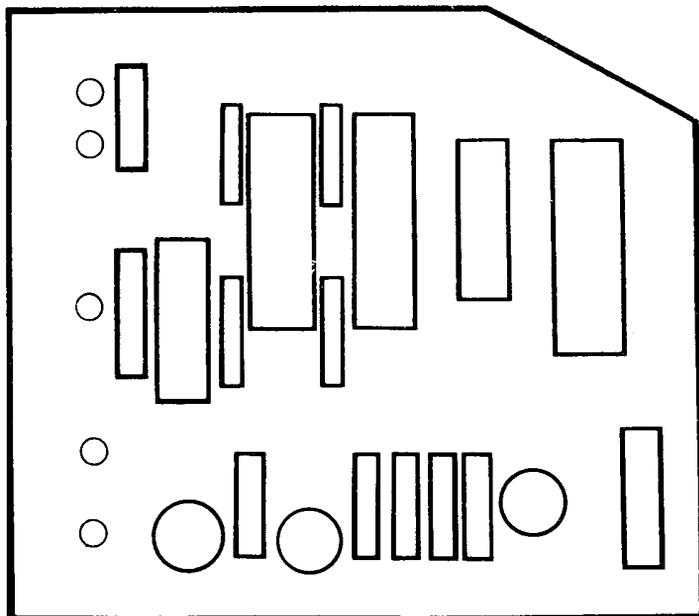


# OPERATION MANUAL



# CITATION B

PROFESSIONAL 80 WATT SOLID STATE POWER AMPLIFIER

## ***IMPORTANT***

Please read this manual carefully before installing and operating your new Citation B Stereo Power Amplifier. You have invested in a high quality electronic component and a few moments taken now to read this manual may save considerable time and effort later on. Keep this instruction manual readily available since it contains valuable technical and service information.

# OPERATION MANUAL

## CITATION-B

PROFESSIONAL 80 WATT SOLID STATE STEREO POWER AMPLIFIER

Citation Division

HARMAN-KARDON, INC.

• 55 Ames Court •

Plainview, L. I., N. Y.

# **INTRODUCTION**

## **THE CITATION B**

### **The Perfectionist's Amplifier**

The new Citation B is a unique power amplifier. As one high fidelity editor put it when he first saw the "B", "It is a computer that makes music". He wasn't far from wrong. The Citation B is engineered and constructed to computer standards. Each component is computer grade and must pass rigorous inspection tests for quality and uniformity. The chassis of the "Big B" is sub-divided into five assemblies to assure logical layout of components and to maintain minimum operating temperatures through efficient heat dissipation. Electrolytic capacitors, epoxy glass boards, transistors, heat sinks and power supply are all rugged and are rated many times over their normal application in the circuit. A laced military wiring harness couples each stage. A handsome brushed gold front panel matches the Citation A in appearance and permits custom installation of the amplifier within a cabinet or on a bookshelf. Included on the front panel is a power switch, a low cut filter, an idling current adjustment meter and a meter selector switch. Located beneath a special pull-away cover are four idling current adjustment controls to set the bias of the output transistors for optimum performance. Absolutely nothing has been spared to make the Citation B the most professional power amplifier ever designed.

The Citation B evolved from the famous Citation IIB vacuum tube basic amplifier. It adheres closely to the Citation philosophy of low distortion, absolute stability, high speaker damping and ultra-wide bandwidth for perfect phase linearity in the audio band. All contribute toward the superb tone quality of the "B". Through the use of hermetically sealed computer grade silicon output devices and through the elimination of all audio transformers, the Citation B permits the critical listener to take another step closer to the live performance. The tone quality of the "Big B" is totally transparent and immaculately clean.

# ***OUTSTANDING FEATURES OF THE NEW CITATION B***

- Carefully regulated heavy duty power supply (full wave bridge design) assures absolute stability and extended low frequency response.
- Computer grade “Callins” electrolytic and coupling capacitors with ten year service guarantee.
- Instrument type speaker binding posts.
- Hermetically sealed computer grade silicon output devices deliver exceptionally wide frequency response at full power output with low distortion.
- Metered output circuit with idling current adjustments located on front panel.
- Absolutely fail-safe operation with all types of speaker loads. Amplifier can take high power transient, short circuit or unloaded condition without damage to output stage.
- Perfect square wave response throughout entire audible spectrum — better than 1 microsecond rise time.
- Laced military wiring harness connects all stages.
- Unconditional TWO YEAR service warranty on all parts including output transistors.

