power) terminal.

(illus - please add a dwg that illustrates step 3)

3. Connect the dark blue/white wire's other end to your autosound system's switched power lead using a twist-on terminal connector (such as Cat. No. 64-3057, not supplied).

   Note: If your autosound system does not have a remote power output lead, connect this wire to a point in your vehicle's fuse box that provides 12-volt battery power when the ignition is set to ON or ACC.This connection turns on the amplifier when you turn your ignition switch to on (or to ACC) and turns off the amplifier when you turn off the ignition.

4. Connect the black wire's eyelet/spade terminal end to the amplifier's two **GND** terminals.

5. Securely connect the black wire's eyelet-terminal to a nearby metal ground, such as a bolt attached to a part of the vehicle's chassis.

   Note: Be sure the bolt is not insulated from the chassis by a plastic part or other insulating material.

6. Connect the red wire's eyelet/spade terminal end to the amplifier's two **+12V** terminals.

7. Remove the nut from the positive (+) cable's terminal bolt, mount the red wire's 50A fused eyelet terminal on the bolt, then replace and tighten the bolt.

(illus - please add a dwg that illustrates step 7)

   Caution: Due to the amplifier's high current requirement, you MUST connect the red wire's fused end directly to the vehicle's positive (+) battery cable terminal bolt or damage to your vehicle's wiring could result.

   Note: Do not reconnect your vehicle battery's negative (–) cable yet.

CONNECTING TO YOUR AUTOSOUND SYSTEM

Low Level Input Connections

You can connect your autosound system's low-level phono output jacks to the amplifier's low-level phono input jacks. For the best results, use shielded audio cables, such as Cat. No. 42-2368 (not supplied).

Note: For a cleaner, less noisy signal transfer between your autosound system and the amplifier, the amplifier's low input phono jacks are gold-plated.

1. Temporarily place the amplifier as close as possible to the selected mounting location.
2. *If your autosound system has four phono outputs and you are using four speakers*, connect the autosound system to the amplifier using audio cables as follows: front-left to **CH1**, front-right to **CH2**, rear-left to **CH3**, and rear-right to **CH4.**:

If your autosound system has four phono outputs but you are using only two speakers (front or rear), connect only the autosound system's corresponding output jacks to the amplifier using audio cables as follows:

- front-left to **CH1** and front-right to **CH2**, or
- rear-left to **CH3** and rear-right to **CH4**

If your autosound system has only two phono output jacks (left and right) and you are using four speakers, use two Y-adapter audio cables to make the connections as follows:

Note: For the best results, use shielded phono plug-to-phono plug Y-adapter audio cables, such as Cat. No. 42-2368 (not supplied).

- Connect one of the Y-adapter's double phono plug ends to the amplifier's **CH1** phono jack.
- Connect the other double phono plug end to the amplifier's **CH3** phono jack.
- Connect the single phono plug end to the autosound system's left output jack.
- Connect one of the other Y-adapter's double phono plug ends to the amplifier's **CH2** phono jack.
- Connect the other double phono plug end to the amplifier's **CH4** phono jack.
- Connect the single phono plug end to the autosound system's right output jack.

If your autosound system has only two phono output jacks (left and right) and you are using only two speakers, simply connect them to the amplifier's corresponding **CH1** and **CH2**, or **CH3** and **CH4,** phono jacks.

High-Level Input Connections

If your autosoiund system has only speaker outputs, you can connect them to the amplifier's **HIGH INPUT CH4 CH3** and **HIGH INPUT CH2 CH1** sockets using the floating ground connection or the common ground connection method.

If your autosound system has four speaker outputs and you are going to use four speakers:

Floating Ground Connection

Common Ground Connection

If your autosound system has only two speaker outputs and you are going to use four speakers:

Floating Ground Connection

Common Ground Connection

CONNECTING THE SPEAKERS

With the speakers placed in their approximate locations, run one speaker wire from each speaker to the amplifier. We recommend you use 16- or 18-gauge marked or color-coded wires to help you correctly connect the speakers to your amplifier. For the maximum bass response and the best overall performance, keep your speakers properly phased (connect + to + and - to -).

