# Film-Tech

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# Installation and Service Manual

## TA225 & TA425

CINEMA POWER AMPLIFIERS

SMART
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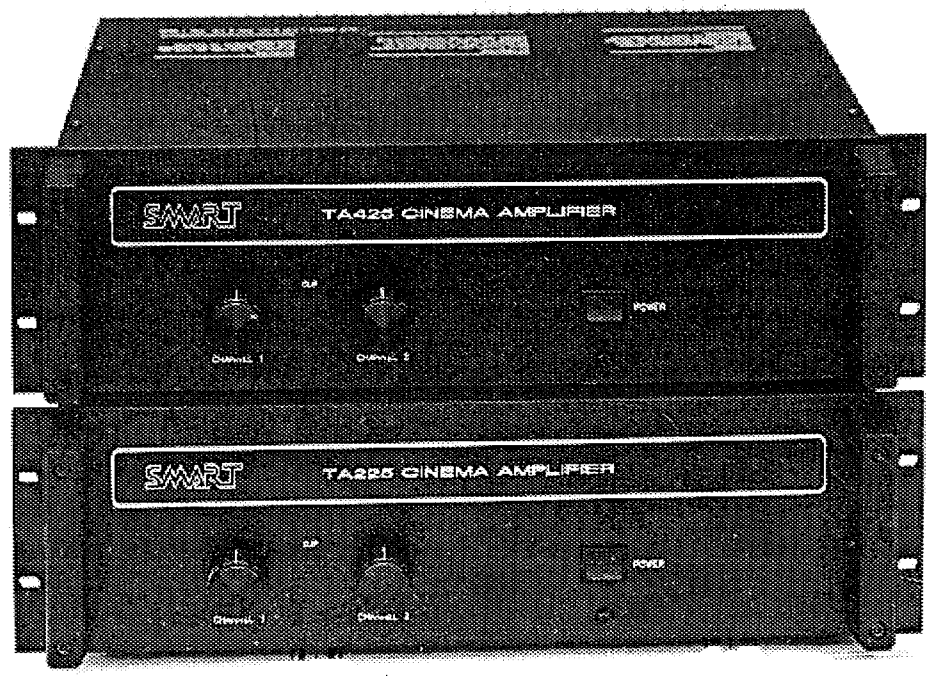
# TA225 and TA425 Cinema Power Amplifiers

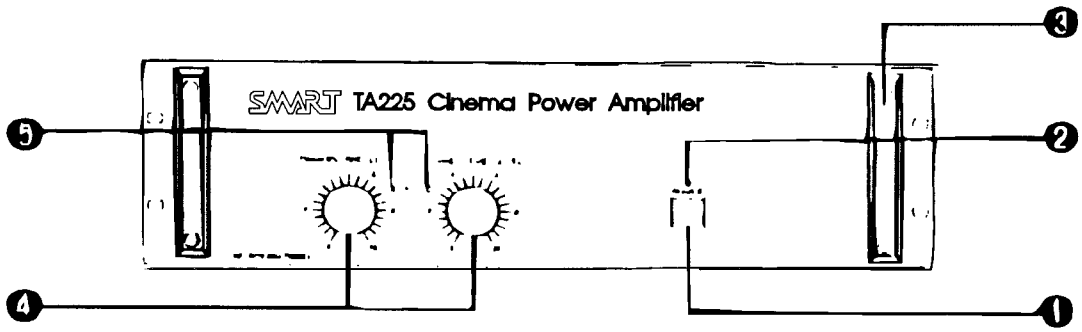
Installation and Service Manual



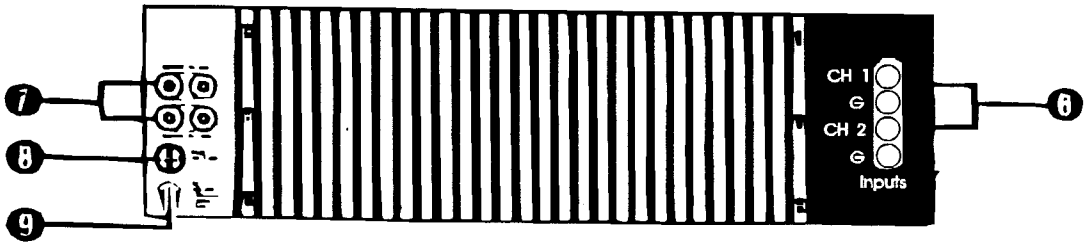

**Circuit Description**

To assure absolute long term reliability, the output section of each channel incorporates 6 Toshiba Multiple Emitter Power Transistors, which provide 900 Watts of power dissipation per channel. The output stage is arranged in a quasi-complimentary format and biased for class AB/2 operation. The bias current is evenly distributed among all output devices. Bias thermal compensation is accomplished by thermally mating a bipolar semiconductor junction to the heat-producing output devices. Triple diffused high power driver transistors are employed along with high speed, high voltage silicon annular devices for the predriver and inverter stages. Utilization of these components provides the required separation of break points for absolute stability. Fully complimentary current source drive and loading is utilized throughout. Only 20 dB of negative feedback is used to reduce forward transfer distortion to minimum levels. Vi type energy limiters are incorporated for short circuit protection of the amplifier. Due to the unusually large safe operating area of the output stage, the limiters do not actuate until driving a forty-five degree reactive load of under 2 ohms at full power.

# TA225 & TA425 Cinema Amplifiers




-REAR PANEL-




**FRONT:**

**1 - Power Switch**
**2 - Power Indicating LED**
**3 - Handles**
**4 - Level Controls**
**5 - Clip Indicators**

**REAR:**

**6- Input Connections**
**7 - Output Connections**
**8 - Fuse Holder**
**9 - AC Power Cord**

## Construction

The SMART TA225/TA425 is designed to an all-modular concept permitting rigorous preassembly module testing and maximum service accessibility. Each functional module is fully tested before final assembly. Although components of the highest quality are used throughout, each amplifier is burned in prior to shipment at the worst case operating point to eliminate any possibility of component malfunction. Six screws allow removal of the rear panel with the channel amp board intact. All chassis components are precision machined from high quality aluminum and sheet steel stock. The entire package concept is directed toward maximum efficiency of space and structure, accounting for the TA225/TA425's compact size and light weight.