## **UNPACKING**

After unpacking the Citation B, inspect it carefully for signs of transit damage. The amplifier was subjected to numerous rigid quality control inspections and therefore should be in perfect operating condition. If damage is visible, notify your dealer at once. If the amplifier was shipped to you, notify the transportation company. Harman-Kardon will cooperate with you in such instances, but only you can recover from the carrier for damages incurred during shipment.

## **WARRANTY**

We warrant each Citation B to be free from defects in material and workmanship under normal use and service, and in accordance with the conditions hereinbelow set forth, for a period of 2 years from date of delivery to the original purchaser, and agree to replace or repair any part or parts, returned to us within the said 2 years, with transportation prepaid and which our examination shall disclose to our satisfaction to have been thus defective. This warranty does not include free labor, nor is it applicable to any instrument which shall have been repaired or altered in any way so as in our judgment to affect its stability or reliability nor which has been subject to neglect, misuse, abuse, negligence or accident nor which has had the serial number altered, effaced or removed. Neither shall this warranty apply to any instrument which has been connected otherwise than in accordance with instructions furnished by us.

This warranty is expressly in lieu of all other warranties, express or implied, and of all other obligations or liability on our part, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of this instrument.

## **WARRANTY POLICY**

We urge you to fill in your warranty card and mail it to the factory without delay to protect your rights under warranty. The Harman-Kardon warranty is not valid unless we have your card on file.

## **SERVICE POLICY**

Harman-Kardon has established a special consumer division to answer all questions pertinent to the installation and operation of your unit. Please feel free to write us at any time and we will endeavor to offer prompt and complete advice.

If your problem cannot be resolved through our combined efforts we may wish to refer you to one of our authorized warranty stations. The unit must be shipped via Railway Express, Prepaid to the station designated, accompanied by a brief note describing the exact nature of the difficulty. **UNDER NO CIRCUMSTANCES SHOULD THE SET BE SHIPPED DIRECTLY TO THE FACTORY WITHOUT PRIOR AUTHORIZATION.**

## **POWER REQUIREMENTS**

Plug the line cord into any outlet furnishing 117 volts, 50 or 60 cycle AC current. The voltage may vary between 105 and 125 volts. An AC convenience receptacle is located on the rear of the chassis and is controlled by the ON/OFF switch.

# **INSTALLATION PROCEDURE**

## **VENTILATION**

The Citation B has been designed to be displayed on an equipment shelf or in a custom cabinet, in the same manner as a preamplifier or tuner.

When installing the Citation B on an equipment shelf the following precautions should be observed.

1. Allow sufficient space around the amplifier to permit unrestricted air flow for maximum circulation. This will insure low operating temperatures and will result in extended component life.
2. Do not place books or other objects on the cage or in the immediate vicinity of the amplifier.

When installing the Citation B into an equipment cabinet the following precautions should be observed.

1. Allow at least 8 inches above the top cover of the amplifier.
2. Allow at least 6 inches on each side of the chassis.
3. Cut the mounting shelf in accordance with the instructions on the mounting template.
4. Leave the back of the cabinet open to insure proper ventilation.
5. If the Citation B is installed in the same cabinet with vacuum tube units, make sure the amplifier is installed **BELOW** and not over the tube units.

## **CONNECTING THE SPEAKERS FOR STEREO OPERATION**

Your two speakers should be identical to obtain optimum results. Experts agree that a perfectly matched system offers the best stereophonic reproduction. The speakers should be placed along the same wall approximately 8 to 10 feet apart depending upon room size and furniture placement. It may be necessary to experiment with speaker placement until best results are obtained.

Use any type of stranded wire to connect your speakers to the Citation B. Lamp cord (zip cord) #18 gauge is excellent and may be dressed easily around the molding for an inconspicuous and neat installation. Do not drive the staples or tacks through the center of the wire for this may short out the two sections and will decrease the overall volume or short out the speakers entirely. It is permissible to use approximately 50 feet of speaker connecting wire for each speaker without loss of volume.