Caution: Do not connect the speakers' negative (-) terminal wires to chassis ground.

Note: Speaker wires have two conductors. Color-coded wires have a stripe running down one of the conductors or different colored insulation for each conductor. Your local Radio Shack store has a wide selection of speaker wire to choose from.

Preparing the Speaker Wires

1. Separate each speaker wire's two conductors at both ends for a length of about 4 inches.
2. Strip the insulation from the ends of each conductor to expose 1/4 inch of wire.

   Note: Be sure to twist the ends to secure loose strands.

(illus - add a single drawing that illustrates steps 1 and 2, including the Step 2 note)

Connecting Four Speakers

1. Connect one end of a speaker wire's marked conductor to the amplifier's **CH1 +** terminal (front-left positive).
2. Connect the unmarked conductor's end to the amplifier's **CH1 -** terminal (front-left negative).
3. Repeat Steps 1 and 2 to connect another speaker wire to the amplifier's **CH2** (front-right) terminals.
4. Repeat Steps 1-3 to connect speaker wires to the amplifier's **CH3** (rear-left) and **CH4** (rear-right) terminals.
5. Connect the other ends of the four speaker wires so **CH1** connects to the front-left speaker, **CH2** to the front-right speaker, **CH3** to the rear-left speaker, and **CH4** to the rear-right speaker.

Connecting Two Speakers (Unbridged Connection)

If you are connecting only two speakers, you can connect them to the amplifier's front (**CH1** and **CH2**) or rear (**CH3** and **CH4**) speaker terminals.

Caution: This is an unbridged connection that produces 85 watts per channel. If you do not have high power speakers, use this connection.

1. Connect one end of a speaker wire's marked conductor to the amplifier's **+ CH1** (front-left positive) or **+ CH3** (rear-left positive) terminal.
2. Connect the unmarked conductor's end to the amplifier's **CH1 –** (front-left negative) or **CH3 –** (rear-left negative) terminal.
3. Repeat Steps 1 and 2 to connect speaker wires to the amplifier's **CH2 +** and **– CH2** (front-right) or **CH4 +** and **– CH4** (rear-right) terminals.
4. Connect the other ends of the speaker wires so **CH1** (or **CH3)** connects to the left speaker and **CH2** (or **CH4**) connects to the right speaker.

Connecting Two Speakers (Bridged Connection)

If you are connecting only two speakers (left and right), you can add (bridge) the power output of two channels (front and back) to produce the combined power of both from each of the two speakers.

Caution: This is a bridged connection that produces 170 watts per speaker. Use this connection only if you have high quality speakers capable of handling a power output of 170 Watts.

1. Connect one end of a speaker wire's marked conductor to the amplifier's **+ CH1** (**+ Bridged)** terminal and the other end to the left speaker's positive (**+**) terminal.
2. Connect the unmarked conductor's end (in the same speaker wire) to the amplifier's **CH2 +** (**Bridged** –) terminal and the other end to the left speaker's negative (–) terminal.
3. Connect one end of a second speaker wire's marked conductor to the amplifier's **+ CH3** (**+ Bridged)** terminal and the other end to the right speaker's negative (–) terminal.
4. Connect the unmarked conductor's end (in the same speaker wire) to the amplifier's **CH4 +** (**Bridged** –) terminal and the other end to the right speaker's positive (**+**) terminal.
5. Push in the right **BRG/ST** (Bridged/Stereo) switch to the **BRG** position to bridge the front speakers **(CH1** and **CH2)**.
6. Push in the left **BRG/ST** (Bridged/Stereo) switch to the **BRG** position to bridge the rear speakers **(CH3** and **CH4)**.

Connecting Two Unbridged Speakers and One Unbridged Subwoofer

1. Connect the two speakers to the **CH1** and **CH2** terminals (front speakers) or to the **CH3** and **CH4** terminals (rear speakers).
2. For an unbridged connection, connect the subwoofer to the amplifier's **CH3** or **CH4** terminals (if you used the front speaker connections in Step 1) or the **CH1** or **CH2** terminals (if you used the rear speaker connections in Step 1**).**
3. Push in **X-OVER FREQ** so you can later adjust the amplifier's sound to compensate for your vehicle's acoustics (see "Using the Frequency Crossover").
4. Press and release the left and right **BRG/ST** (Bridged/Stereo) switches to make sure they are off.

