ADS P100

INTRODUCTION

Congratulations! You have chosen one of the finest, most sophisticated automotive power amplifiers on the market today. The P100 ("Power Plate") represents yet another breakthrough in automotive audio products from ADS, the company that pioneered the concept of mobile high-fidelity. It features innovations, such as a high-efficiency digital switching power supply and an effective yet inobtrusive overload protection circuit, not found in even the most highly touted home and professional application power amplifiers. And unlike most other automotive amplifiers, the Power Plate delivers its full rated power and distortion **in actual use** rather than only under laboratory conditions. This means you get total performance without any annoying side-effects, even when driving low-impedance, high-reactance loudspeakers. As with all ADS products, the Power Plate 100 is designed to provide clean, effortlessly musical sound in a wide variety of applications.

Although every reasonable step has been taken to simplify installation and everyday use, proper set-up of the Power Plate 100 requires attention and care. It is certainly more difficult to set up than a home amplifier. Whether or not you intend to install the Power Plate yourself, we strongly recommend that you read this manual in its entirety.

Finally, we suggest you save this manual and the packing carton for possible future use.

Thank you.

Analog & Digital Systems, Inc.

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OWNER'S RECORD

For your own protection, please record the unit's serial number, date of purchase and place of purchase in the spaces provided below. The serial number is located on the side of the unit.

Model Number: P100

Serial Number: _____

Date of Purchase: _____

Place of Purchase: _____

EXTERNAL FEATURES

The numbers assigned to the Power Plate's various external features in this section will be used throughout the manual to help you identify and locate them.

1. Fuse Holder

Provides instant access to the Power Plate's 15 Ampere "slo-blo" protection fuse. Replace **only** with a new fuse of the identical type and rating. Using the wrong fuse may result in severe damage to the Power Plate and/or your car's electrical system.

2. +12 Volt Terminal

This terminal should be connected directly to the car battery's positive (+) terminal using heavy gauge wire. To avoid power loss, there should be no extraneous devices, such as switches, connected to this terminal. See page 6.

3. Ground Terminal

The Power Plate should be grounded to your car's chassis via this terminal. Heavy gauge wire and solid electrical connections are essential for full-power, noise-free performance. See page 10.

4. Remote Control Terminal

Enables you to turn the Power Plate "on" and "off" from your dashboard. This terminal should be connected to a switchable +12 Volt source, such as the power antenna output found on many modern car radios. The presence of +12 Volts at this terminal turns on the Power Plate, and interrupting the +12 Volts turns it off. See page 7.

5. Left Speaker Output Terminals

6. High Level Inputs

These inputs have low sensitivity and are designed to be connected to the speaker outputs of most car radio/tape players. They should be used only if your radio/tape player does not have "line level" outputs. If your radio/tape player provides you with a choice of speaker or line outputs, or if it has no speaker outputs at all, you should use the Low Level Inputs (9) instead. See page 5.

7. Left and Right Channel Input Sensitivity Controls

Matches the Power Plate's inputs to the output level of your car radio/tape player. Using the small screwdriver supplied with the Power Plate, you can turn these controls to adjust the High Level Input sensitivity from 1 to 3 Volts and the Low Level Input sensitivity from 200 to 600 millivolts. See page 7.

8. Bass Equalizer Switches

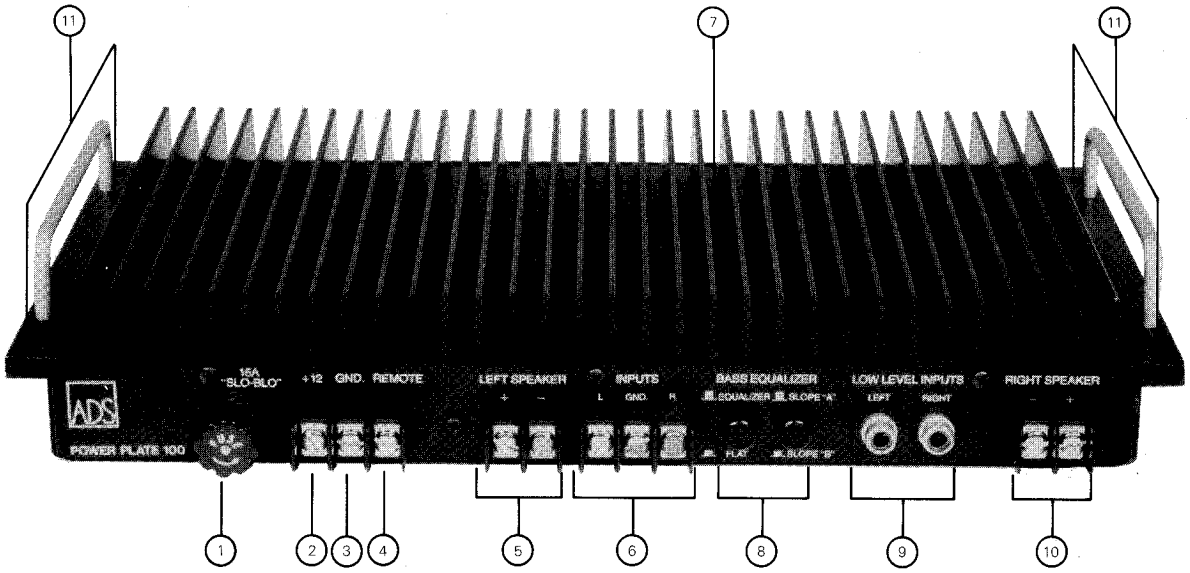
These two pushbutton switches work in combination to provide three different bass response contours. They enable you to optimize the low-frequency performance of your car stereo system. See page 8.

9. Low Level Inputs

These are high sensitivity inputs designed to accept the superior-quality "line level" outputs available on many modern car radio/tape players. Connections are made via standard RCA-type phono jacks. See page 5.

10. Right Speaker Output Terminals

11. Mounting Holes



ADS P100

PRECAUTIONS

1. The Power Plate 100 was designed to be used in 12 Volt **negative ground** systems. All modern automobiles have negative ground, but a few older cars have positive ground systems. If there are any questions about your car's grounding system, consult your service station or your car's shop manual before proceeding with installation. Attempting to install the Power Plate in a positive ground system may result in severe damage to the amplifier and/or the car's electrical system.

2. The Power Plate 100 is capable of delivering substantial amounts of power to the speakers. You must, therefore, make sure the system is "off" when making or altering connections, especially those at the amplifier's inputs. Costly damage to your speakers may otherwise result.

3. Unless you can provide the equivalent of a car battery (12-13.5 VDC at high current), do not attempt to use the Power Plate 100 in the home. The Power Plate is not designed to operate on household AC. Using an inappropriate power source can have very dangerous consequences.

ASSOCIATED EQUIPMENT

There is a large number of automotive audio products available today. Needless to say, your Power Plate 100 should be used with only the finest car stereo components. Although the Power Plate will perform well with many different types of signal sources and speakers, the final results will very much depend on your choice of components.