### Installation

All SMART audio power amplifiers are designed for mounting in a standard 19-inch equipment rack, or one of the many 19-inch rack-type portable cases available. The model TA225/TA425 requires 5 ¼i inches of vertical panel space, with 11 7/8 inches required behind the panel. Total depth, including handles, is 13-5/16 inches. The front panel is machined from solid aluminum stock, with a black anodized grained finish and sturdy rack mount handles.

Placement of the amplifier is not critical for normal operating conditions, provided that sufficient air flow is allowed to reach the heatsink array. If the unit is to be placed on a shelf, or a similar unenclosed area, allow four inches clearance behind the heatsink to permit vertical air flow through the array. For installation in a cabinet, allow an additional two inches above and one inch below the amplifier to permit air to be drawn around the back. If the amplifier is to be mounted in an equipment rack or cabinet with heat-producing equipment, be sure that environmental operating temperatures do not exceed 55 degrees C (131 degrees F). Should over heating occur because of inadequate ventilation, the temperature protection circuitry will automatically protect the amplifier. When a safe operating temperature is restored, the amplifier will return to normal operation.

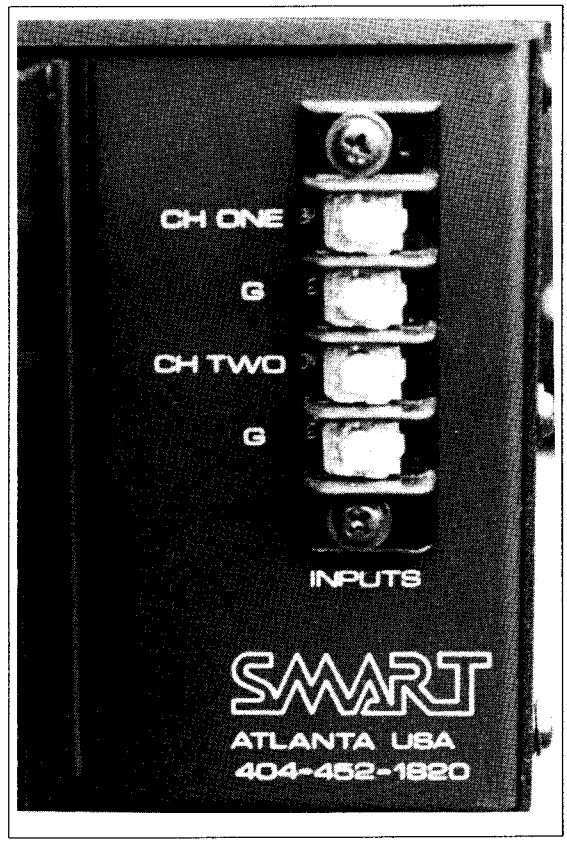
Because the TA225/TA425 is capable of delivering high power from a relatively small physical package, considerable heat can develop in cabinets containing several instruments. A good rule of thumb to adopt is to force-cool any enclosure containing four or more instruments.

### Rack Mounting

The four (4) rubber feet on the bottom of the amplifier allow the product to be used on a shelf or on top of other equipment, such as a loudspeaker enclosure. If the TA225 or TA425 is to be rack mounted, the rubber feet should be removed so the amplifier will clear a 5¼ " opening in the rack.

### Power Connections

The TA225/TA425 includes a power transformer for operation from 100-125 volt 50-60Hz mains supply. (Option 220VAC 50-60Hz)




Equipment for domestic (USA) consumption includes a captive power cord with a three in polarized plug. **DO NOT REMOVE THE CENTER GROUNDING PIN.**

In new cinema installations and portable sound systems, or any situation in which the main power is suspect, it is wise to confirm appropriate voltage and line polarity BEFORE connecting the instrument to power sources.

**Thermal Protection**

Certain conditions of operation (restricted cooling airflow, sustained high power operation into low impedance loads) can result in a rise in output device case temperature sufficient to affect any amplifier's performance.

Should the heatsink reach 95 degrees C, the output will be automatically disconnected from the (loudspeaker) load, and will remain disconnected until the temperature drops to below 95 degrees C. The action of removing the load has the effect of eliminating the output current, which, in turn, results in an immediate and rapid drop in temperature. The load will automatically be reconnected when the temperature drops to below 95 degrees C.

## UNBALANCED INPUT CONNECTIONS

Unbalanced inputs connect directly to the channel one and channel terminal input strips. The terminals are clearly labeled for each channel.

Bridged mono operation is easily achieved feeding the two inputs of the dual channel amplifier with a balanced audio source. Both of the front panel gain controls are used to set the level. Make sure both controls are in approximately the same position.

## OUTPUT CONNECTIONS

Output connections are to five-way binding posts, which are identified


as to polarity with a red and a black terminal. We suggest the use of dual banana plugs as a convenient and reliable method of hook-up. They allow rapid removal for polarity reversals, which is handy in the check-out and adjustment of multi-element biamplified and triamplified sound systems. Heavy Class 11 wire may be used by unscrewing the large plastic portion of the output terminal and inserting the wire into the hole provided. It is extremely important when making wire connections that no wire strand or end touches the adjacent terminal, shorting the output.

**CAUTION:**
Never strap the two red output terminals together (in parallel). Also, never connect either red output to chassis ground.

**FUSE HOLDER**
This fuse holder contains AC primary fuse. Fuse should be replaced by same type fuse when this is blown out. If they continuously blow, stop replacing fuse and refer servicing to qualified personnel.

**AC POWER CORD**
Plug this AC input cord into AC outlet. TA225 and TA425 amplifiers shipped to other coutries have the AC plug cut off the cord to allow installation of the local AC plug type used in that country.