1. Connect one length of lamp cord to the left speaker. (This is the speaker on your left as you face the speakers and will now be referred to as Channel A).
2. Connect the other end of the lamp cord to the terminals marked, "SPEAKER CHANNEL A" located on the rear panel of the Citation B. The speaker output terminals are a high quality industrial type normally used on professional test equipment and are capable of accepting any type of wire termination such as a bare tinned wire, banana plug, spade lug, etc.
3. Similarly connect another length of lamp cord to your right speaker. (This speaker will now be referred to as Channel B).
4. Connect the other end of the lamp cord to the terminals marked "SPEAKER CHANNEL B".

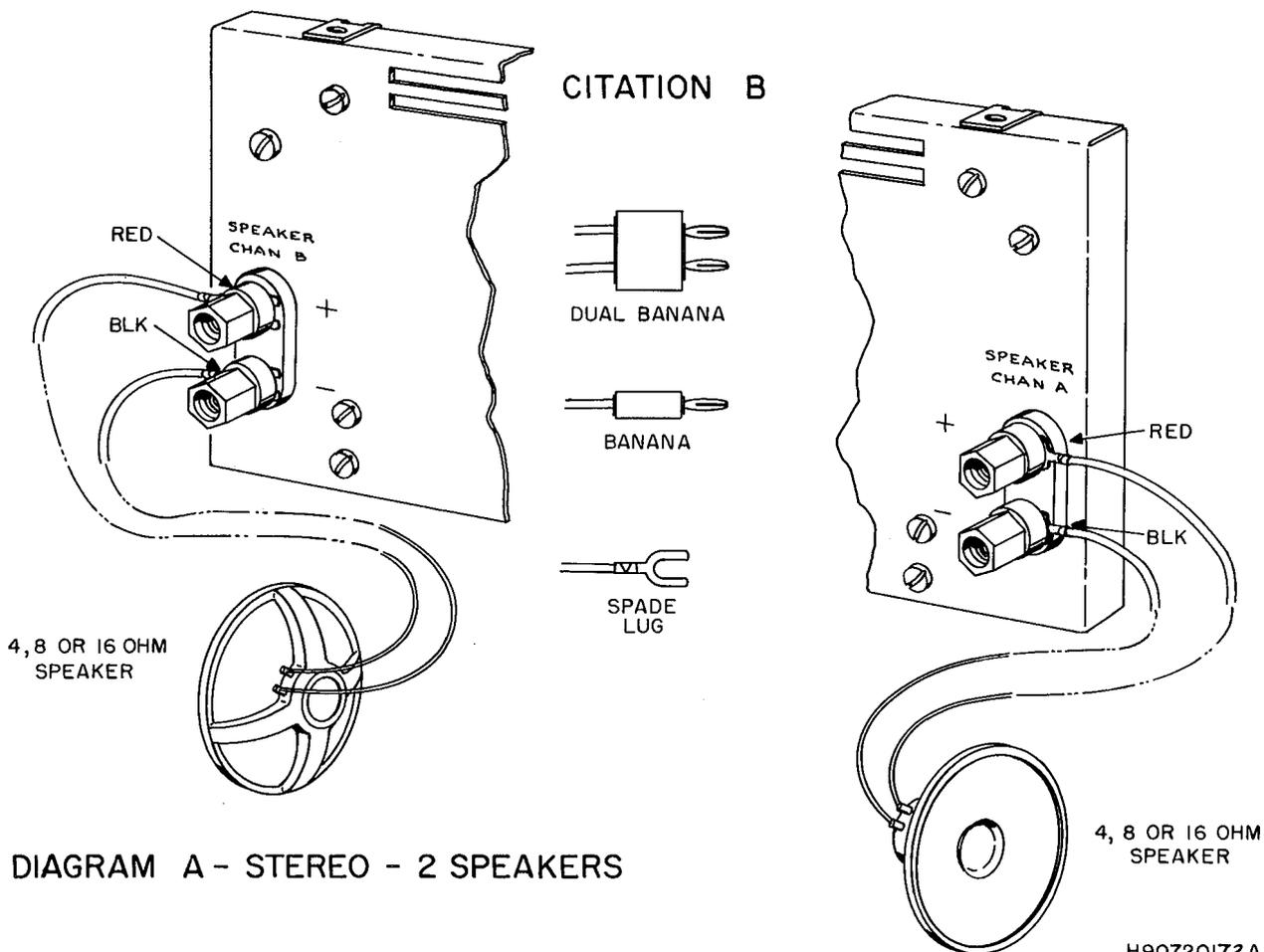
# SPEAKER PHASING

When more than one speaker is used in any music reproducing system, the speakers must be connected in a manner to work together. If one speaker is pushing while the other is moving in the opposite direction, this will result in diminishing bass response. Checking for proper phase and correcting if necessary is quite simple.