The Power Plate accurately amplifies all noise and distortion as well as music. It is, therefore, important that you select a car radio/tape player of suitably high quality. A modern car tuner/cassette player with Dolby* noise reduction and low-noise/low-distortion electronics is highly recommended. Your ADS dealer can help you select a unit with advanced features and capabilities.

Choice of speakers is equally important. They must handle high power levels and provide uncolored, musical sound if they are to do justice to the Power Plate's superb performance. Unfortunately, this means that most inexpensive car speakers on the market are unsuitable for use with the Power Plate. Your ADS dealer, once again, can be most helpful in recommending car speakers which not only complement the Power Plate, but also suit your tastes and needs. ADS' miniature acoustic suspension and flush-mounting speakers are highly recommended because of their unrivalled sonic excellence and high sound pressure level capability.

Note: The number of speakers you can drive with one Power Plate depends on the electrical characteristics of the selected speakers, the installation of the Power Plate, and, to some degree, your listening tastes. A properly installed Power Plate is capable of driving combined impedances as low as 2 ohms (e.g. two pairs of ADS 300i speakers), but beware. Some speakers are rated at 4 ohms but have significantly lower impedances at certain frequencies. Two pairs of such a speaker would make unreasonable current demands on any type of amplifier. Such a combination can cause the Power Plate to overheat and force its protective circuits to shut down the system. If you wish to use four speakers and like your music loud (or have a lot of engine noise to overcome), one Power Plate, therefore, may not be enough. In such instances we strongly urge you to consider a separate Power Plate for the second pair of speakers.

INSTALLATION

Who Should Do the Installation?

Installing an automotive high-fidelity system is no trivial matter. The quality of installation can affect the system's performance and reliability, not to mention appearance. Although there is a great deal of personal satisfaction and pride to be gained in doing your own installation, you should seriously consider the advantages of a professional installation.

There are many professionals who specialize in automotive stereo installations. You should have no trouble locating one near you. (The dealer from whom you purchased your Power Plate may provide installation services.) Most installers have the necessary tools and experience to do a neat and sonically satisfying job. They have already done the experimenting and know how to avoid unnecessary drilling and cutting. Above all, a professional installation can reduce the risk of damage, to either your car or the Power Plate, or of self-injury caused by unforeseen difficulties. The professional who installs your car stereo system, furthermore, is someone to whom you can always turn should you have trouble later on.

If, however, you have the necessary time, tools, abilities and confidence to do your own installation, you should find this manual to be a valuable guide. We suggest you begin by carefully planning your installation.

Choosing the Best Mounting Location

The slim and compact design of the Power Plate 100 permits it to be mounted in a variety of locations with absolutely minimal sacrifice of passenger or cargo space. Under the front or rear seats, under the package shelf, and inside the trunk are several

*The word "Dolby" is a trademark of Dolby Laboratories, Inc.

possible locations for the Power Plate. You may be able to think of some others for your particular automobile. Whatever location you choose, make sure the installation provides for the following:

1. Adequate ventilation

Although the heatsink fins on the Power Plate stay at safe temperatures in normal use, prolonged playing at high levels or unusual load conditions (such as multiple low impedance speakers) will generate excessive heat. This should cause no difficulty as long as the Power Plate is properly ventilated. There should be a minimum of 2" clearance above the unit, and the front and rear of the amplifier should be clear of any objects which would prevent free flow of air through the heatsinks. The passenger compartment is a better mounting location than the trunk because restricted air circulation in the trunk results in substantially higher ambient temperatures. Lack of adequate ventilation will lead to frequent triggering of the Power Plate's thermal shutdown system.

WARNING: Do not install the Power Plate with the heatsink fins pointing down as that will surely cause overheating. In order for proper heat exchange to take place, the amplifier must be mounted right-side up. Upright mounting is permissible as long as the heatsink fins are oriented vertically.

2. Access to controls and terminals

Once you have made all the necessary connections and control settings on the Power Plate, it is unlikely that you will want to alter them in day-to-day use. It is, nevertheless, desirable to have ready access to the Power Plate's connection/control panel. You will appreciate this point if you ever have to replace the Power Plate's fuse (1) or decide to change the Bass Equalizer (8) settings.

3. Proximity to battery and rest of system

Avoid installing the Power Plate in a location which makes it necessary to run long lengths of wire. It is highly desirable to keep the 12 Volt supply wire from the battery, the wires to the speakers, and the signal cables from the radio/tape player as short as possible. Excessively long wire lengths can rob the system of power and increase the chance of picking up extraneous noise.

4. Protection from excessive moisture

Make sure your installation site protects the Power Plate from heavy moisture. Many trunks, for example, have poor seals, permitting water to seep in during heavy rain or washing. Water damage to the Power Plate can be very costly because of potential additional harm to the car's electrical system and the other components of your car stereo.

5. Physical strength

Even though the Power Plate is compact and relatively lightweight, it is important that it be rigidly affixed to your car. If it is loosely installed and permitted to bounce around, it can be damaged by shock or cause damage to immediately surrounding objects. The resulting stress on the wiring, furthermore, may cause open or short circuits. Worse yet, loose in the passenger compartment, the Power Plate can become a dangerous projectile causing bodily injury during sudden stops or in the event of an accident.

You will probably find that the best way to satisfy these five requirements is to mount the Power Plate under one of the seats. If this is not practical, however, you should make sure that your mounting location satisfies the above conditions as well as possible.

Required Tools and Hardware

You will need to assemble a set of commonly available tools in order to perform the installation. You should have an electric drill with an assortment of bits, several sizes and types of screwdrivers, pliers, cutters, wire-strippers, tape (electrical and friction), a sharp hobby knife or razor blade, soldering iron and solder. If you use solderless crimp-on terminals, make sure you have an appropriate crimping tool.

Hardware to accommodate the most commonly encountered mounting locations and methods have been included with your Power Plate 100. You will have to supply your own hardware for any unusual installation methods. Your local hardware supply store should be able to assist you in obtaining specialized mounting hardware. Solder lugs or solderless terminals, although not essential, can help you achieve a neat, professional appearance in your wiring. These can be purchased at most electrical parts stores.

Finally, you must supply your own wires and cables for all connections to and from the Power Plate. See the section of this manual entitled "Connections" (page 5) for recommended types and sizes. Your ADS dealer can assist you in obtaining necessary wiring.

Physical Installation

Before drilling any holes, position the Power Plate at your intended mounting location to make sure ventilation and access requirements have been met. You should also study the layout of your car and know exactly into what you will be drilling. Extra care ahould be taken if you intend to install your Power Plate near the gasoline tank, wheel well or any wiring harnesses.