**CAUTION:**

The TA225/TA425 amplifier is a product of the most advanced technology and manufacturing techniques and is fully protected against overheating, input overload, and short or mismatched loads. But, as this is the case with any precision instrument, some care should be taken in the operation of the TA225/TA425. The following precautions should be noted, since damage resulting from their omission is not covered under the terms of the warranty.

***WARNING!***

*DO NOT PARALLEL THE TWO OUTPUTS OF EACH CHANNEL BY CONNECTING THEM TOGETHER, OR PARALLEL THEM WITH ANY OTHER AMPLIFIER OUTPUT. NEVER CHANGE A FUSE WITH THE POWER CONNECTED. UNDER NO CIRCUMSTANCES SHOULD THE AMPLIFIER BE OPERATED WITH THE COVER REMOVED. THERE ARE NO USER-SERVICEABLE COMPONENTS INSIDE. TO AVOID A POTENTIALLY DANGEROUS SHOCK,, KEEP THE COVER CLOSED.*

## Specifications TA425

**Type:** Two channel audio power amplifier

**Gain:** 28dB (each channel)

Continuous Average Power Output 250 watts per channel at 8 ohms - 380 watts per channel at 4 ohms - 650 watts at Bridged mono at 8 ohms.

**Frequency Response:** ±0.5dB 20Hz-20kHz
**Distortion:** No more than 0.25% THD or IM, 0.01W to rated power, 20Hz to 20kHz (typically 0.01 %)
**Hum and Noise:** 101 dB below rated output (unweighted 20KHz bandwidth)
**Input Sensitivity:** 1.6V RMS for rated output
**Input Impedance:** 15K ohms, nominal
**Input Connectors:** Industry standard terminal strips **(Unbalanced).**

### TA425 Performance Specifications

| IMP | Frequency Tested | # of Channels | THD | Output |
|---|---|---|---|---|
| 8 | 1 kHz | Both | 0.1% | 242 Watts |
| 8 | 20 Hz | Both | 0.1% | 230 Watts |
| 8 | 20 kHz | Both | 0.1% | 230 Watts |
| 4 | 1 kHz | Both | 0.1% | 350 Watts |
| 4 | 20 Hz | Both | 0.1% | 324 Watts |
| 4 | 20 kHz | Both | 0.1% | 324 Watts |

**Output Connectors:** Dual 5-way binding posts
**Controls & Indicators:** (Front Panel) AC main power switch,power-on LED indicator,Channel One and Two level controls
**Power:** 100-130VAC, 50-60 Hz (Option 220VAC 50-6OHz) 90W (idle), 1200W (maximum)
**Dimensions:** 5-1/4"H (1 3.3cm) 1 9"W (48.3cm)11 -7/8" (30.2cm) behind panel 13-3/8" (34cm) overall

**Weight:** 39 lbs (1 7.7kg)

## TA225 Performance Specifications

| IMP | Frequency Tested | # of Channels | THD | Output |
|---|---|---|---|---|
| 8 | 1 kHz | Both | 0.1% | 145 Watts |
| 8 | 20 Hz | Both | 0.1% | 128 Watts |
| 8 | 20 kHz | Both | 0.1% | 210 Watts |
| 4 | 1 kHz | Both | 0.1% | 217 Watts |
| 4 | 20 Hz | Both | 0.1% | 175 Watts |
| 4 | 20 kHz | Both | 0.1% | 210 Watts |

## Specifications TA225

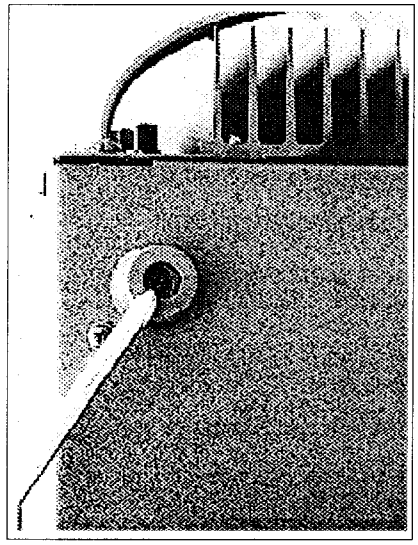
**Type:** Two channel audio power amplifier

**Gain:** 28dB (each channel)

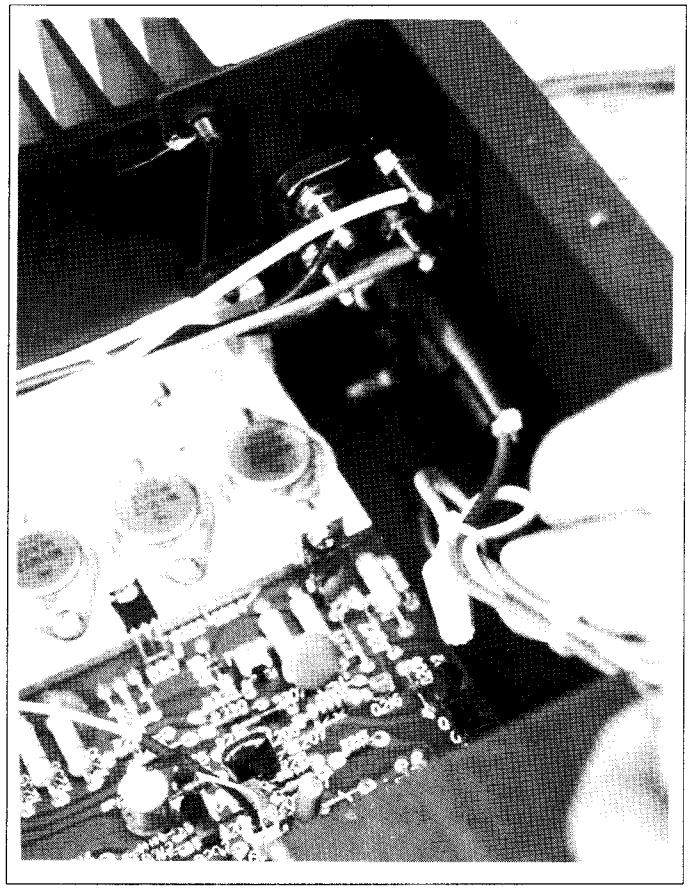
Continuous Average Power Output 125 watts per channel at 8 ohms - 210 watts per channel at 4 ohms - 490 watts at Bridged mono at 8 ohms.

