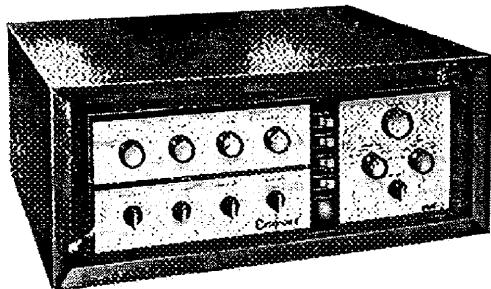


# OPERATION MANUAL

CITATION I  
STEREOPHONIC PREAMPLIFIER  
CONTROL CENTER



harman kardon

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OF  
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## INTRODUCTION

The Harman-Kardon Citation I Stereo Preamplifier represents the culmination of extensive research and experimentation. The keynote is unparalleled performance, and no compromise has been made in the design of this magnificent instrument. Every feature demanded by the professional has been incorporated, and several new ones added. Each is important to the proper operation of your system.

This booklet has been written in simple non-technical language, and if you will take the time to read it first before doing anything else, you will find it simple to obtain optimum performance.

Keep this booklet available at all times. It contains indispensable technical and service information.

## FEATURES

- Separate Bass and Treble step-type tone controls for each channel. Controls completely out of the circuit when in the flat position to eliminate phase shift and transient distortion inherent in all tone controls. Special treble cut contains scratch filter for sharp roll-off without ringing.
- Each amplification stage is flat over an extremely wide range and is surrounded with a feedback loop.
- Unmeasurable distortion and phase shift.
- D.C. on all heaters and the use of low noise resistors in critical places to reduce thermal agitation and hum.
- Anode follower outputs insure extended low frequency response by including the output coupling condenser in the feedback loop.
- All operating controls arranged in logical grouping to facilitate operation.
- Chassis designed to permit easy accessibility to all connections.
- Preamplifier can be installed into a cabinet by merely sliding the chassis in from the front. Escutcheon remains fastened to the chassis, eliminating the need to mount it separately to the wooden front panel.
- 18 stages utilizing 9 dual triodes.
- Silicon diode rectifiers for B+ and filaments.
- Separate turnover and roll-off equalization controls for virtually any combination of record or tape playback equalization curves.
- Continuously variable blend control acting as a third channel gain control or as a crossfeed control if a center speaker is not used.
- Zero to infinity balance control offering full range and complete cut-off for either speaker.
- Military construction throughout for rigidity and professional appearance.

## SPECIFICATIONS

FREQUENCY RESPONSE:	+0, -0.5 db, 5-80,000 cycles per second.
DISTORTION:	Less than 0.05% at 2 volts.
TOTAL NOISE:	High Level Input: 85 db below rated output. Low Level Input: Less than 1.5 microvolts referred to input terminals.
RATED OUTPUT:	Main Outputs: 2 volts. Tape Outputs: 0.3 volt.
INPUT SENSITIVITY:	High Level: 0.2 volt. Low Level: 2.5 mv. in Phono RIAA. 2.0 mv. in Tape Head position. Ceramic Phono: 0.1 volt.
FUNCTION SELECTOR:	Six positions: AUX, TAPE AMP, TUNER, PHONO 1, PHONO 2, TAPE HEAD.
MODE SELECTOR:	Five positions: STEREO, BLEND, A & B, MON A, MON B.
BLEND CONTROL:	Acts as crossfeed control in Blend position or 3rd channel gain control in Stereo position.
EQUALIZATION CONTROLS:	Two separate controls for Roll-Off and Turnover. Turnover: TAPE, 800/RCA, RIAA, LP, AES, 78. Roll-Off: 0/78, 4/FFRR, 10.5/OLD LON, 12/AES, 14/RIAA, 16/LP.
TONE CONTROLS:	Professional step-type controls for each channel. Out of the circuit in the flat position.
BALANCE CONTROL:	Zero to infinity type; frequency insensitive.
PHASING SWITCH:	To correct for improperly recorded program material or out of phase speakers.
CHANNEL REVERSE SWITCH:	Interchanges Channel A and B for proper listening orientation.
CONTOUR SWITCH:	Compensates for Fletcher-Munson effect at low listening level.
LOW FREQUENCY FILTER:	Three positions: FLAT, 15 cycle subsonic filter, 75 cycle rumble filter.
HIGH FREQUENCY FILTER:	Five positions incorporated into treble tone controls.
TAPE MONITOR SWITCH:	Permits monitoring of tape while recording.
POWER ON/OFF SWITCH:	Illuminated rotary type: heavy duty construction.
OUTPUT RECEPTACLES:	Two main preamplifier outputs. One third channel output. Two tape outputs for recording.
A. C. CONVENIENCE OUTLETS:	Total 4. Three switched; one unswitched.
TUBE COMPLEMENT:	Total 9. 4-ECC83/12AX7, 5-ECC81/12AT7. Plus 6 silicon diodes.
OVERALL DIMENSIONS:	14 $\frac{7}{8}$ " wide x 12 $\frac{1}{4}$ " deep x 6" high, less cabinet.
WEIGHT:	23 lbs.
FINISH:	Charcoal brown and gold.
CABINET:	Handsome walnut enclosure available as optional equipment.