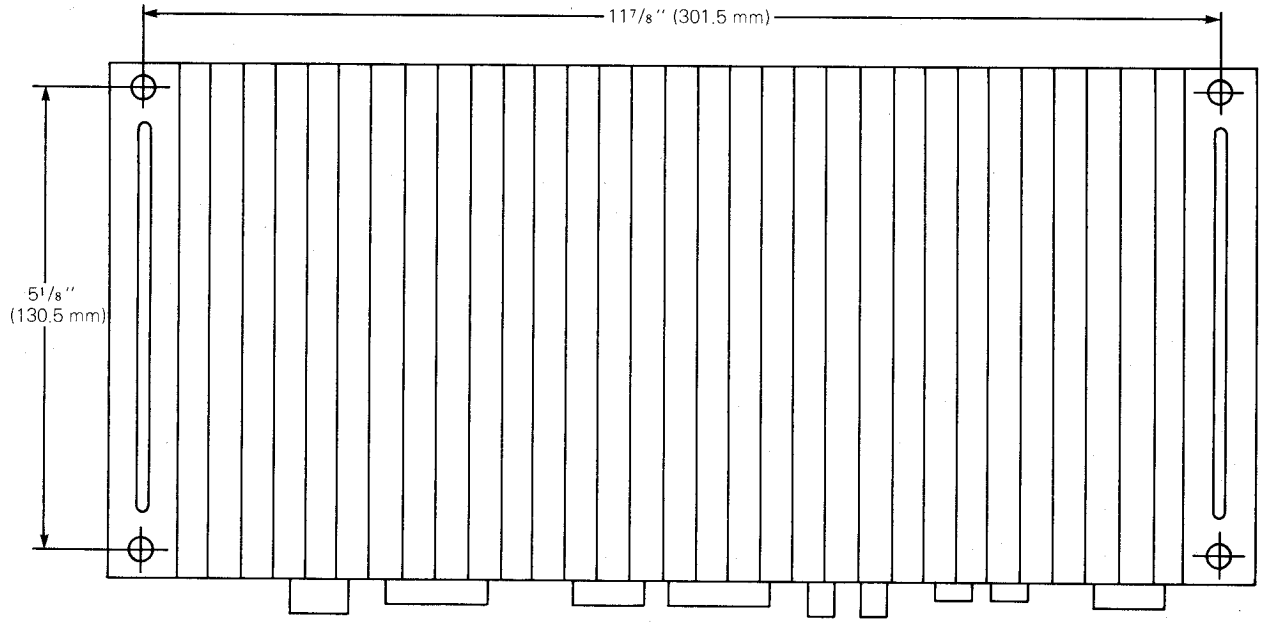


Figure 1. Mounting Centers

Use the top plate diagram (Figure 1) as a guide for drilling. After noting the spacing requirements for the mounting holes (11), mark the mounting surface for drilling. If you are drilling into carpeting or padding of any kind, you should cut away small patches of material with a sharp knife to expose bare metal before drilling. For precise location of the holes, use a centerpunch to help you position the drill bit. Always start with a drill bit several sizes smaller than necessary, and work your way up to larger sizes as needed. This will reduce the risk of accidentally stripping the holes with the self-tapping screws.

Once the drilling has been completed, lower the Power Plate into position and line up the mounting holes (11) with the holes you have drilled. Insert one of the self-tapping screws into a mounting hole on the Power Plate while positioning a stand-off spacer between the amplifier and mounting surface (see Figure 2). Make sure the screw "catches" on the drilled hole, and tighten lightly. Repeat for the three other mounting holes. Once all four screws have been positioned, tighten them completely with an appropriate screwdriver. **Do not overtighten** — you will ruin the screw and/or render the hole useless.

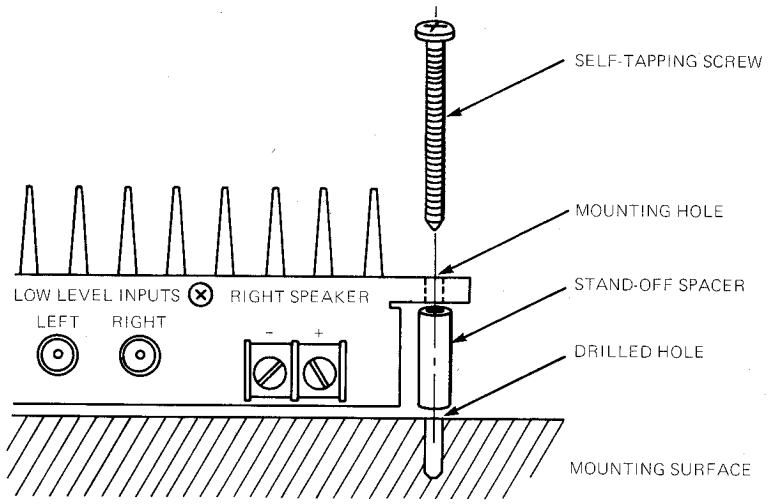


Figure 2. Mounting Procedure

CONNECTIONS

If you have mounted the Power Plate as recommended, you should have ready access to all of the jacks and terminals. With all of your other components in place, connecting your system is a simple matter of choosing the proper wiring, routing the wiring and making the correct terminations.

Input Connections

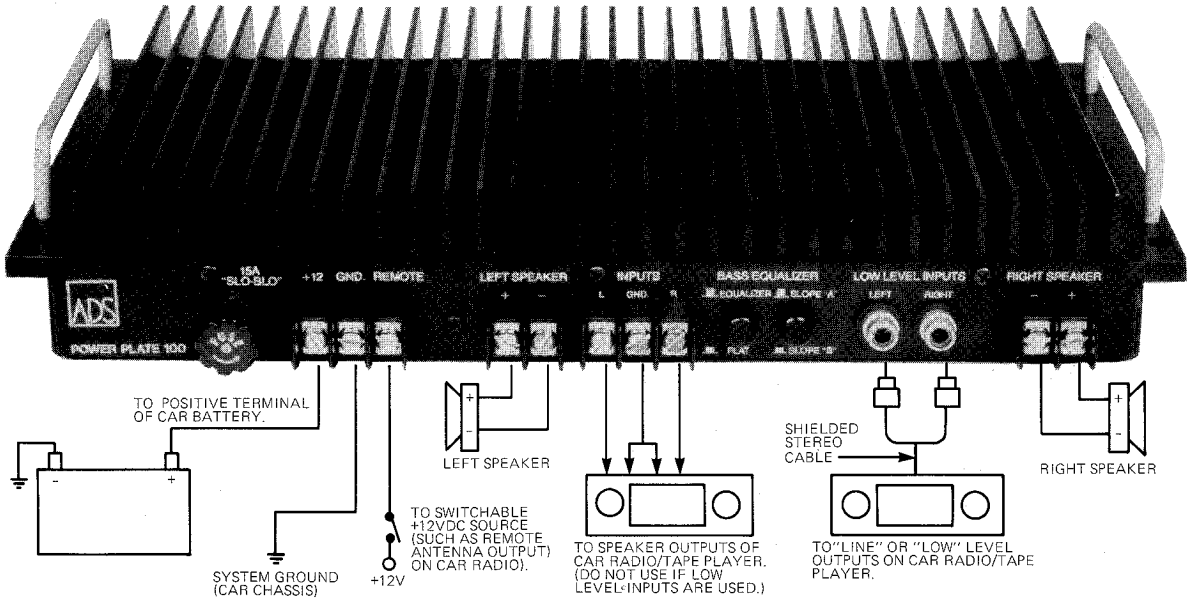
The Power Plate 100 provides two sets of inputs in order to accommodate a wide variety of signal sources. If you have one of the more recent car radio/tape players with a choice of speaker or line level outputs, use the latter with the Power Plate's Low Level Inputs (9). If your car radio has only speaker outputs, you can still enjoy excellent sound by using the Power Plate's High Level Inputs (6). You may also own one of the new automotive FM tuner-preamplifier/cassette decks which provide only line level outputs. In this case, of course, you should use the Power Plate's Low Level Inputs (9).