**Frequency Response:** ±0.5dB 20Hz-20kHz
**Distortion:** No more than 0.25% THD or IM, 0.01W to rated power, 20Hz to 20kHz (typically 0.01 %)
**Hum and Noise:** 101 dB below rated output (unweighted 20KHz bandwidth)
**Input Sensitivity:** 1.6V RMS for rated output
**Input Impedance:** 15K ohms, nominal
**Input Connectors:** Industry standard terminal strips **(Unbalanced).**
**Output Connectors:** Dual 5-way binding posts
**Controls & Indicators:** (Front Panel) AC main power switch,power-on LED indicator,Channel One and Two level controls
**Power:** 100-130VAC, 50-60 Hz (Option 220VAC 50-6OHz) 90W (idle), 1200W (maximum)
**Dimensions:** 5-1/4"H (1 3.3cm) 1 9"W (48.3cm)11 -7/8" (30.2cm) behind panel 13-3/8" (34cm) overall

**Weight:** 35 lbs (15.9 kg)



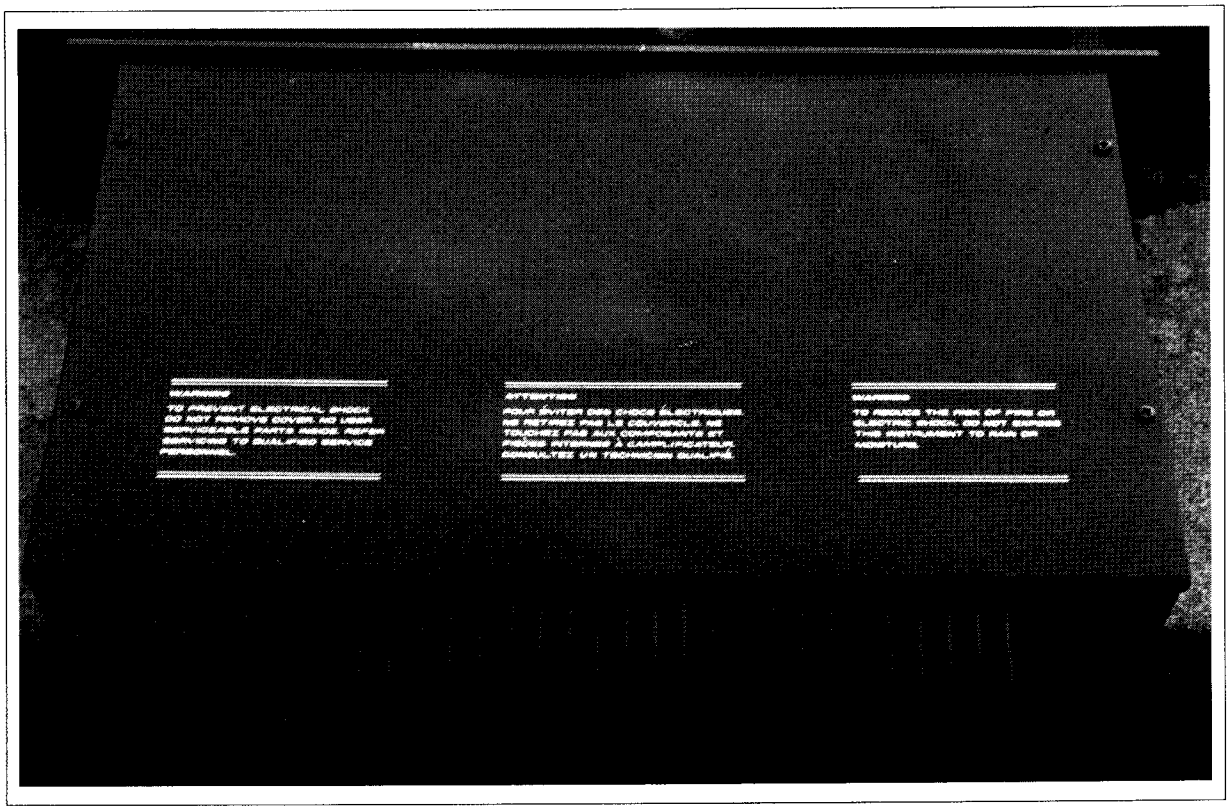
**A Phillips Head screw holds each of the rubber feet to the bottom of the chassis.**



**To change the AC voltage from 117 VAC operation to 230-240 VAC, disconnect the gray wire from the line cord while leaving the white wire connected to the line cord with the wire nut. Unsolder the red transformer primary wire from the power supply PC board lug and connect the red to the gray wire using an additional wire nut. The TA225 and TA425 will operate on 50 or 60 Hz line frequency.**