## TECHNICAL DESCRIPTION

It is generally agreed that the control preamplifier is the heart of a high fidelity reproducing system and therefore requires special design consideration. A preamplifier that is designed to meet professional standards must be exceptionally versatile, easy to operate, and must not impart any coloration of its own to the program content.

The Harman-Kardon Citation I Preamplifier does not adhere to conventional circuitry and incorporates many advanced engineering innovations normally available only in the highest quality studio equipment. The unit consists of a group of circuit blocks called active and passive networks. Active networks are those which incorporate vacuum tubes and furnish amplification. Passive networks consist of resistors and condensers exclusively and do not amplify. An effort was made to carefully separate these circuit blocks in this preamplifier. The active networks are treated as one or two stage amplification units which are flat over an exceptionally wide frequency range, and each of these networks is surrounded with a feedback loop. This leads to unmeasurable distortion and phase shift throughout the entire audible range. The passive networks provide precise equalization and minimum phase shift, and are constructed of close-tolerance components.

Professional-type tone controls are incorporated because of their numerous inherent advantages. Step controls do not offer the limitations of continuously variable potentiometers, and each position can be designed to perform a specific function absolutely repeatable whenever necessary. Bass and treble boosts when used in different step positions are designed to electrically compensate for the various inadequacies of speakers, room acoustics, and variations in program material.

Most tone control circuits have the distinct disadvantage of not providing the user with a setting for absolutely flat, uncompensated response. If such a setting can be found by the use of instruments, the likelihood will be that it will not correlate to the perpendicular or 12 o'clock position, where the point of reference is usually designated, nor will the controls ever be completely out of the circuit to eliminate phase shift and transient distortion. With high quality components comprising the remainder of the stereo system and with the use of well-recorded program material, the user may well wish to maintain a perfectly flat response. The circuit used in this preamplifier based upon the professional step arrangement, provides perfectly flat positions for bass and treble which completely bypass all tone control circuitry, thereby limiting transient distortion and phase shift for unexcelled clean response.

Each bass and treble switching position has a carefully computed hinge point for its respective boost level. Each bass cut position is contoured to equalize for different speakers and for cabinet resonances. This enables the user to eliminate speaker hangover without upsetting the remainder of the frequency curve. The treble cut control reduces the high frequencies at a sharp slope, thereby eliminating the need for a separate sharp high frequency cut-off filter, required in ordinary preamplifiers. The slope of each treble cut curve has been optimized to give the sharpest cut-off without ringing. These step tone controls offer exceptional versatility and once calibrated for specific conditions may be reset with identical results.

The Citation I Stereo Preamplifier Control Center has been designed for many years of trouble-free listening pleasure, and will satisfy the aspirations of those who insist on nothing short of perfection itself.

## UNPACKING

After unpacking the Citation I, inspect it carefully for signs of transit damage. If damage is visible, notify your dealer at once. If the unit was shipped to you, notify the transportation company without delay. Please note that only the recipient can recover from the carrier for damages incurred during shipping.