Connecting Two Unbridged Speakers and One Bridged Subwoofer

1. Connect the two speakers to the **CH1** and **CH2** terminals (front speakers) or to the **CH3** and **CH4** terminals (rear speakers).
2. For a bridged connection, connect the subwoofer to the amplifier's **+ CH3** and **CH4 +** terminals (if you used the front speaker connections in Step 1) or the **+ CH1** and **CH2 +** terminals (if you used the rear speaker connections in Step 1).
3. Push in **X-OVER FREQ** so you can later adjust the amplifier's sound to compensate for your vehicle's acoustics (see "Using the Frequency Crossover").
4. Press and release the right **BRG/ST** (Bridged/Stereo) switch to make sure it is off.
5. Push in the left **BRG/ST** (Bridged/Stereo) switch to the **BRG** position to bridge the rear speakers (**CH3** and **CH4**).

TESTING THE CONNECTIONS

Before you permanently mount the amplifier, connect your vehicle battery's negative (-) cable, turn your vehicle's ignition to ON or ACC, then test the connections.

The amplifier is properly connected to the autosound system and speakers if you can verify that the amplifier and the autosound system turn on properly and the speakers' sound is clear and unmuffled.

If you cannot quickly verify that all components operate properly, ***immediately turn off your vehicle's ignition***. Then disconnect your vehicle battery's negative (-) cable and recheck your connections.

Once you verify that all components operate properly, mark the connections to insure easy identification of each wire, then follow the instructions under "Mounting the Amplifier."

MOUNTING THE AMPLIFIER

Before you begin mounting the amplifier, make sure you have the following supplied hardware necessary for mounting.

- 6 sheet-metal screws
- 6 spring washers
- 6 flat washers

Then confirm that the amplifier fits your vehicle's mounting area.

Caution: Be careful to not drill into anything behind the mounting surface

1. Temporarily disconnect your vehicle battery's negative (-) cable again.
2. To make mounting more convenient, temporarily disconnect the amplifier's connections (ground, primary power, remote power, your vehicle stereo's input, and speakers).

3. Using the mounting holes on the amplifier as a guide, mark the locations for the mounting holes.

4. Drill $^{9}/_{64}$-inch holes in the marked locations, being careful not to damage anything behind the mounting surface.
5. Attach the amplifier to the mounting surface using the supplied sheet-metal screws and washers.

6. Reconnect the wiring.
7. Reconnect your vehicle battery's negative (-) cable.

OPERATION

TURNING ON THE AMPLIFIER

The amplifier automatically turns on whenever you turn your vehicle's ignition switch to ACC or ON. POWER lights when the amplifier is operating.

SETTING THE LEVEL CONTROL

For the best performance, you can adjust the level of audio signals that enter the amplifier by following these steps.

Cautions:

- When the amplifier's internal temperature reaches 202×F, the automatic thermal protection system lowers the amplifier's output power until it cools down.
- The sound distorts if any output channel shorts. Turn off the amplifier and try to locate the short.
- To prevent draining the vehicle's battery, do not operate the amplifier using the ignition switch's ACC position for too long after turning off the vehicle's ignition.

1. Turn both **LEVEL MIN/MAX** controls fully counterclockwise to **MIN**.

Note: The right level control adjusts the inputs to **CH1** and **CH2** (normally the front) and the left level control adjusts the inputs to **CH3** and **CH4** (normally the rear).

2. Temporarily turn up the autosound system's volume control to about one-third of its full range.

   Caution: Never turn the level controls up any farther than you need to get clear sound at two thirds volume maximum.

3. Turn the left and right **LEVEL** controls clockwise until you can hear the sound at a comfortable level.

4. Turn up the volume on your autosound system until the sound begins to distort. Then immediately turn down the volume to the point just below where distortion began.