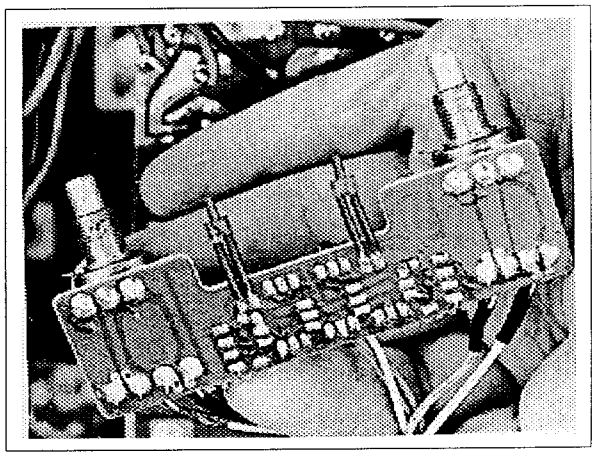
# SERVICE

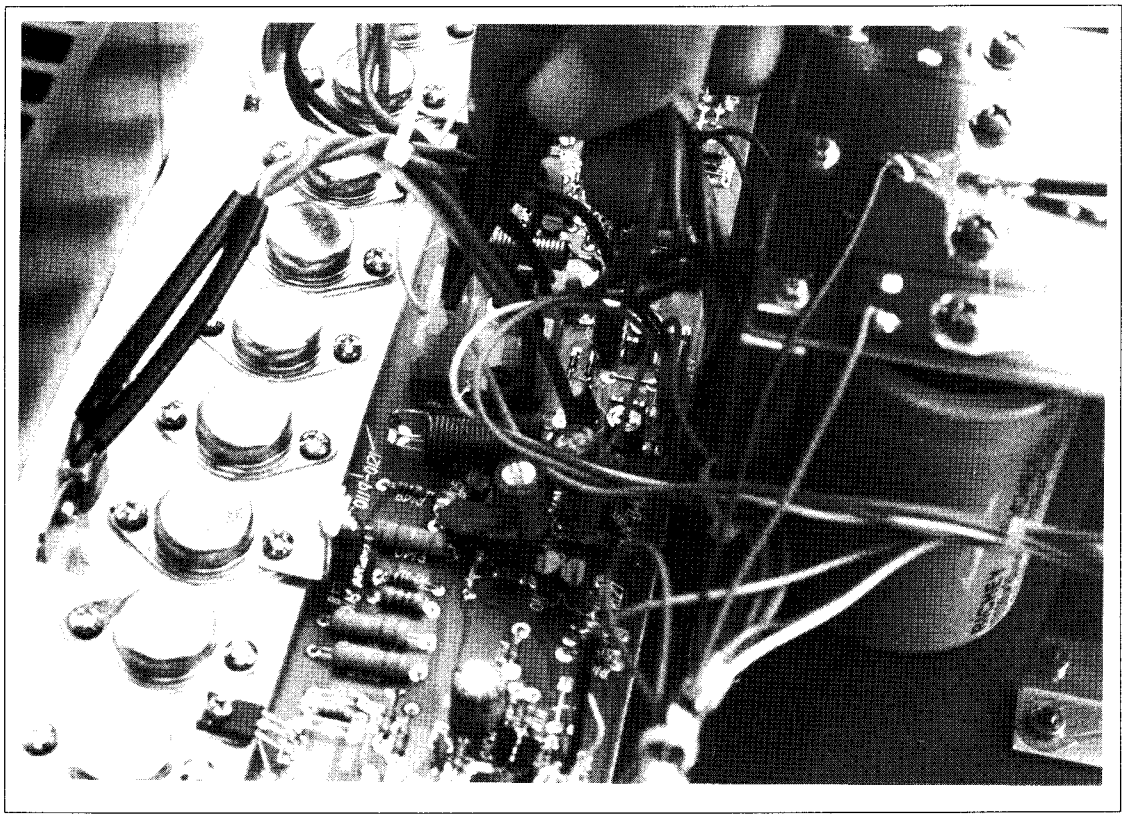
The SMART TA225 and TA425 power amplifiers are fully modular to allow quick repair in the field. Various sections of the amplifier unplug and may be returned to the factory for repair without having to send the whole amplifier.



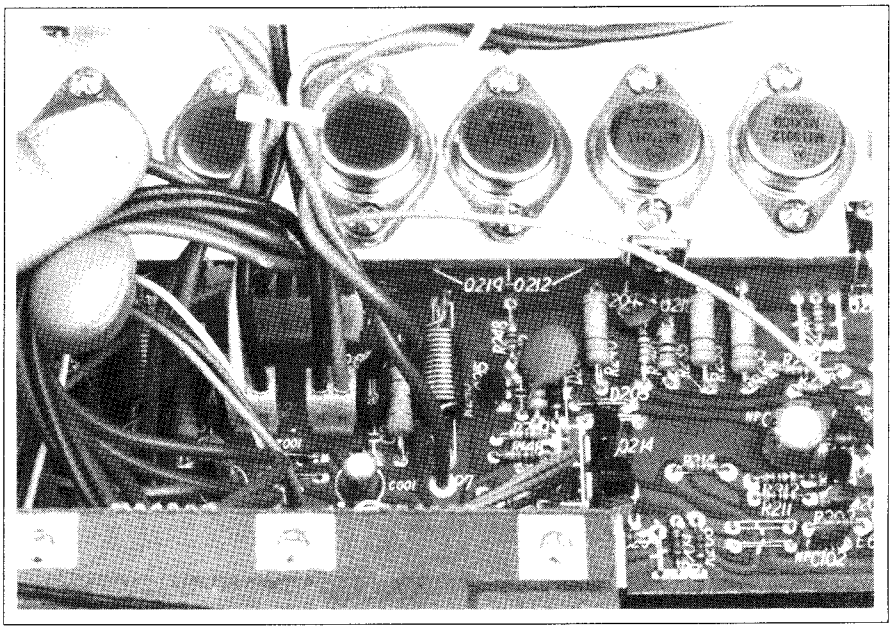
**Chassis top cover may be opened by removing 4 phillips metal screws.**

**Volume controls and LED clip lights are on a removable PC board on the from panel. Remove the pot nuts to release the PC board assembly.**