## INSTALLATION PROCEDURE

### Ventilation

The Citation I is well ventilated in itself, but sufficient space must be allowed around it to permit proper air flow. Install it in a manner to allow for unrestricted circulation. Do not cut off the air supply by putting books or other objects on or against it. Do not place the Citation I directly above the power amplifier.

## **Installation**

The Citation I may be easily installed in your cabinet by following the simple instructions on the mounting template supplied. Alternatively, a furniture-finished hardwood enclosure is available from your dealer as an optional extra.

### **Power Amplifier Connection**

The Citation I Preamplifier was specifically designed for operation with the Citation II Stereo Power Amplifier. However, it is eminently suited to driving any other stereo power amplifier, or a pair of monophonic power amplifiers. If two monophonic amplifiers are used, it is strongly suggested that they be a matched pair.

Two pairs of preamplifier output receptacles are provided. These can be used to drive two entirely separate stereo power amplifiers in different locations. Shielded leads with standard plugs are used for making the connections. These can be obtained from your dealer in the lengths required. Because the Citation I uses low-impedance anode followers at the outputs, the power amplifier may be placed in any location up to forty feet from the Citation I.

When using the Citation II Power Amplifier, connect from the Citation I CHANNEL A OUTPUT receptacle (either one) to the Citation II CHANNEL A INPUT. Then connect a second shielded lead from either of the Citation I CHANNEL B OUTPUT receptacles to the Citation II CHANNEL B INPUT. The remaining pair of Citation I output receptacles, A and B, can be used to drive a second stereo amplifier. If you are using a pair of monophonic amplifiers with the Citation I, connect one of the preamplifier CHANNEL A outputs and one of the CHANNEL B outputs to the inputs of these amplifiers.

If "center fill" is required in your stereo system, a monophonic amplifier can be added. Simply connect a shielded lead from the Citation I receptacle marked CENTER CHANNEL AMP OUT to the input of the third-channel amplifier. This channel can also be used to provide remote monophonic operation.

Follow the instructions provided with your amplifier to connect your speakers. Do not turn on the equipment until you have made these connections.

### **Tape Head Playback Connection**

Connect a pair of shielded leads from your stereo tape deck to the A and B TAPE HD input receptacles on the INPUT CHANNEL strip at the rear of the Citation I. A monophonic tape deck can be connected to either of these inputs. If your tape player has its own preamplifier, do *not* use the TAPE HD inputs. The next paragraph describes this type of connection.

### **Tape Recorder Playback Connection**

Connect the outputs of your stereo tape recorder to the A and B TAPE AMP input receptacles on the INPUT CHANNEL strip at the rear of the Citation I. The output of a monophonic tape recorder can be connected to either the A or B TAPE AMP input.

### **Tape Recorder Recording Connection**

Provision is made on the Citation I to permit the recording of any program material. Connect the left input of your stereo tape recorder to the TAPE OUT receptacle A on the Citation I, and connect the right recorder input to TAPE OUT receptacle B. A monophonic recorder can be connected to either of the TAPE OUT receptacles. These connections should be kept as short as possible to avoid loss of treble response.

### **Tuner Connection**

Connect a pair of shielded leads from the AM and FM output receptacles of your stereo tuner to the Citation I TUNER Channel A and B receptacles. The FM lead is normally plugged into the Channel A tuner receptacle, the AM lead being connected to the Channel B receptacle. The same procedure applies if you are using separate AM and FM tuners.

If you are using a monophonic AM/FM tuner, connect it to the Channel A TUNER receptacle.

Multiplex is a form of FM stereo broadcasting where both channels are transmitted by one FM station. In addition to an FM tuner, a multiplex adaptor is necessary. For hookup information consult your adaptor instruction book.