1. Place your preamplifier in the monophonic function.
2. Play a monophonic record. The sound should emerge from approximately the center area between the two speakers.
3. While the record is playing, change your preamplifier to the stereophonic function.
4. The sound source should now appear to come from both speakers as well as the center.
5. If your speakers are improperly phased, the sound source will not pinpoint itself between the two speakers when the control is in the monophonic position. Instead it will appear to come from both sides.

If you determine your speakers are out of phase, disconnect both leads from either the left or right speaker and reverse them. Your system should now be in phase.

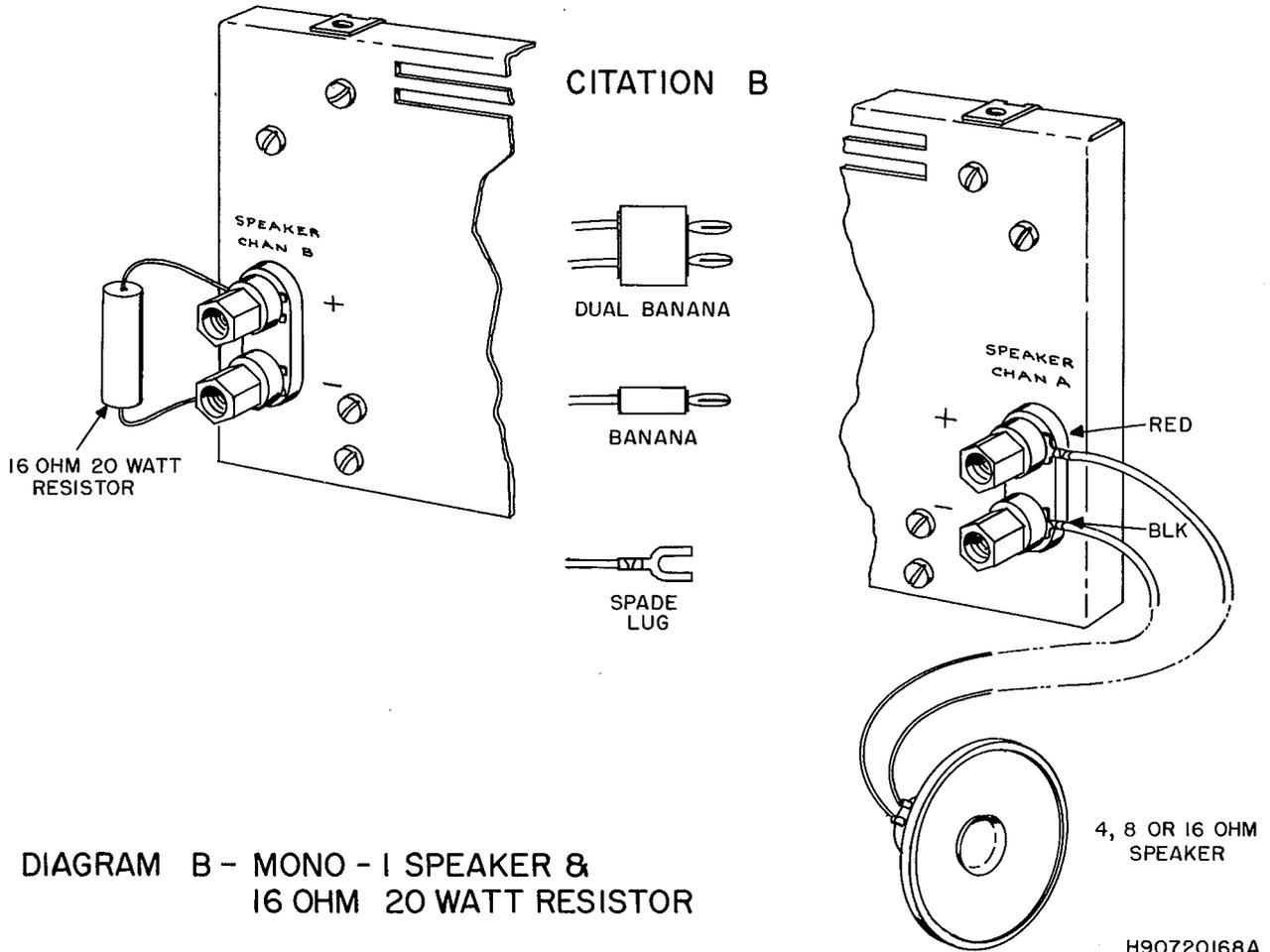
This completes your speaker connections. Since the Citation B does not contain audio output transformers, it is not necessary to match the impedance of your speakers to the amplifier. The Citation B will perform perfectly with any speaker which has an impedance of 4, 8 or 16 ohms. Refer to Diagram A for additional information and also to the paragraph on the use of the rear panel Speaker Selection Switch.