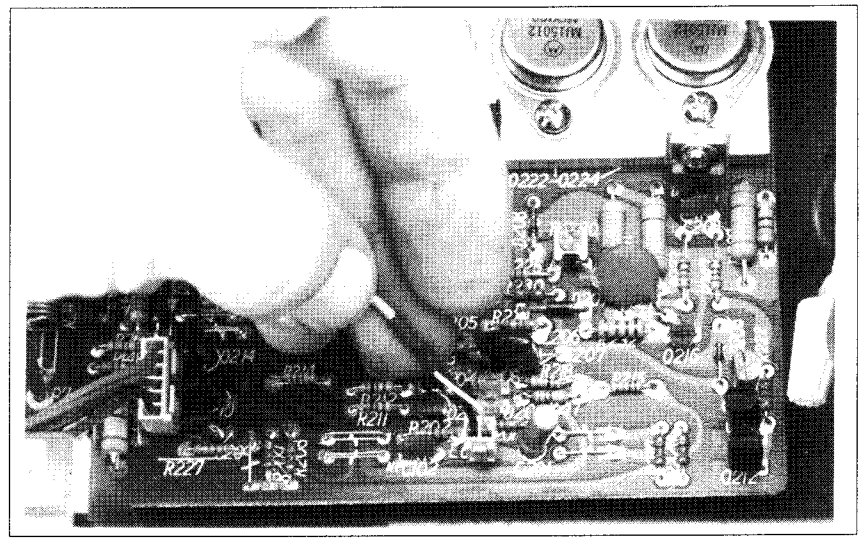


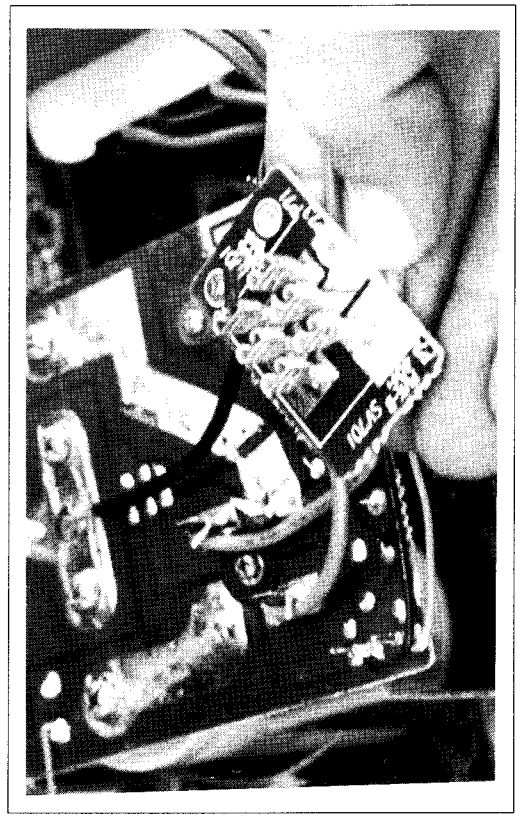
**Large plug disconnects power supply from the main amplifier module. Removing all plugs on the main card allows the heatsink, output transistors and main board to be removed from the chassis.**