### **Record Player Connection**

A stereo record player has two shielded output leads. If your record player uses a magnetic stereo cartridge, connect to the PHO 1 MAG receptacles, A and B, on the INPUT CHANNEL strip at the rear of the Citation I. If your record player uses a ceramic or crystal stereo cartridge, connect to the PHO 2 receptacles, A and B, marked CER-XTL on the INPUT CHANNEL strip. The additional pair of PHO 2 receptacles, A and B, marked MAG can be used for an additional record player with a magnetic stereo cartridge; however, only one pair of the PHO 2 receptacles can be used at a time. Thus, if you have two record players, one with a ceramic or a crystal cartridge and the other with a magnetic cartridge, the first would be connected to the PHO 2 input receptacles and the second to the PHO 1 receptacles. The choice between the two is then made by means of the FUNCTION switch on the front panel.

A monophonic cartridge of the magnetic type can be connected to either the A or B input receptacle of either PHO 1 MAG or PHO 2 MAG. Use either of the PHO 2 CER-XTL receptacles for a monophonic cartridge of the ceramic or crystal type.

### **Auxiliary Input Connections**

A pair of high-level input receptacles, marked AUX on the INPUT CHANNEL strip, is provided for connecting an additional program source. This is for use in more complicated systems where a second tape player, telephone line, or other input source is desired.

### **Power Connections**

Plug the AC cord into any outlet furnishing 105-125 volts 50 or 60 cycle AC current. Four AC convenience outlets are provided on the rear deck of the Citation I, one being live at all times and three live only when the power switch is on.

Plug the power cord of your Citation II (or other basic amplifier) into one of the switched outlets. Plug the power cord of your tuner or tape recorder into either of the other switched outlets. The heavy-duty Citation I power switch will then control the preamplifier and the associated equipment.

Plug the power cord of a turntable or record changer into the unswitched receptacle; these devices are best controlled by their own switches, in order to avoid the possibility of flats on idler wheels.

### **Ground Connections**

It may be desirable to provide a common ground between the Citation I preamplifier and any associated equipment. This can be accomplished by using the screw marked "ground" on the rear deck of the chassis.

## **WARRANTY**

This warranty applies only to Harman-Kardon factory-wired sets. For the warranty and service policy applicable to Citation kits, see the Kit Construction book.

For a period of 90 days following the original date of purchase, all parts supplied with Harman-Kardon Citation units are guaranteed by the manufacturer to be free from defects in material and workmanship when put to normal use and service. This guaranty is specifically limited to the following conditions:

- (1) To validate the warranty, the warranty card accompanying each unit must be filled out completely and returned to the factory immediately following the date of purchase.
- (2) Harman-Kardon reserves the right to substitute replacement parts for any which may be found defective.
- (3) The warranty is effective only as to parts which are defective at the time of sale or become defective as the result of normal operation during the 90 day period following the date of sale.
- (4) This warranty is limited to those parts which are returned to the factory transportation prepaid, and in the judgment of Harman-Kardon are found defective under the terms of this warranty.

This warranty is in lieu of all other warranties, express or implied and of all other obligations on the part of Harman-Kardon. Harman-Kardon neither assumes nor authorizes any one else to assume for it any other liability in connection with the sale of this instrument.

NOTE: It is necessary to receive factory authorization before returning a set for repair. Write directly to us describing the specific difficulty, model and serial number of your unit. At times, by performing certain checks on your own you can save the expense of shipping the set to a warranty station or to the factory.

We reserve the right to refuse a unit at our factory or warranty station unless previous authorization has been given.

## OPERATION

### Description of the Controls:

Each control in a well designed and honestly considered high fidelity instrument has a specific useful function. A brief explanatory note on the relationship of the various front panel controls will doubtless prove useful in organizing and clarifying them for you.

The Citation I Stereo Control Center front panel is clearly divided into four areas, each containing a group of functionally related controls.

The square gold colored area at the right contains the LOUDNESS, FUNCTION, MODE and BALANCE controls.

The upper rectangular gold area at the left contains the TURNOVER, ROLLOFF, BLEND and LOW-CUT (filter) controls.

The lower rectangular gold area contains a separate pair of BASS and TREBLE controls for each channel.

The center vertical brown area contains the illuminated POWER switch and the less frequently used TAPE MON., CONTOUR, PHASING and STEREO REV. switches.

### Power Switch:

The heavy duty rotary POWER switch controls the Citation I Preamplifier and all associated equipment, with the exception of the record player, which should be controlled by its own switch. The translucent POWER switch knob lights up when power is turned on.