Important: You must use **either** the Low Level **or** High Level Inputs. **Never use both** sets of inputs in an installation.

When using the Power Plate's Low Level Inputs (9), connect the car radio/tape player to the amplifier using standard stereo shielded cables which terminate in RCA-type phono plugs. These are available at most audio and electronics supply stores in a wide variety of lengths. Pick the size which most closely matches your particular installation to avoid excessive lengths. Alternately, you may choose to fashion your own signal cables using low-loss coaxial cable and solder-on RCA plugs. This latter alternative, needless to say, requires soldering skills, but it can result in neat, "customized" wiring. In any event, make sure you observe "left" and "right" channel indications at the car radio/tape player and the Power Plate.

If you have to use the Power Plate's High Level Inputs (6), make sure you know which terminals on your car radio's speaker outputs are "ground". The speaker terminals which are grounded are generally marked "gnd.", "neg." or "–". If you are unsure, you should test the speaker terminals with an ohmmeter to determine polarity. To connect the speaker output of the car radio to the Power Plate's High Level Inputs (6), use shielded cable or normal speaker wire (lamp cord). The former is preferable. If speaker wire is to be used, it should be 20 gauge or heavier (smaller number) and clearly marked for polarity. (There is usually a "rib" on the insulation, differently colored conductors, or a thread running through one conductor to enable you to differentiate the two conductors.) Connect the the ground terminal(s) on the car radio's speaker outputs to the "GND" terminal on the Power Plate's High Level Inputs (6). Connect the left and right "hot" terminals on the car radio's speaker outputs to the corresponding terminals on the Power Plate's High Level Inputs (6). If you are using shielded cable, use the shield to make ground connections.

Note: Certain car radios have "bridged" or "balanced" speaker



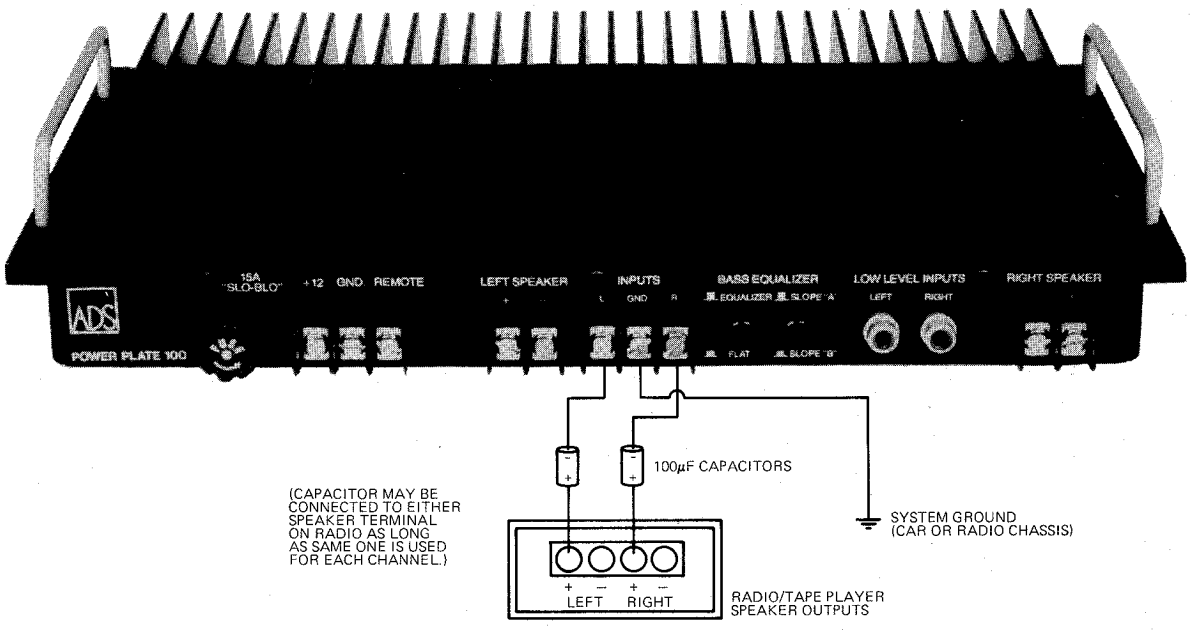


Figure 4. Input Connections for Radios with Bridged Outputs

outputs.* In bridged configurations, none of the speaker terminals are at true ground potential. If you have determined that your car radio has bridged outputs, you must obtain two 100μF capacitors and insert one in series with each input to the Power Plate. In this case, use only one of the car radio's speaker terminals for each channel (making sure you use the same terminal for both channels), and connect the ground terminal of the Power Plate's High Level Inputs (6) to system ground (radio or car chassis) at the point which results in least noise. The capacitors should be soldered to the connecting cables and carefully insulated with electrical tape to prevent shorting. Figure 4 illustrates the proper connection scheme for car radios with bridged outputs. Note that the positive lead of the capacitor is wired to the radio.

Speaker Connections

Make all speaker connections using 18 gauge or heavier (smaller number) wire. It is essential to observe phasing when connecting speakers to an amplifier, and car installations are no exceptions. This means that the left and right channels must be connected in identical polarity. You can connect the "+" terminal of the Power Plate's Left Channel Speaker Output (5) to the **negative** terminal on the left speaker(s) as long as you do the same with the right channel. Most speaker wire (and lamp cord) have markings, such as a "rib" on the insulation, differently colored conductors or a thread running through one conductor, to enable you to differentiate the two conductors without tracing down the length of the wire.

Power Connections

Since the Power Plate 100 can draw very high levels of current on musical peaks, you cannot power it from an accessory or other existing circuit on your car's fuse block. The +12V Terminal (2) on the Power Plate should be connected directly to the "+" terminal on your car's battery using 14 gauge or heavier (smaller number) wire. (Solder lugs or crimp-on terminals are particularly useful for connections to the battery terminal.) Any resistance in this path, such as the resistance inherent in switching devices, thin wires and poor connections, can cause loss of power. Do not, therefore use a switch in the power line. (See **"Remote Powering Connections"** page 7.) We recommend you fuse this direct power line, using a heavy duty fuse holder, and solder it into the line **near the battery.** Use a

***Car radios with bridged outputs typically are rated between 10 and 20 watts per channel.**

20 Ampere slo-blo fuse. Insulate all connections carefully to prevent shorting.

The Power Plate's Ground Terminal (3) should be connected to the car's chassis at the point which results in the least noise. Sometimes, it is best to use the same ground point you use for your car radio/tape player. Use 14 gauge or heavier (smaller number) wire, and make sure that all connections are clean and tight.