## CONNECTING THE SPEAKERS FOR MONOPHONIC OPERATION

If the Citation B is to be used monophonically and stereo is to be added at a later date, it is essential that both speaker output terminals are terminated into a proper load. Refer to Diagram B for proper installation of the loading resistor.

*AT NO TIME SHOULD THE OUTPUT TERMINALS BE PARALLELED FOR MONOPHONIC OPERATION.*



This is the only correct method for connecting a single monophonic speaker to the Citation B.

## CONNECTING THE PREAMPLIFIER

Standard patch cords with RCA phono plugs at each end should be used to connect your monophonic or stereophonic preamplifier to the Citation B.

Connect one patch cord from the left (Channel A) output of your preamplifier to the CHANNEL A input of your Citation B. Connect an additional patch cord from the right (Channel B) output of your preamplifier to the CHANNEL B input of your amplifier. **WARNING: DO NOT REMOVE OR MANIPULATE THE INPUT CONNECTIONS WHILE YOUR AMPLIFIER IS ON. THIS MAY RESULT IN DAMAGE TO YOUR AMPLIFIER OR YOUR SPEAKERS.**

## **SPEAKER SELECTOR SWITCH**

Although transistors do not require impedance matching, for optimum gain or sensitivity we have provided a special **SPEAKER SELECTOR SWITCH** which selects the correct amount of feedback for any impedance. Set this switch to the impedance rating of your speakers to obtain optimum results.

## **LOW CUT FILTER**

If for some reason you wish to roll off the low frequency response of this amplifier, use the special **LOW CUT FILTER** located on the front panel. This will effectively roll off the amplifier 6 db per octave at 10 cycles per second.

## **POWER ON/OFF SWITCH**

The Citation B contains a heavy duty rotary type power switch located on the front panel. It turns the amplifier on and off and also controls the AC convenience outlet located on the rear chassis.

You may connect the power cord of the Citation B to the switched AC outlet on your pre-amplifier. This will permit turning your entire system on and off without operating the Citation B power switch. This switch may now be turned ON at all times.

## **AC CONVENIENCE OUTLET**

This receptacle is located on the rear of the amplifier chassis and is controlled by the on/off power switch. Any type of auxiliary equipment may be connected to this receptacle.

## **IDLING CURRENT**

An idle adjust meter, meter selector switch and four idle adjust controls have been provided to correctly adjust the idling current of the four power transistors. Since the idling current adjustments affect the optimum performance of the Citation B it is recommended to become familiar with this simple adjustment.

A difference in the line voltage (105-130 volts A.C.) throughout the country makes it necessary to check and then readjust if necessary, the idling current of the four power output transistors. (Idling current has been factory adjusted at a line voltage of 117 volts A.C.)

The meter allows you to visually set the correct idling current when replacing or checking either pair of power output transistors.

**IDLE ADJUST METER:** The meter is used to separately measure the idling current in each of the four power output transistors.