### Loudness Control:

The LOUDNESS control adjusts the volume level of any program material fed into your stereo system. It is a dual control, simultaneously adjusting both channels. Its effect can be modified by the CONTOUR switch.

### Contour Switch:

One of the limitations of human hearing is its tendency to lose sensitivity to the very low pitched sounds, as the program sound level is reduced. It is this characteristic (known as the Fletcher-Munson effect) which causes one to play music programs at high listening level in order to experience the full rich tone available from fine modern recordings. The Harman-Kardon CONTOUR switch compensates for the Fletcher-Munson effect, thus eliminating high listening levels as a requisite for full enjoyment of reproduced music.

For low-level listening throw the CONTOUR switch either IN or OUT depending on your listening preference. You will note how the low frequencies become more apparent while the volume level remains unchanged when the CONTOUR switch is IN.

### Balance Control:

The nature of stereo reproduction is such that it requires two identical channels to attain the highest degree of faithfulness and spatial distribution. Any variation in the efficiency of one channel as compared to the other will disturb this relationship. Since there may be slight differences between the two speakers, the tape heads, etc., the Citation I includes a control to balance one channel against the other. Sufficient range is covered by this control to permit rebalancing of the overall system even in cases where major unbalance exists. This control may be set anywhere within its range to attain system balance. It does not necessarily have to be set in the exact vertical position.

When the BALANCE control is properly set, the apparent sound source will lie in a broad area between the two speakers. When the BALANCE control is rotated to the right the sound will move to the right and when the control is rotated to the left, the sound will move to the left.

### Mode Switch:

The MODE switch selects between stereo operation, where a stereo program source is available, and monophonic operation utilizing the full power of both channels and both speakers when the program source is monophonic only.

This switch has five positions. STEREO is the normal position for all stereo use of the system. BLEND is a second stereo position, which permits inclusion of the BLEND control in two-channel systems to eliminate "hole in the middle" effect.

The A & B position is used in a full stereo system when playing monophonic records or tape. MON A and MON B positions are used when the amplifiers and speakers are in full stereo connection, but the tuner or other input device is monophonic only and is connected to Channel A or Channel B inputs, respectively. Under these conditions, the combined power of both channels is utilized.

#### **Function Switch:**

The FUNCTION switch selects the desired type of program source and has six positions. It permits the choice of either of two record players or two tape players, a tuner, or any program source connected to the AUX (auxiliary) input receptacles. Since the switch acts on both channels simultaneously, it controls six pairs of inputs for stereo or twelve individual inputs for monophonic operation.

#### **Tone Controls:**

Individual BASS and TREBLE controls are provided for each channel to make it possible to balance the tone quality of one channel against the other. This, of course, is of major importance only if the two speakers, two program sources (AM & FM tuners for example) or room acoustics are unbalanced. For most stereo listening, however, the tone settings of both channels will be the same. A further application of the separate controls is in monophonic listening, to make it easy to switch from one monophonic source operating through Channel A to another operating through Channel B, having the tone settings previously adjusted.

Note that the tone controls are professional-type step switches. Each control has a zero position, where it is completely disconnected from the circuit, thereby eliminating any inherent transient distortion and phase shift. All other positions have a carefully computed hinge point, slope and contour, to provide specific benefits. Once the most satisfactory setting of these controls has been determined for any type of input, or for specific recordings, it is easy to return to that setting at any time.

#### **Turnover and Rolloff Switches:**

In order to assure good reproduction of the wide range of frequencies in music and to make necessary adjustments for the limitations of the recording technique, record manufacturers have found it necessary to modify the actual frequency response of the music while it is being recorded. Thus, to avoid overcutting and consequent distortion, a measured and deliberate reduction is effected in low frequency response by selecting a "turnover frequency" and by recording attenuated response below that point. To assure optimum signal-to-noise at the high frequency end when the record is played at home, the highs are deliberately exaggerated during the recording process. A measured and deliberate boost is effected above a certain frequency. This combination of deliberate exaggeration at the low and high ends of the frequency response can be expressed in a "recording curve". When the record is played a mirror image of that curve should be available so that the ideal "flat" response may be achieved. Since several different recording curves have been used in the past (differing with respect to the turnover points and the degree of emphasis or de-emphasis), a choice of playback curves is provided in the Citation I preamplifier.