WARNING: Connect the power leads to the Power Plate **before** attaching the "+" lead to the battery. If you attach the wire to the battery while the other end is free, you may short-circuit your battery. Should the power lead be unfused, such a short can produce catastrophic results.

Remote Powering Connections

Using a low current +12 Volt DC signal, the Power Plate can be turned on and off from a remote location. This eliminates the need to switch the direct power line between the battery and the amplifier. The Remote Control Terminal (4) on the Power Plate should be connected to a switchable +12 VDC source using a single wire, 20 gauge or heavier (smaller number). Since the remote powering feature requires only 15mA of current, the power antenna output found on many modern car radios is an ideal source. You may also elect to install an independent switch on your dashboard which routes +12 VDC from an accessory circuit to the Power Plate's Remote Control Terminal (4). The Power Plate is completely "off" and draws no current from the battery unless +12 VDC is present at the Remote terminal.

Wiring Tips

1. Never route wiring underneath the car. Wiring can be neatly and safely hidden inside the car by running it underneath carpeting, behind panels, etc.

2. If you are not using lugs or crimp-on terminals at the ends of your wires, you should "tin" the free ends with solder to minimize fraying. Loose strands of wire may otherwise cause short circuits.

3. Make sure the wiring does not rub against sharp edges or get caught in door jambs. If wiring is routed through any holes drilled in metal, make sure there are no burrs which may cut into the wire. (Use rubber grommets wherever possible.) Using friction tape, dress and reinforce any section of wire which is exposed to heat or subject to wear.

FINAL ADJUSTMENTS

Now that you have performed the physical installation and electrical connections, you are ready to test the system. Start your car's engine, and then turn on your car radio/tape player, but leave the volume control at minimum. Next, turn on the Power Plate using whatever switching facility you have connected. Slowly turn up the volume control on your radio/tape player. Tune in a station or play a tape, and make sure you hear sound from both channels. If all is well, proceed with the final adjustments described below. If you experience difficulty, consult the next section on troubleshooting.

Input Sensitivity Adjustment

Two trim potentiometers, accessible through holes on the heatsink

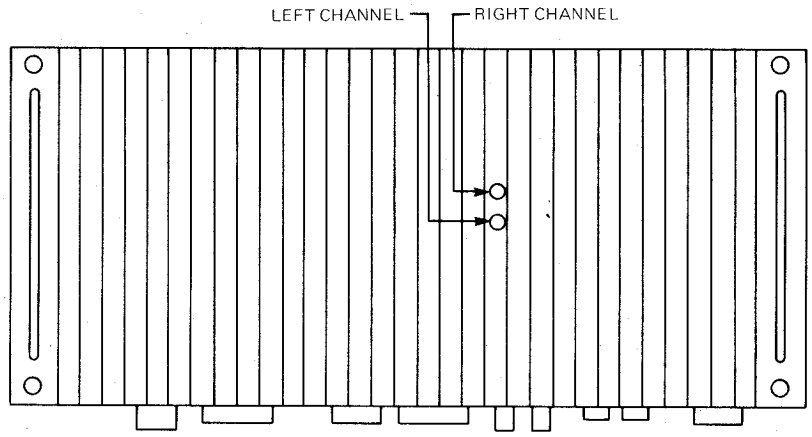


Figure 5. Input Sensitivity Controls

IMPORTANT NOTICE

To protect your speakers from turn-on transients, the Power Plate has been designed to mute all output for a few seconds after it is switched on. You will hear no sound during this period. Wait until the muting circuit has released before turning up the volume.

surface, make it possible for the Power Plate to accommodate a wide range of input voltages. The left and right channel Input Sensitivity Controls (7) vary the Power Plate's High Level Inputs (6) from 1 V to 3 V sensitivity and the Low Level Inputs (9) from 200 mV to 600 mV sensitivity. (Input sensitivity is defined as the voltage required to drive the amplifier to full rated power into the rated load.) In order to adjust input sensitivity, you must experiment with the volume control on your car radio/tape player. With the volume control at a median setting, adjust the Input Sensitivity Controls (7) on the Power Plate using the small screwdriver supplied. Adjust for comfortable listening level and satisfactory balance between the channels. The volume control on your radio should now give you a range of levels from very soft to very loud. If not, re-adjust the sensitivity controls accordingly.

Note: Some car radio/tape player units produce different volume levels for radio and tape. Check the system with a number of different radio stations and pre-recorded tapes to make sure you can attain satisfactory volume levels. You may have to adjust the Power Plate's Input Sensitivity Controls (7) for a compromise which suits both program sources.

Bass Equalizer Settings

Low frequencies are more difficult to generate in automobiles than in the home. There are, furthermore, a number of different loudspeaker configurations, each with unique bass characteristics in automotive environments. For these reasons, the Power Plate has been designed with a built-in 3-position bass equalizer to help you achieve the most natural-sounding tonal balance possible with your particular system.

1. "FLAT" Position When the left-hand pushbutton switch of the Bass Equalizer (8) is in its "flat" position (pushed in), the right-hand switch has no effect. In this mode, the Power Plate has essentially uniform amplitude response except for subsonic filtering, which attenuates frequencies below 40 Hz. The subsonic filter is highly effective in controlling dangerously long excursions of the woofer. In automotive environments, the effect of the filter is totally inaudible. The "flat" setting is ideal for infinite baffle (open back) speakers, such as the ADS 300i system.

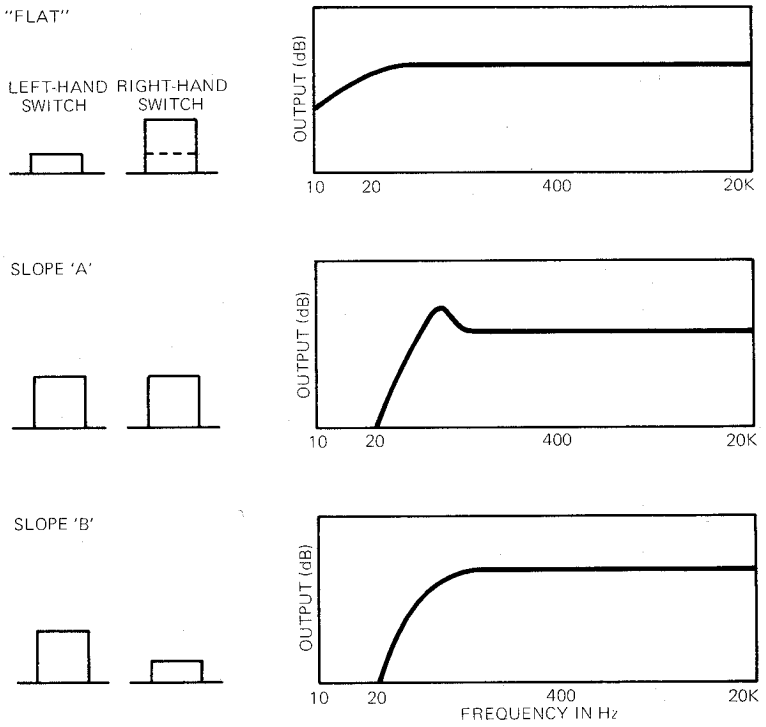


Figure 6. Bass Equalizer Characteristics

2. SLOPE 'A' This is the response which results when both Bass Equalizer Switches (8) are "out". See Figure 6 for a graphic representation of this setting. Slope 'A' is best suited for larger mini-speakers, such as the ADS 300C system. The slight rise at the lowest frequencies creates the subjective impression of deeper bass response while the sharp cutoff protects the woofers from "bottoming" on subsonic transients.

