LINEAR POWER™
FOR THE LOVE OF MUSIC

MODEL 4.1HVS©

Series TO-3

(1997 MSRP $1599.00)

INSTALLATION AND OPERATION MANUAL

INTRODUCTION

Congratulations, with all the auto sound equipment available on the market today, decisions are not always easy. At **LINEAR POWER™,** we offer what no other company can: Since **1975** we have manufactured the best audio equipment for your car. Also, all **HV© Series** amplifiers have a **6-year** warranty is given to assure your investment in a **LINEAR POWER™** product was a wise choice. As expected, you will also see new ideas and products ranging from amplifiers to crossovers to preamps.

TECHNICAL DISCRIPTION

POWER SUPPLY: Our unique mosfet driven converter utilizing bipolar switching transistors offers greater reliability and efficiency. The regulation of the supply provides only the required amount of output current under all operating conditions. This new technology uses our proprietary **FMB© (fixed modulation block)** circuitry which marries mosfets with high power **TO-3** bipolar switching devices to bring you the best of both worlds. It gives the renowned reliability of the massive **TO-3** bipolar transistor and the increased efficiency of the mosfet transistor. The brains behind the power supply is the **FMB©** housed in the black box at the end of the amp, this controls two reference mosfet transistors which drive the bipolar **TO-3** switching devices along each side of the amp, providing large and fast amounts of power to run the amplifier.

Output Stages: Transformer less, direct coupled and fully complimentary. Output transistors are high current and low distortion **TO-3** devices, operating at a fraction of their limitations. In 8**-ohm mono**, the output devices in the **4.1HVS©** work 5**0%** of their design capabilities as engineered by Motorola. **Linear Power™** products are seriously over built!

PROTECTION: Since the **4.1HVS©** is capable of enormous amounts of output power, it is protected from short circuit and undersized load conditions. It is also protected against high ambient temperatures by thermal protection.

CONSTRUCTION: Features: Our unique, variable input sensitivity control permits optimal signal matching for lowest noise and lowest distortion with virtually any source. We use only high quality low **ESR** (Effective Series Resistance) filter capacitors for lower power supply loses. All components used are rated for at least 150% of their intended use.

QUALITY CONTROL: In-house construction of critical components like transformer and chassis, as well as total assembly, allows **LINEAR POWER™** to maintain uniform quality. **100%** of the finished units are tested, then burned in for four hours, and tested again. Amplifiers, which pass this rigorous test, have truly earned the **LINEAR POWER™** logo.

MOUNTING

1. The amplifier will work best if it is kept as cool as possible. Mount in a position that would allow the circulation of air into the intake side of the fan and allow the exhaust side to blow freely into the trunk or open area.

2. Wire all connections as shown in instructions. Connect fan power plug to the amp. Place fan shroud into position over amplifier and mount securely. Be sure fan shroud does not touch the case of the amplifier as this might cause unwanted noise due to vibrations.

WIRING

1. Disconnect the negative ground cable from your vehicle's battery before making any power connections.

2. Connect the negative power wire from the amp to a solid frame member via bolt or self-tapping screw. This connection must be to a clean, unpainted surface. Always attach the ground wire first when installing this amplifier, and disconnect the ground last when removing this amp from the system.

3. A fuse of the proper size must be installed in line with the power wire to protect the vehicle's electrical system. It should be connected to the battery's positive terminal. Use the fuse and fuse holder provided and replace only with the proper type and size.

WARNING: USE OF OVERSIZE FUSE WILL VOID THE WARRANTY

4. The other end of the fuse holder should be connected to the positive power lead of the amp. To extend the length of the wire, use only the same size or larger wire.

5. The red and white wire acts as a remote turn-on for the amp. It should be connected to a switched lead such as the power antenna lead from the radio. If

multiple amps are to be used in the system a relay should be added to the system to assure proper current needed to turn on several amps.

FOUR-OHM CAPABILITY

As shipped from the factory, the **4.1HVS©** will be set up to run an **8-ohm mono** load. To correctly run a **4-ohm mono** load, remove the cover and change the power supply taps to the **4-ohm taps** located on the board next to the **8-ohm taps**. There are **NO** power increases for running the lower 4-ohm load; this is done for convenience if you already have a 4-ohm speaker arrangement. There are efficiency losses and higher current consumption to run the amp into a 4-ohm load. **Not** selecting the proper 4-ohm power supply taps before running the amplifier into a 4-ohm load **WILL DAMAGE** the amplifier and **void all warranty**.

RUMBLE FILTER

As shipped from the factory the adjustable rumble filter is set in the off position. This allows the amplifier to play as low as **10Hz** designed for systems, which utilize sealed enclosures. Moving this switch to the**" ON"** position will set the low frequency cut off to **36 Hz** for systems utilizing ported enclosures.