For all stereophonic records set both switches in the RIAA position.

For all other recordings, the proper position may be determined by the marking on the record jacket, by reference to one of the high fidelity magazines, or by trial and error. In general, all old 78 RPM recordings will sound best with both switches set to the 78 position. Extremely worn or noisy discs may sound better with the ROLLOFF switch set to one of the more clockwise positions, however. Older American LP's may require the LP setting of both switches, while older European LP's may require the ROLLOFF switch set to LON (London).

Tape recordings will sound best in most cases with the two controls set in the extreme counterclockwise position, labeled TAPE and FLAT respectively, if the tape player has no preamplifier. If the tape player does have its own preamplifier, these controls will be inoperative, and the equalization is provided by the tape playback preamplifier.

**Low Cut Control:**

The LOW-CUT control has three positions. In the SUBSONIC position a filter is inserted into the circuit to remove all response below the audible range. This eliminates the possibility of speaker "breathing", a relatively slow movement of the speaker cone at great amplitude. Breathing is caused by such unmusical aberrations as eccentric records, passing trucks, etc. and results in intermodulation distortion and speaker damage.

The RUMBLE position filters out the very low bass frequencies, to eliminate unwanted elements such as turntable rumble and low frequency acoustic feedback.

The FLAT position is for the purist, with the finest of accessory equipment. All filters are removed, and the low frequency response is limited only by the power amplifier. (The Citation II basic amplifier has a low frequency cut off of 2 cycles.)

**Blend Control:**

In a two-channel stereo system, where the room acoustics or too-wide spacing of the speakers cause the sound to come from two sources rather than from one very broad source, a "hole in the middle" effect exists. By setting the MODE switch to the BLEND position, and then rotating the BLEND control, the two apparent sound sources will be electrically "moved together", eliminating the hole in the middle. The BLEND control should be turned up just enough to satisfy the listener—further increase will degrade the stereo effect by eliminating all separation. Alternately, and as a more professional approach, a third-channel monophonic amplifier and speaker may be installed, the third speaker to be located midway between the first two. (See installation section.) The BLEND control then controls the volume of the third speaker without affecting the other two, and may be adjusted to create the illusion of a wall of music. For this method, the MODE switch is set to the STEREO position.

**Phasing and Stereo Reverse Switches:**

These two switches have completely separate functions, but are very similarly applied. The PHASING switch reverses the phase or polarity of one channel. In connecting the speakers to the power amplifier, since an individual speaker has no polarity, it is possible to connect them so that on identical program material one will be pushing air when the other is pulling.

This, of course, is improper, and will cause a "hole in the middle" effect on both monophonic and stereo program material. It is easy to determine whether the speakers have been connected properly by listening to monophonic program material with the MODE switch set to A & B. Slide the PHASE switch back and forth. If the music sounds best and most evenly distributed with the PHASE switch in the REVerse position, the speakers are improperly connected. Reverse the two wires of ONE speaker to correct the condition. The system will then sound best with the switch in the NORmal position.

However, some stereo recordings or tapes are made with one channel reversed in phase. To correct this, slide the PHASE switch to the REVerse position.

Similarly, some stereo recordings are made with the channels interchanged, so that the percussion section of a symphony orchestra will appear to be at the left instead of the more usual right side. This condition is corrected by sliding the STEREO REVerse switch to the REVerse position.

**Tape Monitor Switch:**

Two TAPE OUTput receptacles are provided on the Citation I, to permit making tape recordings of any program being carried by the system. The signals appearing at these receptacles are unmodified by any of the controls, except for the TURNOVER and ROLLOFF switches, so that the tape recorder can provide its own proper equalization, while the main system is adjusted to the listener's taste. However, if the tape recorder is the professional type, with a third head for monitoring, it is possible to compare the recording with the original while it is being made. Simply slide the TAPE MONitor switch to the IN position to listen to the recording and back to the OUT position to listen to the original.