3. SLOPE 'B' To set the Power Plate for this response, the left-hand Bass Equalizer Switch (8) must be "out" while the right-hand switch is "in". Figure 6 illustrates the effect of Slope 'B'. This setting elicits the best overall performance from smaller mini-speakers, such as the ADS 200C system. A sharp subsonic filter protects the woofers from damage on low-bass information and ensures maximum linearity and clarity over the speaker system's usable range.

You may wish to experiment with the Power Plate's three bass equalizer settings and decide for yourself which one best suits your system and listening tastes. Remember, however, that the Power Plate is capable of delivering substantial amounts of bass energy. Loud playing with the "wrong" equalizer setting may be hazardous to your speakers.

TROUBLESHOOTING

During the initial period of use, or at some point in the future, you may encounter difficulties with your system. You may hear noise, unsatisfactory sound or no sound at all. The following is a brief guide to the most familiar problems, their probable causes and recommended remedies.

Your ADS Power Plate 100 has been designed for long service life. Should you encounter problems beyond the scope of this troubleshooting guide, please consult your ADS dealer or your car stereo installer. As there are no user-serviceable parts inside the Power Plate, please do not attempt your own repairs. Any repairs to the Power Plate must be made by ADS or an authorized ADS service facility.

No Power

Check all connections to the Power Plate's +12 Volt, Ground and Remote Control Terminals (2) (3) (4). If all connections are clean and tight, and there are no signs of short-circuiting, check the power line connection at the "+" terminal of your car's battery. Next check the fuse inside the Power Plate's Fuse Holder (1). If it is blown, replace with a fuse of the identical type and rating. If the new fuse blows again, and you are sure of all your connections, have your Power Plate checked by qualified service personnel.

Power, but No Sound or Low Sound

If you have determined that your Power Plate is receiving +12 VDC but you are not getting any sound or hearing only faint sound from your speakers, first check all input and output signal connections to the amplifier. If you are using the Low Level Inputs (9), you may have faulty shielded cable between the radio and amplifier. After making sure all signal connections are intact and free of short-circuits, check to make sure your speakers are working properly. (If your speakers have fuses, check them to make sure they are not blown. You can test your car speakers with an ohmmeter or by connecting them to your home stereo system.) The problem may very likely lie with the car radio/tape player. Are the heads clean? Is the tuner section properly connected to your antenna? Once again, if none of these steps cure the problem, consult a qualified professional for further assistance.

Noise

Noise is perhaps the single most pervasive and annoying problem encountered in automotive high-fidelity systems. There are many potential sources of noise in cars, and some are extremely difficult to trace down and overcome. In many cases, it may be impossible to totally eliminate noise from the system. In such cases, one can only hope to minimize it to an acceptable degree.

Upon installation of the Power Plate, you may hear noise you never heard with your previous car stereo system. Although the Power Plate itself is the quietest, most distortion-free amplifier available for automotive use, it most probably provides more gain (amplification) and wider frequency range than your previous system. Any noise picked up by your car radio/tape player will be amplified and reproduced louder and more accurately than ever before. This is why it is important that you mate the Power Plate with the finest available associated equipment and ensure that all wiring is of professional caliber.

Listed below are the most common types of noise and recommended steps for dealing with them. If you did not install the Power Plate yourself, it is best to seek professional help in curing all but the simplest noise problems.

1. "Hiss" The Power Plate has exceptionally wide dynamic range and, therefore, it is highly unlikely that it is the source of "hiss" or other types of random noise. If the hiss occurs only when playing a tape, it is possible that your tape player has a magnetized head. If de-magnetizing does not help, it may simply be that your tape player was not designed to provide high signal-to-noise ratio. (You shouldn't rule out the **tape** as a possible source of hiss. Many pre-recorded tapes are inherently noisy.) The same may be true of the tuner section. To minimize hiss, we recommend you use a high-quality radio/cassette player with built-in Dolby* noise reduction and play cassettes which have been recorded with the Dolby* system.

2. Automobile-generated noises

There are two very common types of car-generated noise - ignition and alternator. Ignition noise is a sharp ticking heard through the speakers in time with the combustion at the engine's cylinders. The frequency of the ticks should increase with engine RPM. Alternator noise is usually a background whining or whirring, also heard through the speakers. Its pitch increases with engine RPM. If your car has a fuel injection system, it may generate a third type of noise. Various features and accessories on your car, such as electric fuel pumps, windshield wipers, turn signals, horn, lights, etc., may also introduce noise into the system when activated. Some of these noises can be eliminated. Others can be effectively reduced. There are rare instances, however, where noise simply cannot be reduced without seriously degrading the performance of the automobile. A professional installer can help achieve an acceptable compromise in most cases.

When troubleshooting automobile-generated noises, it is best to try and eliminate them using wiring and grounding techniques before resorting to various noise suppression devices. Use the following guide to track down and alleviate car-generated noise problems:

*The word "Dolby" is a trademark of Dolby Laboratories, Inc.

(a) Wiring/grounding techniques: All grounds, including ground connections for the Power Plate, your car radio/tape player and your antenna must be tight and free of paint or corrosion. Do not use ground wires found in the wiring harness of your car; make your own secure ground points to the car's chassis. Generally, it is acceptable to ground each component to a nearby point on the chassis, but some situations may call for a single ground point. In some automobiles, insulating the Power Plate chassis from the car chassis may result in lower noise. You might also try jumping the Power Plate's input ground terminal to its power ground terminal. If you find a single ground point to work best, you should try different points on the chassis and listen for changes in the noise level. Generally, the negative terminal on the battery is a poor ground for the audio system. If shielded cable was used for input wiring, you may wish to try disconnecting the shield at the radio end, amplifier end or both ends. If you are getting noise from electric motors or other devices (turn signals, horn, etc.), check the ground point for the offending item as a poor connection is often the cause for the annoyance.