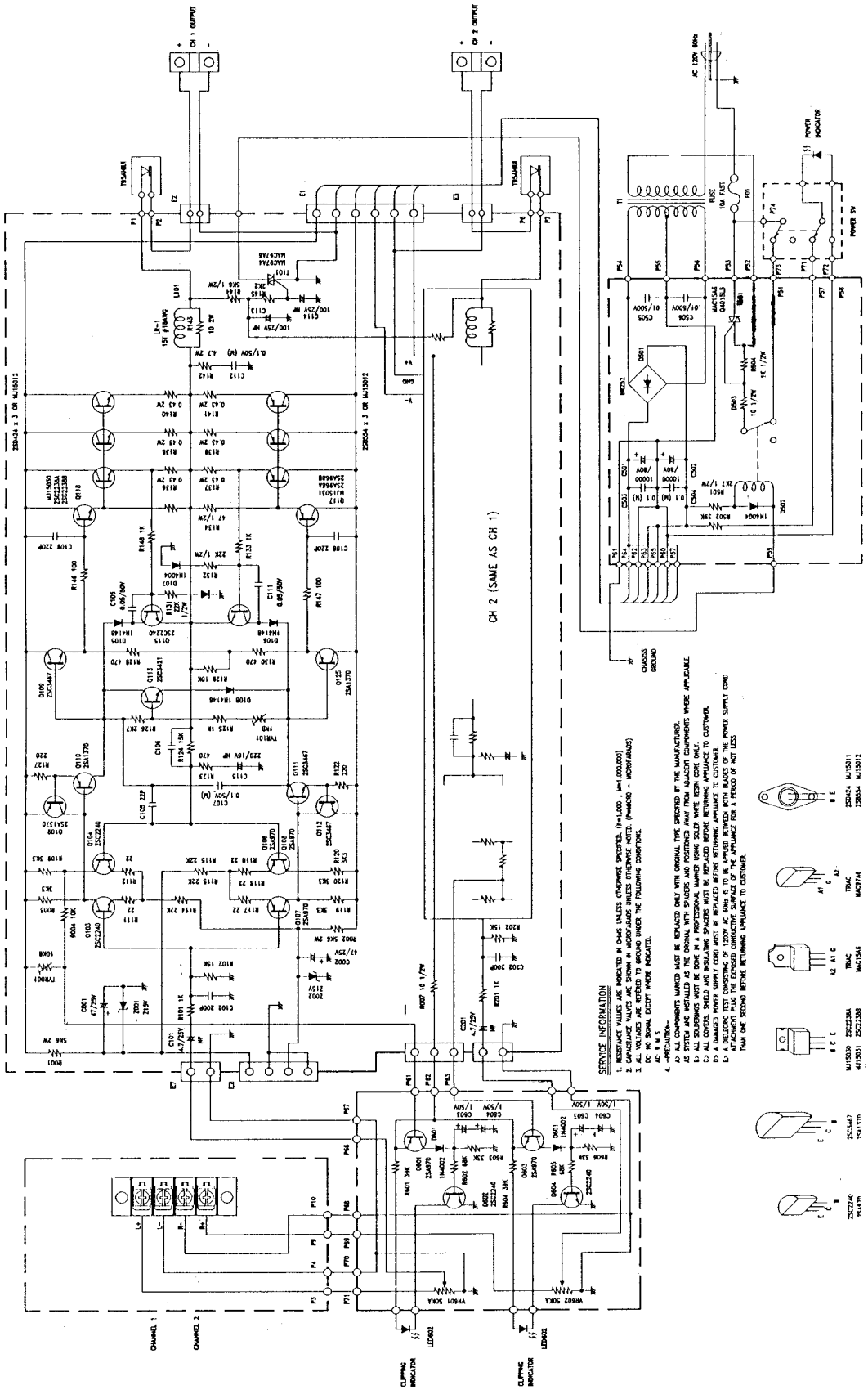

**Different view of main power supply plug.**

**Audio input cable from terminal strips connects to main board via a connector.**



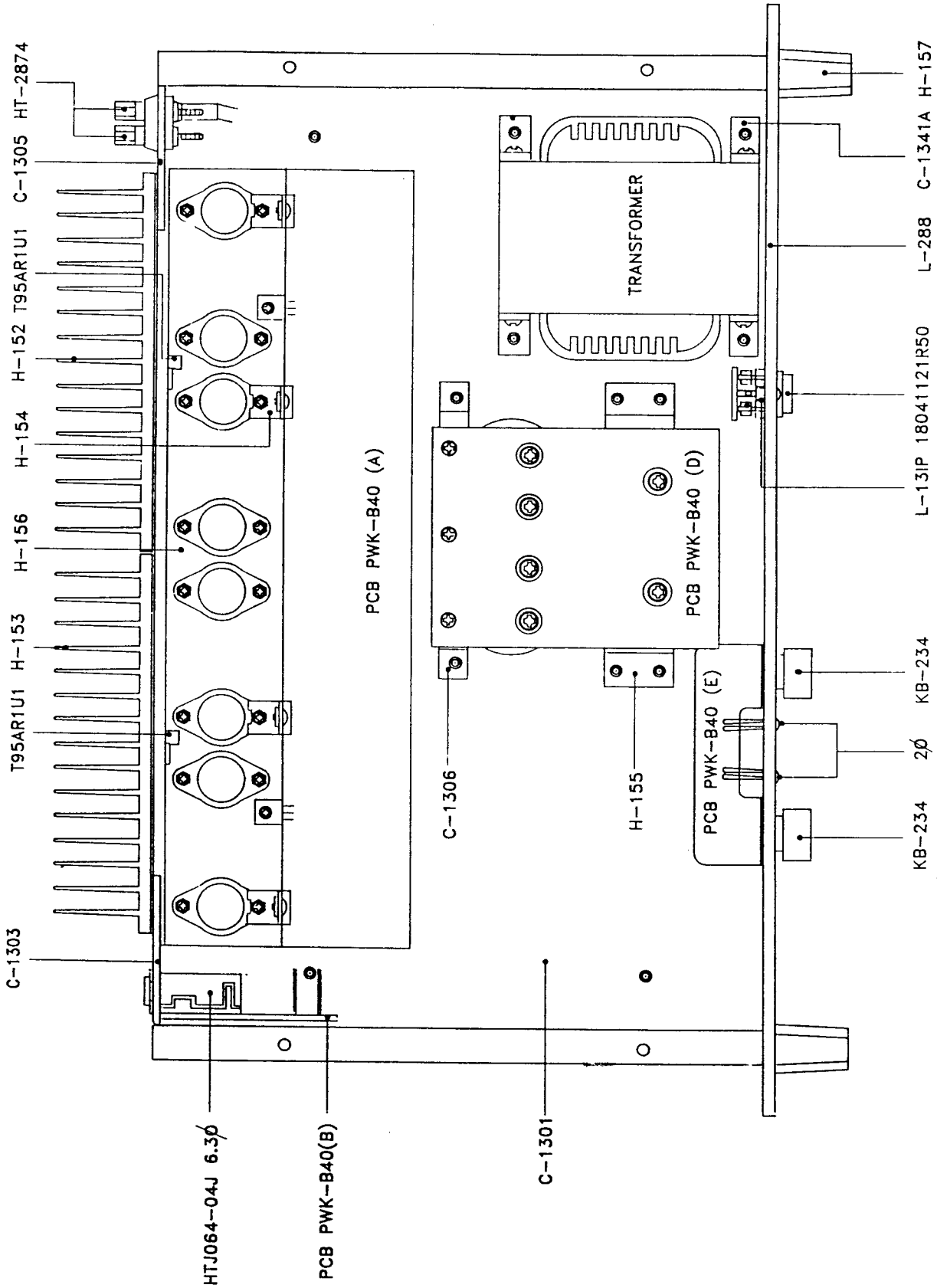



**Plug-on Printed circuit board on the AC power switch also holds power ON indicator LED**

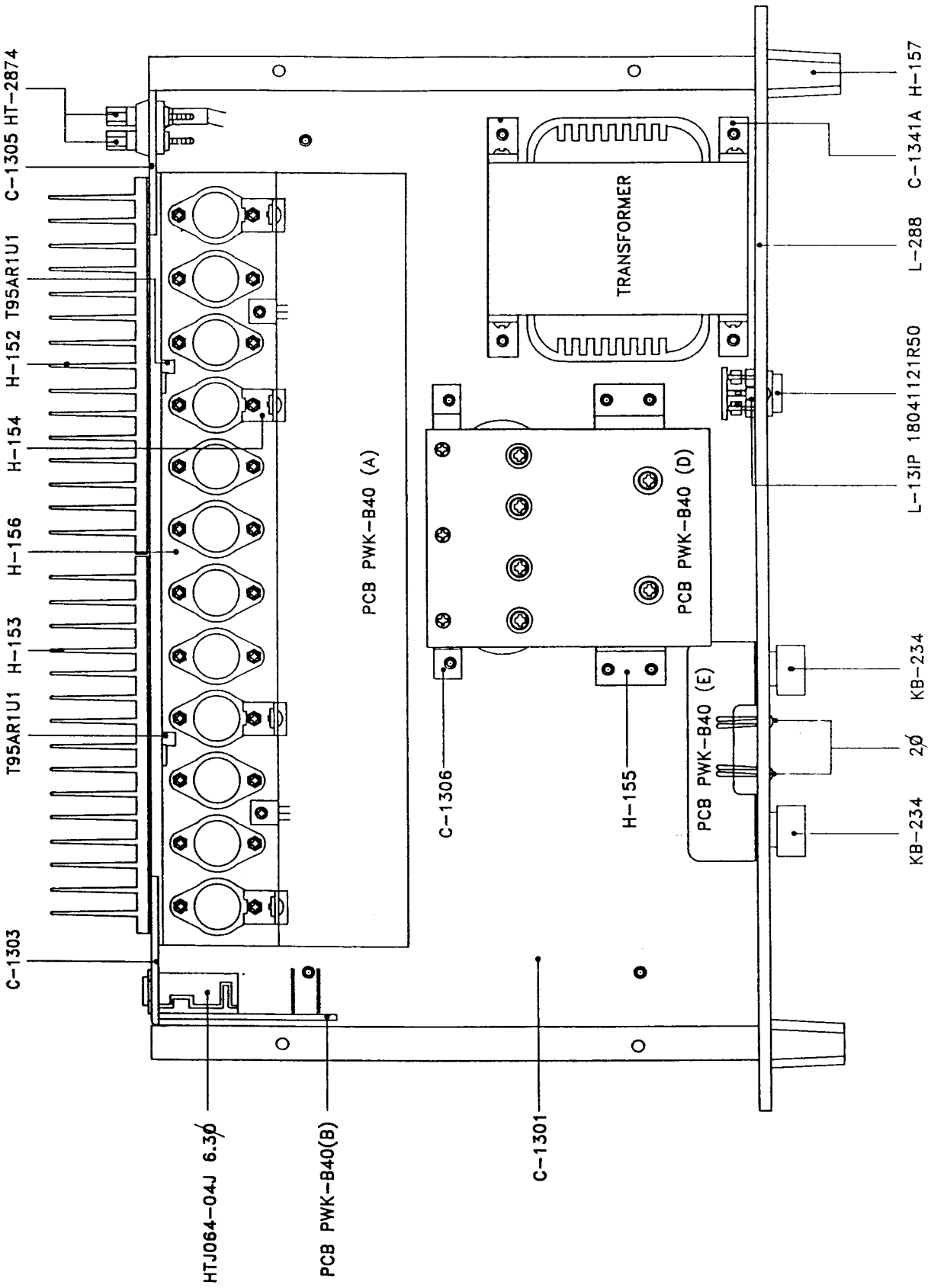



**Schematic for TA425 & TA225 Amplifiers**

# Parts Locator for TA225 Power Amplifier



# Parts Locator for TA425 Power Amplifier



# INSTALLING THE SC-1 SECURITY COVER ON TA225 AND TA425 AMPLIFIERS

1) Remove the knobs on the front panel using the proper size allen wrench.