### To Play a Record or a Tape:

1. If you are operating the Citation I for the first time, or if there is no specific reason for any other setting, set the following controls at their neutral positions:

BLEND — Most counterclockwise position  
TONE CONTROLS (4) — Zero  
TAPE MONITOR — OUT  
CONTOUR — OUT  
PHASING — NORmal  
STEREO REVERSE — NORmal  
BALANCE — 12 o'clock position  
LOW-CUT — SUBSONIC.

2. Now turn the POWER switch on and allow a minute or so for the system to warm up.
3. Select the appropriate position on the FUNCTION switch.
4. Set the MODE switch at STEREO if it is a stereo recording and the turntable or tape deck is stereo-equipped. Set the MODE switch at A & B if it is a monophonic recording being played on a stereo mechanism. Set the MODE switch at MONophonic A or MONophonic B to play a monophonic recording on a monophonic-equipped mechanism.
5. Set the TURNOVER and ROLLOFF switches to TAPE and FLAT respectively if the program source is tape. Set them both to RIAA for a stereo recording, or otherwise as indicated in the previous description of these controls.
6. Start the tape or record playing mechanism, and adjust the LOUDNESS control to the desired volume. All further adjustments are refinements.
7. Adjust the BALANCE control in either direction, to center the apparent sound source between the speakers.
8. Adjust the two TREBLE controls and the two BASS controls in either direction, to attain most pleasing tone balance.
9. For special purposes, or to solve specific problems, the BLEND, CONTOUR, LOW-CUT, PHASING and STEREO REVERSE controls may now be operated. See the descriptions of these controls for proper application.

### To Listen to Monophonic AM or FM Broadcasts:

1. If you are operating the Citation I for the first time, or if there is no specific reason for any other setting, turn the following controls to their neutral positions:

TURNOVER — Any)  
ROLLOFF — Any) — These controls are out of the circuit in this application.  
BLEND — Most counterclockwise position  
LOW CUT — SUBSONIC  
TONE CONTROLS (4) — Zero  
TAPE MONITOR — OUT  
CONTOUR — OUT  
PHASING — NORmal  
STEREO REVERSE — NORmal  
BALANCE — 12 o'clock position.

2. Now turn the POWER switch on and allow a minute or so for the system to warm up.
3. Select the TUNER position on the FUNCTION switch.
4. Set the MODE switch at MONophonic A or MONophonic B, depending on which channel the tuner was connected to.
5. Operate the tuner in accordance with the manufacturer's instructions. Tune in the desired program.

6. Adjust the LOUDNESS control to the desired volume. All further adjustments are refinements.
7. Adjust the BALANCE control in either direction, to center the apparent sound source between the speakers.
8. Adjust the two TREBLE controls and the two BASS controls in either direction, to attain the most pleasing tonal balance.
9. To operate at low volume while retaining the warmth and fullness apparent at high volume, set the CONTOUR switch at IN.

**To Listen To Stereo Broadcasts:**

1. If you are operating the Citation I for the first time, or if there is no specific reason for any other setting, set the following controls at their neutral positions.

TURNOVER — Any)  
ROLLOFF — Any) — These controls are out of the circuit in this application.

BLEND — Most counterclockwise position.

LOWCUT — SUBSONIC

TONE CONTROLS (4) — Zero

TAPE MONITOR — OUT

CONTOUR — OUT

PHASING — NORmal

STEREO REVERSE — NORmal

BALANCE — 12 o'clock position.

2. Now turn the POWER switch on, and allow a minute or so for the system to warm up.
3. Select the TUNER position on the FUNCTION switch.
4. Set the MODE switch at STEREO.
5. Operate the tuner in accordance with the manufacturer's instructions. Tune in the desired stereo program on both FM and AM or on FM with multiplex. Note: It may be easier to tune in the program if it is tuned one channel at a time. Turn the BALANCE control completely counterclockwise for Channel A only in the left speaker, or clockwise for Channel B in the right speaker.
6. Adjust the BALANCE control to center the apparent sound source between the speakers.
7. Adjust the LOUDNESS control to the desired volume. All further adjustments are refinements.
8. Adjust the two TREBLE controls and the two BASS controls in either direction, to attain the most pleasing tonal balance.
9. For special purposes, or to solve specific problems, the BLEND, CONTOUR, LOW-CUT, PHASING and STEREO REVERSE controls may now be operated. See the descriptions of these controls for proper application.