SPEAKER OUTPUT

The speaker output connector on the **4.1HVS©** is only one pair of 5-way binding posts. Attach a lead from the positive terminal of the speaker to the speaker positive terminal on the speaker output connector of the amplifier, repeat for the negative side. The 5-way binding posts should have a red color band for positive and a black color band for negative. The speaker terminal, with the terminal facing you, fins up, from left to right, is as follows:
SPEAKER (+); **SPEAKER (-)**

NOTE: IN ADDITION TO THE IMPEDANCE REQUIREMENTS THAT MUST BE MET FOR SPEAKERS USED WITH THIS AMPLIFIER, THE COMBINED CONTINUOUS POWER HANDLING CAPABILITY OF THE SPEAKER (S) USED IS RECOMMENDED TO BE AT LEAST **1000 WATTS** FOR SAFE OPERATION.

GAIN ADJUSTMENT

In a basic system, using a single amplifier, set the amp to minimum, turn the deck up until it just starts to distort, then back the deck down slightly. This is the point where the output of the deck is cleanest. Now, bring the gain of the amp up until it just starts to distort, and back it down slightly. This will allow the deck and amp to reach maximum useable output at the same time.

WARNING

Your new **LINEAR POWER™** amplifier, when used in conjunction with many of the efficient speaker systems on the market today, can produce sound pressure levels that are considered harmful to your hearing.

Exposure to loud music may lead to loss in hearing. This effect may not be readily appreciated because the damage to hearing is progressive.

Those who are exposed to excessive sound pressure should utilize direct individual protection in the form of earplugs or earmuffs, which are specifically designed for noise reduction.

In accordance with the **OSHA** (Occupational Safety and Health Act) regulations for noise levels as they relate to the work area, excessive sound pressure is defined as **115 db** (a) continuous for any length of time.

We recommend that you exercise restraint while enjoying the performance of this and other high-powered mobile audio equipment.

GENERAL TROUBLESHOOTING

NO SOUND: Check all connections. Check main power fuse. Check assessor fuse. With a trouble light or meter, be sure +12V is present at the amplifier on the large positive cable and on the small red/white turn-on wire. Check for a good ground connection. Check by substitution or other method for proper operation of music source.

BLOWS FUSES: Check all connections to be sure all power wires and speaker wires do not touch ground or each other. Re-check polarity of main power wires.

SHUTS OFF: As this amplifier is equipped with a thermal and a short circuit shutdown system, in the unlikely event of excessive temperatures due to high ambient temperature or improper speaker impedance, the amp will turn itself off. To avoid damage to the speakers, turn the volume to a minimum while waiting for the amp to turn itself back on.

BUILT IN NOISE SUPPRESSION

The vehicle's battery forms a huge capacitor bank that does a fantastic job of filtering noise. Unfortunately, batteries grow old and lose their ability to hold a charge. At the same time, they lose their ability to filter noise; even corrosion on the battery terminals will cause increased noise as it isolates the battery.

If the vehicle is in need of ignition repair or tune up, increased noise will result. Specifically, check the condition of points and condenser, as well as the spark plug leads. Don't forget to check for resistor plugs, too.

TROUBLESHOOTING NOISE

Once the type of noise has been determined, the entry method must be isolated. The easiest place to start is the amplifier. Unplug the RCA jacks and listen for a change in the noise level. If little or no change occurs, the amplifier's power is contaminated. If the noise is gone, the possibilities are a ground loop or a noise problem earlier in the system. If the problem is a ground loop, the best solution is a better ground for the amp(s). Another solution is to carefully connect a wire from the shield of the RCA connector, at the amplifier end, to a good ground on the vehicle. This will effectively short circuit the ground loop.

The next check is for radiated noise. With the deck still electrically connected to the vehicle, slowly remove it from its installation, and listen for a change in noise level. Any reduction would indicate that noise was being radiated directly into the deck while it was in the dash. If you are dealing with radiated noise, the only solution is isolation. The easiest method is usually to move the contaminated wiring away from the stereo's wiring.

The best way to eliminate power line noise is to install a filter capacitor across the noise source. The best capacitors to use are .5mfd 25v bypass capacitors for the coil, as well as any accessory motors, and .1mfd 100v ceramic disc capacitors for switches. Another way to suppress power line noise is with noise filters.

SERVICE OR REPAIR

To obtain service or repair, please contact our authorized **LINEAR POWER™** product service center:

T.I.P.S. INC.
3455 Lanell Lane, Pearl, MS 39208
(601) 932-8477
E-mail: ray@tipsinc.net

SPECIFICATIONS

4.1HVS©

RATED POWER @ 8 OHMS	75 WATTS
RMS Continuous (8 Ohm mono) @ 12.5 volts	1250 WATTS x 1
RMS with music (8 Ohm mono) @ 14.4 volts	1500 WATTS x 1
Maximum Peak Power	4 HP*
THD 20Hz-20KHz	0.04%
RISE TIME (SLEW RATE)	16 V / microsecond
FREQUENCY RESPONSE	3 HZ to 20 KHz
DAMPING FACTOR 8-OHMS/4-OHMS	220/110
HEADROOM	3 dB
SIGNAL TO NOISE RATIO	100dB
FUSE RATING	60 Amp
CURRENT DRAW (amps)**	
8 OHMS	90
4 OHMS	120
Idle	1
DIMENSIONS H x W x L	3.5"x9.5"x17.5"

*HP=horsepower a mechanical unit of power equal in the USA to 746 watts
Peak current draw can be **much higher than the average current draw as stated above.

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