**METER SELECTOR SWITCH:** The first position disconnects the meter from all circuitry. The other four positions select the power output transistor which corresponds to the idle adjustment control and meter reading.

**IDLE ADJUST CONTROLS:** These controls work in conjunction with the meter selector switch and adjust the idling current in each individual power output transistor.

# HOW TO CHECK THE IDLING CURRENT

1. Turn off the Citation B.
2. Remove the decorative panelette from the bottom of the front panel.
3. Remove the two input cables from Channel A and Channel B.
4. Do not disconnect the speakers.
5. Turn on the Citation B and allow the unit to operate for at least ten minutes until it reaches proper temperature.
6. The meter selector switch should be in the "OFF" position. Now rotate the switch through the next four (IDLE 1, 2, 3, and 4) positions. If the pointer falls within the brown area on the meter, no adjustment is necessary. If the pointer falls either below or above the brown area, an adjustment is necessary.

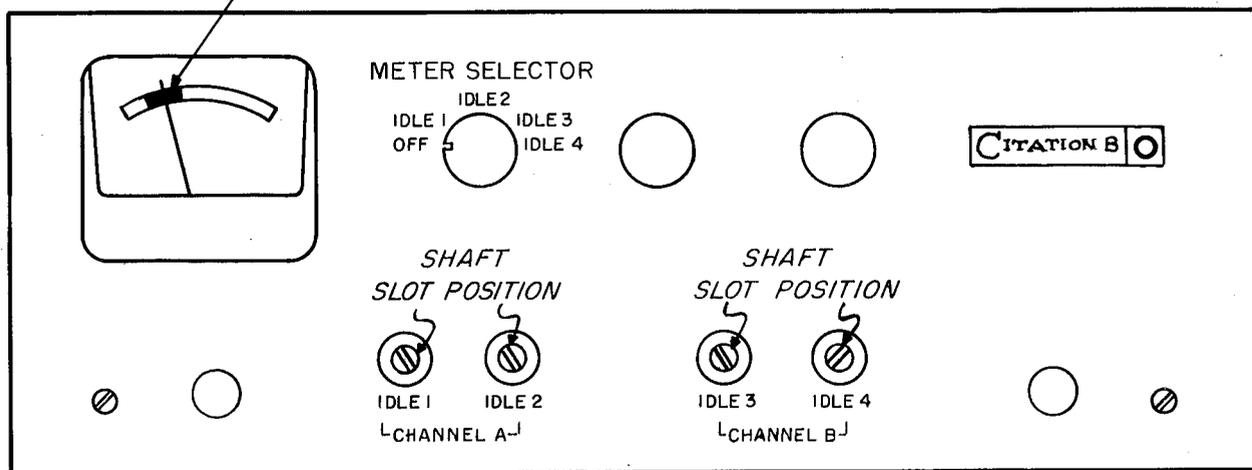
## HOW TO ADJUST THE IDLING CURRENT

NOTE: It is important when advancing or retarding a pair of controls (Ex. = Idle Adjust #1 and #2) to keep the degree of rotation of each control in equivalent positions at all times. Rotate one control a maximum of 10 degrees in a clockwise or counterclockwise direction, likewise rotate the other control of the pair 10 degrees in the same direction to an equivalent position. The pair of idle adjust controls being adjusted are mutually dependent upon each other as well as their related power output transistors and associated circuitry. The slots in both controls can be used as a guide when adjustments are made. See Diagram C.

Rotation of the idle adjust controls in a:

1. CW direction will raise the pointer reading of the meter.
2. CCW direction will lower the pointer reading of the meter.