5. Adjust the level controls until the volume is at the maximum level you want the autosound system to produce.

6. Adjust the autosound system's volume control to a comfortable listening level.

USING THE FREQUENCY CROSSOVER

X-OVER FREQ On/Off Switch

To use the amplifier's crossover function with a subwoofer, push in **X-OVER FREQ** to **On**. To use the amplifier without a subwoofer, push and release **X-OVER FREQ** to **Off.**

X-OVER FREQ Control

When you push in **X-OVER FREQ** to **On,** the **X-OVER FREQ 45 Hz/400 Hz** lets you adjust the crossover frequency from 45 Hz to 400 Hz for Channels 3 and 4 so you can adjust the sound to compensate for your vehicle's acoustics.

Note: Since this only controls the 45–400 Hz frequencies, this control is useful only for subwoofers and not your main speakers.

MAINTENANCE

Your Optimus 85 × 4 High Power 4-Channel Trunk Mount Amplifier is an example of superior design and craftsmanship. The following suggestions will help you care for your (product name) so you can enjoy it for years.

Keep the amplifier dry. If it gets wet, wipe it dry immediately. Liquids might contain minerals that can corrode the electronic circuits.

Handle the amplifier gently and carefully. Dropping it can damage circuit boards and cases and can cause the amplifier to work improperly.

Use and store the amplifier only in normal temperature environments. Temperature extremes can shorten the life of electronic devices and distort or melt plastic parts.

Keep the amplifier away from dust and dirt, which can cause premature wear of parts.

Wipe the amplifier with a damp cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the amplifier.

Modifying or tampering with the amplifier's internal components can cause a malfunction and might invalidate your amplifier's warranty. If your amplifier is not performing as it should, take it to your local Radio Shack store for assistance.

REPLACING THE FUSES

If the amplifier shuts down, you might need to replace the power wire's 50-amp tube-type fuse, either of the two 25-amp blade-type fuses on the back panel, or all three fuses.

Cautions:

- Do not use a fuse with ratings other than those specified here. Doing so might damage your amplifier.
- After replacing a fuse, let the amplifier cool down before you turn it on again.

Turn off your autosound system, then disconnect the cable from your vehicle battery's negative (-) terminal.

Replacing the Tube-Type Fuse

1. Grasp the two ends of the power wire's fuse holder and twist one of them counterclockwise, then pull the ends apart.
2. Insert a new 50-amp, tube-type fuse into the longer of the fuse-holder's ends, then grasp the fuse-holder's two ends, push them in and twist them clockwise.

(Illus for Step 1

Replacing a Blade-Type Fuse

1. Grasp the fuse's plastic end and pull it out.
2. Grasp the new fuse's plastic end and simply push it in.

(Illus for Step 1

SPECIFICATIONS

10% THD Output Power @ 14.4 VDC 1 kHz
- (4 Channel Mode) ..... 85 W ¥ 4
- (Bridged Mode) ..... 170 Watts ¥ 2

Frequency Response ..... 20–20,000 Hz (±3 dB)

Input Impedance
- Low Input ..... 10 kOhms
- High Input ..... 100 Ohms

Input Sensitivity (for 10% THD Output Power)
- Low Input ..... 250 mV

Maximum Current Draw ..... 50 A

Dimensions..... $2^{5}/_{8}$ ¥ $10^{13}/_{16}$ ¥ $16^{3}/_{16}$ Inches (HWD)
(6.7 ¥ 27.5 ¥ 41.1 cm)

Net Weight..... 17.2 lbs (7.8 kg)

Specifications are typical; individual units might vary. Specifications are subject to change and improvement without notice.

RADIO SHACK LIMITED WARRANTY

This product is warranted against defects for 1 year from date of purchase from Radio Shack company-owned stores and authorized Radio Shack franchisees and dealers. Within this period, we will repair it without charge for parts and labor. Simply **bring your Radio Shack sales slip** as proof of purchase date to any Radio Shack store. Warranty does not cover transportation costs. Nor does it cover a product subjected to misuse, accidental damage, alteration or improper installation.

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This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

We Service What We Sell *9/94*

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