(b) Noise suppression devices: There are a number of car stereo noise suppression devices which can be purchased from audio dealers, installers and electronics supply stores. Some are appropriate for use with the Power Plate, but others are not. In particular, devices such as choke coils, which are inserted in series with the +12 VDC power line should be avoided unless absolutely necessary. If you must use a coil in the power line to the to the amplifier, make sure it has sufficiently high current rating (low DC resistance). The Power Plate draws 1 Ampere at idle but can draw up to 25 Amperes on program peaks. A smaller choke coil can be used at the car radio/tape player without adverse effect. If the alternator is the culprit, it is possible, in some cases, to obtain a series noise filter which can handle the entire current output from the alternator. A shunt capacitor to ground (100-1000 μF/50 VDC) at the alternator and/or the +12 VDC power line to the radio or amplifier can also be quite effective. Similarly with ignition noise, a capacitor to ground can be connected at the **positive** terminal of the ignition coil (the side that does **not** go to the distributor) to reduce the interference. If your automobile has a transistorized ignition system, the electronic distributor may be sealed and totally inaccessible. If so, you may be able to add spark plugs suppressors to reduce ignition noise. When using capacitors for noise suppression, make sure the negative terminal (case) of the capacitor is connected to the car's chassis.

(c) Other methods: If you hear loud noises through the speakers every time you use one of the car's electrical devices (wipers, horn, windows, turn signals,etc.), a capacitor (as above) connected to the power input of the device may substantially attenuate the noise. Worn brushes in motors often generate noise. If you have determined this to be the cause of noise, you can usually improve performance by replacing the brushes or motors in question.

PROTECTION SYSTEMS

In case you experience difficulty, you should be aware of the protection systems built into the Power Plate 100. A total of five systems ensure that your amplifier and speakers are protected from wiring errors, system failures and adverse operating conditions.

1. Fuse

The 15 Ampere slo-blo fuse in Power Plate's Fuse Holder (1) protects the amplifier and the car's electrical system from power surges and short circuits. It should always be replaced with a fuse of the identical type and rating. If the fuse blows repeatedly, consult a qualified service technician.

2. Reverse Polarity Protection

Should the Power Plate be accidentally wired in reverse polarity, an internal diode prevents damage to circuit components. Only the fuse will blow.

3. Amplifier Protection

The Power Plate 100 is fully protected from accidental short circuits and other unreasonable load conditions at the speaker terminals. A special limiting circuit ensures that the output stage is never driven beyond safe operating conditions. Thanks to high current design and careful application of limiting circuitry, however, this protection system never interferes with the music, even when driving low-impedance/high-reactance loads.

4. Speaker Protection

A sensing system monitors the output of the Power Plate for DC offset or very low frequency AC signals, which can be very harmful to the speakers. When the system senses either of these conditions, it will shut down the Power Plate's circuits. After 3 - 4 seconds, the system will recycle and turn the amplifier back on. If the condition still persists, the system will again shut down the amplifier. If the condition is caused by a failure in the Power Plate's circuitry, the system will turn the amplifier on and off repeatedly, thus producing a "motorboat" effect through the speakers. (Although annoying, the motorboating cannot harm your speakers.) Should you hear such an effect, turn off the system and have the Power Plate checked by your dealer.

5. Thermal Protection

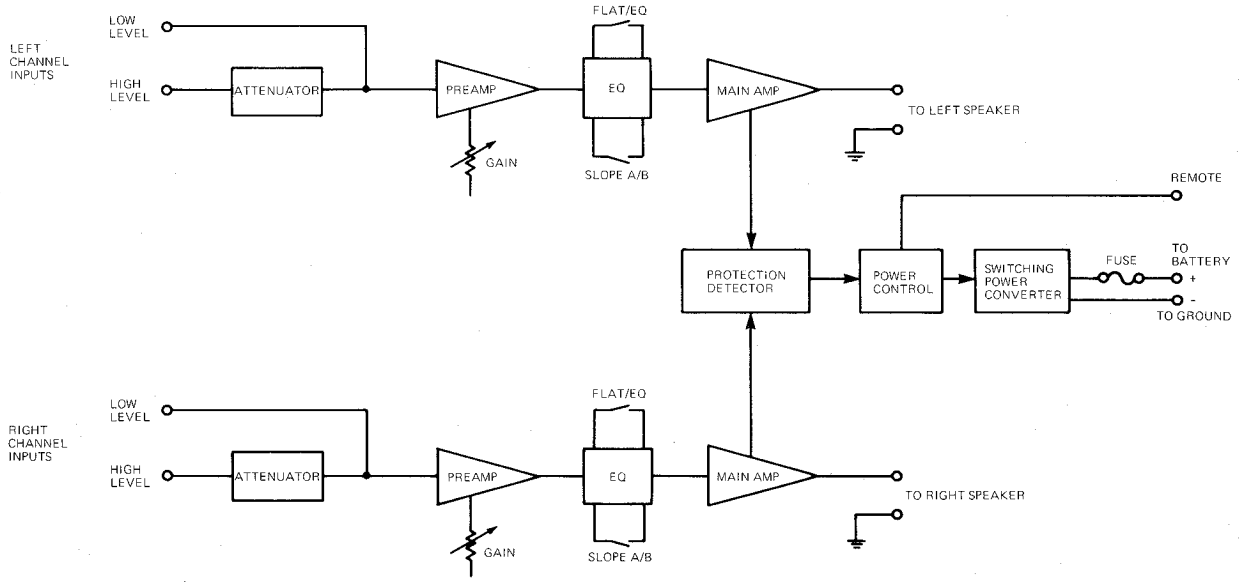
Should the heatsink on the Power Plate reach temperatures of 140° - 160°F (50° - 60°C), a thermal sensor will react and shut off power to the amplifier. If you find the thermal cutout operating rather frequently, you probably do not have adequate ventilation for the amplifier, and, therefore, you should re-locate the unit. High temperatures may also be the result of overloading the Power Plate. If you have more than one pair of speakers connected

to the amplifier, you must reduce listening level or reduce the number of speakers on each channel to alleviate the load. In rare cases, a malfunction within the Power Plate may cause the unit to overheat. If the amplifier shuts down despite optimum ventilation and loading, seek professional service for your Power Plate.

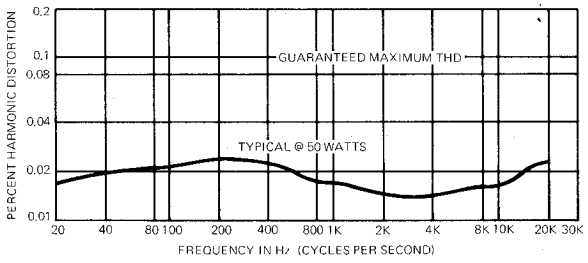
MAINTENANCE

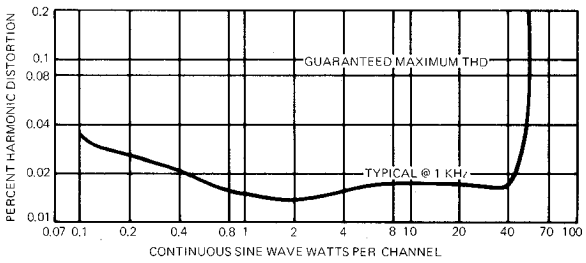
The ADS Power Plate 100 is essentially maintenance-free. Occasionally, check all of the connections and tighten any that may have loosened. You should also check your wiring to make sure no potential hazards have developed. If dust and dirt tend to accumulate on your Power Plate, clean off the heat-sink and connection areas once in a while with a dry, unused paint brush.