**GENERAL OPERATING NOTES**

The many operating controls of the Citation I may at first seem elaborate and complicated. However, each is essential for some specific function, and a little practice and study of these instructions will soon familiarize you with their proper application. Don't be afraid to experiment—as long as the LOUDNESS control is at a reasonably low setting to avoid overloading the speakers or breaking your lease, no damage can be done.

When you have found the most pleasing positions for the tone controls, write them down. Mark your record jackets with the best TURNOVER and ROLLOFF settings.

7. Allow sufficient time for the 16 ohm, 20 watt load resistor to cool and disconnect from Channel A speaker terminal. Connect the load resistor to Channel B speaker terminals between ground (G) and 16 ohms.
8. Connect the phono patch cord into Channel B input jack (the upper jack) and adjust the Channel B A.C. Balance control located on the top of the chassis between the two KT88 output tubes (V7 and V8) with your screwdriver. Rotate the control as before, either to the right or to the left until the meter pointer aligns with the "BALANCE" mark.
9. Remove the phono patch cord and the 16 ohm, 20 watt resistor and set aside for use later on.
10. This completes the A.C. balance adjustment. Throw the meter selector switch to "OFF". (The meter should not be allowed to operate for an extended period of time while playing the amplifier for this may result in damage to the meter movement.)
11. After about  $\frac{1}{2}$  hour of bench or playing time, repeat this adjustment to insure minimum distortion. No further adjustments are necessary unless any of the tubes are replaced.

#### REPLACEMENT PARTS LIST

When ordering replacement parts be sure to specify the part number listed below.

Part Number	Description	Price
FT3273670	Power Transformer	39.35
FT3273671	Output Transformer	45.00
FC3273672	Choke	6.05
B3273674	Terminal Board, Channel A	4.65
B3273923	Terminal Board, Channel B	4.65
ZCOM3715	Fuse, 8 Amps—GLH	.25
M3274124	Meter	10.60
ER3273909	Meter Switch	1.80
RV3274149	Twin Pot	1.35
RV3274125	AC Balance Pot (single pot)	1.10
Z3273690	Selenium Rectifier	1.40
ZCOM3679	Silicon Diode (SD94A)	4.75
JE3273784	4 mfd/450 volts (Minimite)	1.00
JE3273681	40 mfd/525 volts	2.50
JE3273682	200mfd/250 volts	2.85
JE3273851	200mfd/250 volts (with insulating sleeve)	2.75
JE3273783	20-20 mfd/150 volts (with insulating sleeve)	1.50
JE3273683	50-50 mfd/450 volts	3.50
RWCOM3959	16 ohm W Wirewound	.40

## REPLACEABLE PARTS LIST

Part Number	Description	Price
FT3283735	Power Transformer	15.00
FC3283956	Choke	2.40
B3284130	Terminal Board	8.25
B3284132	Terminal Board	8.25
STCOM3823	Fuse Block (Diode Mtg.)	.95
RV3283745	Loudness Control	2.55
ER3284122	Function Switch	4.80
ER3284119	Mode Switch	2.70
ER3284118	Roll Off Switch	2.95
ER3284117	Turnover Switch	3.50
ER3283709	Bass Switch	2.85
ER3283710	Treble Switch	2.60
RV3283746	Blend Control	2.00
RV3284133	Balance Control	2.35
ER3283764	Power Switch	3.00
ESCOM3902	Slide Switch	.40
ER3283938	Rumble Switch	2.75
ZCOM3006	Fuse	.25
JE3283785	1500 Mfd/35V Electrolytic	4.25
JE3283786	40-40-40/450V Electrolytic	3.80
JE3284144	80/250V, 40/450V Electrolytic	3.05
JE3283788	80/250V Electrolytic	1.90
ZCOM3566	Silicon Rectifier	2.50
Z3284115	Silicon Rectifier	2.50

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