BROWN AREA



CORRECT  
ADJUSTMENT

INCORRECT  
ADJUSTMENT

DIAGRAM C

H90720171A

*Handwritten notes:*  
 Black  
 Yellow  
 Brown  
 Idle-meter

1. Turn idle adjust Controls # 1 thru 4 to a fully counter-clockwise position.
2. Rotate the meter selector switch to the IDLE 1 position. Slowly adjust idle adjust controls # 1 and # 2 in unison until the pointer falls into the brown area of the meter. (Adjust both controls in 10 degree increments or less).
3. Rotate the meter selector switch to the IDLE 2 position. The pointer should now fall into the brown area of the meter if your adjustment was made correctly.
4. If the pointer does not fall into the brown area of the meter leave the meter selector switch in the IDLE 2 position. Readjust idle controls # 1 and # 2 in unison until the pointer falls into the brown area of the meter. (Adjust both controls in 10 degree increments or less).
5. Rotate the meter selector switch to the IDLE 1 position. The idling current for both transistors should now be correct for Channel "A".
6. Repeat Steps 2 through 5 to adjust the idling current for Channel "B" power transistors. Use meter selector switch positions IDLE 3 AND IDLE 4 along with idle adjust controls # 3 and # 4.
7. After both channels are properly adjusted, rotate the meter selector switch to the "OFF" position and install the front panelette.

# CITATION B

## REPLACEMENT PARTS LIST

| <i>Part Number</i> | <i>Description</i>                         | <i>Price</i> |
|--------------------|--|--------------|
| H24013764          | Power Switch                               | \$3.80       |
| H24018199          | Meter Selector Switch                      | 3.65         |
| H24018200          | Low Cut Switch                             | 2.60         |
| H21518204          | Idle Adjust Control                        | .80          |
| H65418213          | Banana Plug                                | .40          |
| H61217124          | Pilot Light Socket                         | .35          |
| H46512117          | Pilot Light #1847                          | .20          |
| H24018197          | Speaker Impedance Switch                   | 2.60         |
| H65411919          | Phono Socket                               | .10          |
| H65416751          | A.C. Convenience Outlet                    | .35          |
| H53013678          | Line Cord                                  | 1.80         |
| H65420059          | Fuse Holder                                | .85          |
| H45013202          | Fuse (3.5 amp-3AG)                         | .15          |
| H45012856          | Fuse (2.0 amp-3AG)                         | .15          |
| H65418195          | Speaker Output Terminals                   | 2.75         |
| H28018214          | Power Supply Terminal Board                | 2.60         |
| H28018260          | Printed Circuit Board (no components)      | 14.10        |
| H28018231          | Printed Circuit Board (no components)      | 14.10        |
| H31518185          | Electrolytic 1000 MFD-60 volt              | 2.90         |
| H31518186          | Electrolytic 500 MFD-40 volt               | 2.25         |
| H31518176          | Electrolytic 3000 MFD-100 volt             | 14.45        |
| H31518177          | Electrolytic 2000 MFD-100 volt             | 12.70        |
| H31519980          | Electrolytic 300 MFD-30 volt non-polarized | 2.25         |
| H31518183          | Electrolytic 50 MFD-30 volts non-polarized | 1.05         |
| H36718178          | Resistor 0.5 ohms—5 watts—5%               | .30          |
| H41015683          | Silicon Diode 600 volt PIV—0.5 amp         | 2.15         |
| H41020180          | Silicon Diode 300 volt PIV—10.0 amp        | 3.45         |
| H43019955          | Transistor Output (matched pair)           | 31.90        |
| H43018082          | Transistor                                 | 3.25         |
| H43018080          | Transistor                                 | 5.00         |
| H43020158          | Transistor                                 | 5.25         |
| H67018189          | Circular Heat Sink (Transistor)            | 2.25         |
| H85018259          | Mica Washer (Transistor)                   | .10          |
| H38019956          | Thermistor                                 | 1.85         |
| H10118188          | Power Transformer                          | 29.95        |
| H63018173          | Escutcheon                                 | 17.50        |
| H12518207          | Idle Adjust Meter                          | 18.35        |
| H63018175          | Removable Panelette                        | 7.85         |
| H63216767          | Knob                                       | 1.40         |
| H63418224          | Jewel (Red)                                | .50          |
| H60118194          | Top Cover (Brown)                          | 11.75        |
| H90718257          | Instruction Book                           | 3.75         |

NOTE: To speed handling of your order be sure to include both the model and serial numbers which appear at the back of the chassis, in addition to the quantity, part number and part description of the items ordered. Orders from independent dealers, independent servicemen, and retail customers will be shipped on a C.O.D. basis except for orders \$1.00 or less, for which remittance should be enclosed. Prices subject to change without notice. Harman-Kardon reserves the right to substitute equivalent parts for those originally installed in this chassis.