BLOCK DIAGRAM



TYPICAL PERFORMANCE





ADS P100

SPECIFICATIONS

Power Output	50 watts per channel minimum continuous sine wave ("RMS"), both channels driven into 4 ohms, 20-20,000 Hz with less than 0.08% total harmonic distortion
Dynamic Headroom:	1 dB
Output at Clipping, 1 kHz	65 watts
Total Harmonic Distortion:	guaranteed less than 0.08% at any frequency and power level; typically under 0.02%
SMPTE Intermodulation Distortion:	less than 0.08% at rated output; less than 0.05% at 1 watt output
Power Bandwidth:	10-28,000 Hz
Frequency Response:	30-20,000 Hz ± 0.5 dB
Signal/Noise Ratio:	90 dB or better, "A" weighted, ref. rated power
Input Impedance:	
Low Level	50K ohms
High Level	78 ohms
Input Sensitivity:	
Low Level	0.2 - 0.6 Vrms
High Level	1.0 - 3.0 Vrms
Damping Factor:	greater than 50 at 50 Hz and 1 kHz at 4 ohms
Power Requirement:	13.5 volts DC, negative ground (typical automobile electrical system)
Current Consumption:	
Minimum	2 amperes
Average (loud music)	7 amperes
Maximum (peak program)	30 amperes
Dimensions:	1-15/16"(H) × 12-¼"(W) × 6-¼"(D)
Approximate Weight:	5 lb. 4 oz.
Finish and Color:	satin black

WARRANTY

ADS POWER PLATE 100 LIMITED WARRANTY

Analog & Digital Systems, Inc. ("ADS") warrants to the first consumer purchaser of a new ADS Power Plate 100, that the Power Plate is free from defects in material and workmanship. ADS's sole obligation under this warranty shall be to provide, without charge, parts and labor necessary to remedy defects, if any, which appear within one year from the date of purchase.

This warranty is the sole and exclusive express warranty given with respect to the Power Plate and all other express warranties are hereby excluded. IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THE EXPRESS WARRANTIES. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. NEITHER ADS NOR THE LICENSED ADS DEALER WHO SELLS THE POWER PLATE IS RESPONSIBLE FOR INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

The ADS warranty does not extend to any defect, malfunction or failure caused by misuse, abuse, accident, faulty hookup, defective associated equipment, or the use of the Power Plate with equipment for which it was not intended. Please read your owner's manual carefully.

This warranty is valid only for an ADS Power Plate purchased in the U.S. and when the Power Plate is returned to the licensed ADS dealer from whom it was purchased or directly to ADS at the address shown below, freight prepaid, together with proof of date of purchase. For the names and addresses of other licensed ADS dealers in your area who will provide warranty service, simply contact ADS.

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

To facillitate prompt warranty service, please mail the warranty registration card within fifteen days.

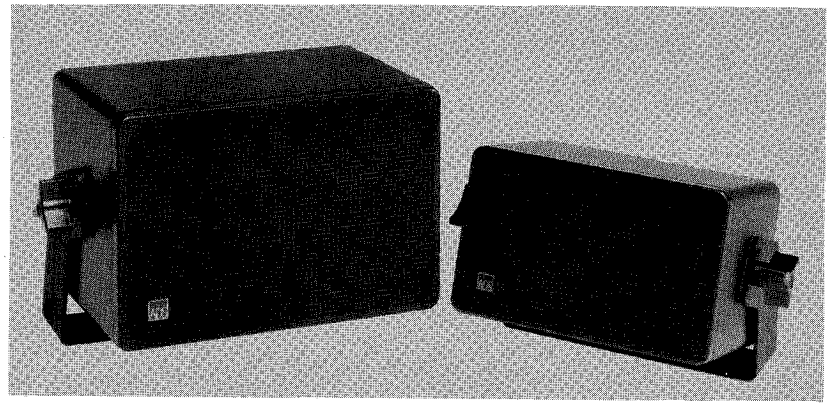
ADS, ANALOG & DIGITAL SYSTEMS, INC.
One Progress Way Wilmington, Massachusetts 01887 Phone (617) 658-5100

ADS Miniature Loudspeakers for Automotive Use

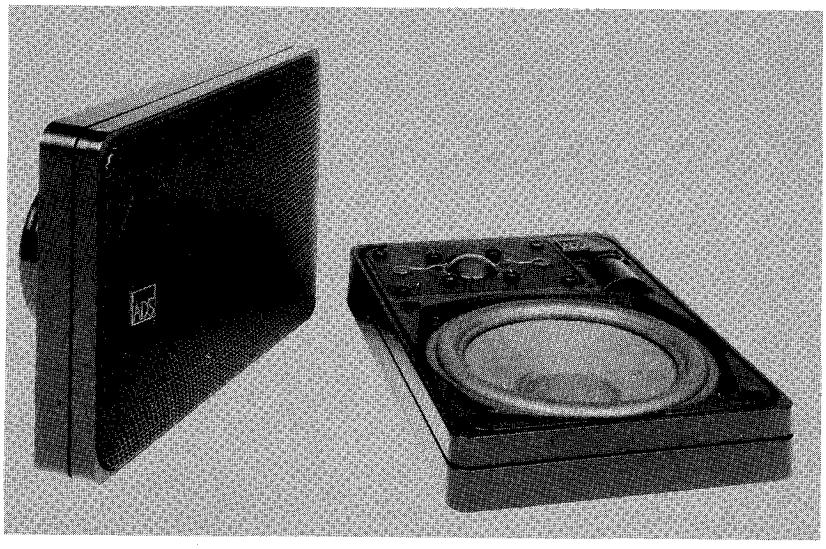
In 1975 ADS revolutionized mobile high-fidelity with the introduction of the famous Model 2001 miniature bi-amplified loudspeaker system. Since then, ADS mini-speakers have become extremely popular and perhaps the world's most frequently imitated loudspeakers.

Although there are many automotive loudspeakers available today, ADS mini-speakers continue to lead the way with uncanny musical accuracy, wide dynamic range, high power-handling capability, superb transient response, and smooth, extended frequency range.

We strongly recommend the following ADS mini-speakers for use with your Power Plate 100. The combination of the Power Plate and one of these ADS speakers represents the state-of-the-art in automotive high-fidelity.



200C and 300C
Miniature 2-Way Acoustic
Suspension Speaker Systems



300i
Flush-Mounting 2-Way
Automotive Speaker System

Write to ADS for information on these and other fine ADS loudspeaker systems. Or visit your ADS dealer and ask for a demonstration.