2) Loosen both of the control shaft nuts with a 7/16ths inch open end or box wrench.

3) Slip the SC-1 security cover over both control shafts (under the nuts). See Figure 1.

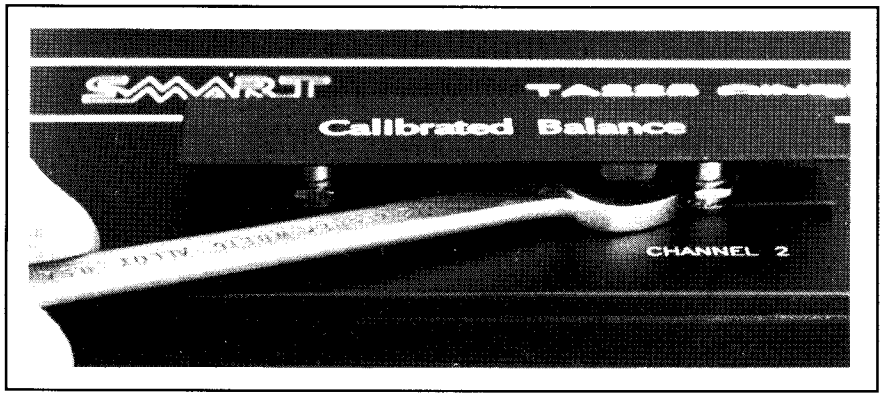



**FIGURE 1**

4) Set the amplifiers to the desired operating level for each channel. Often amplifiers are run with the fader control in the maximum position, and level to the amplifiers set at the stereo processor output.

5) Tighten the control shaft nuts with an open end wrench. (Figure 2)

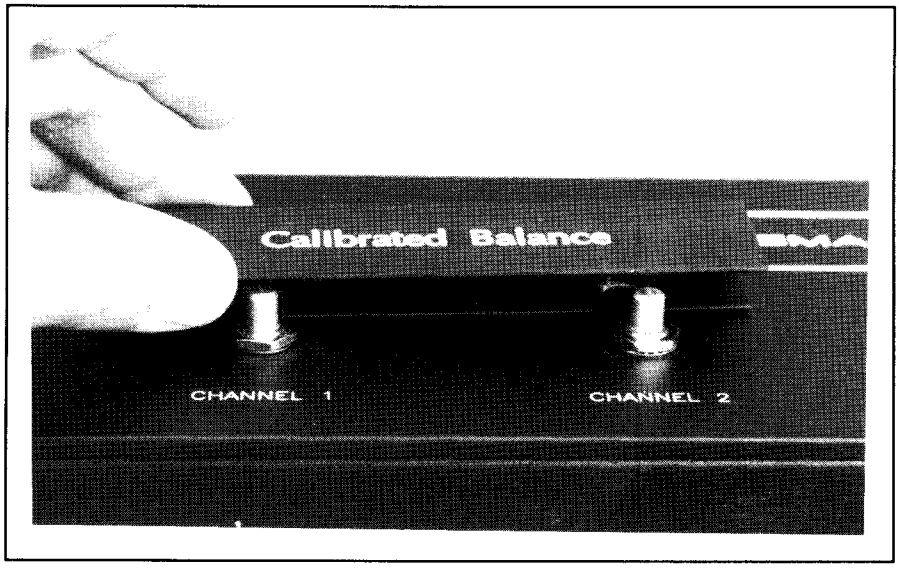



**FIGURE 2**

SMART

1-(800) 45-SMART or (404) 449-6698