



CAD-75I

OPERATING MANUAL

NOTE: Before installing your new CAD-75I, please read this manual carefully. This manual will inform you of the CAD-75I specifications, proper installation procedures. Also included in this manual are guidelines on how to properly service and care for your new CAD-75I.

CAD-75-I
INTEGRATED STEREO AMPLIFIER

Congratulations! You have purchased one of the most exotic integrated stereo audio amplifiers available. The CAD-75-I integrated stereo amplifier redefines the characteristics and operating parameters of a true "high-end" amplifier. Careful design, parts selection and proper circuit topologies contribute to incredible reliability and enjoyment.

For the technically minded, a review of the circuit is in order. Your new CAD-75-I operates in a class AB mode utilizing regulated fixed bias on the 6550 output tubes. The 6550 output tubes are operating in a push-pull configuration utilizing the simple but effective system of a tapped-screen "ultra-linear" circuit. The ultra-linear circuit combines the advantages of triodes and pentodes, thus providing greater sensitivity, extremely low distortion and improved transient response. The output transformer in your CAD-75-I is the most important component in the amplifier and has been specifically designed by Cary Audio for use in the CAD-75-I. Negative feedback is used to reduce the noise floor and improve the speaker damping characteristics. Only 3 dB of feedback is utilized since the output transformer and circuit design was originally designed without feedback. The phase inverter is a 12AU7 cathode-coupled design utilizing negative cathode bias voltage. The preamplifier section of the CAD-75-I is a current source single-ended 12AX7 in direct coupled mode. The power supply features a 150% duty cycle EI laminate power transformer. The high voltage section features full wave rectification (not cheap voltage doublers used in many amplifiers) to a PI-L capacitive network. The full wave rectification is provided by two 5U4/CV378 rectifier tubes. The use of tube rectification is an assurance of slow B+ turn on during tube warm-up. To avoid AC hum, the input and phase inverter tubes have 12 VDC regulated filament voltage. This will prevent AC ripple voltage from capacitively being coupled to electrodes in the gain stage of the 12AX7 and 12AU7. The input signal from the volume control is direct coupled (DC) to the first grid of the 12AX7. There are no coupling capacitors in line with the input signal on the CAD-75-I. A block diagram of your new CAD-75-I has been provided in this manual for your reference.

A great deal of attention during design of your new CAD-75-I was concentrated on the "overload recovery" ability of the amplifier. The ability of an amplifier to instantly recover from clipping is much more important than is commonly believed. In the power war of amplifier manufacturers the mentality is focused on high and then even higher power output to solve the clipping problem. When in reality the most critical aspect is how fast of a recovery an amplifier can achieve after overload. With the incredible dynamic range of live and in turn recorded music, even 2,000 watts of power is not enough. Most of the music being listened to in an average

listening room is only requiring about 3 watts of power. It is on the transients of loud low frequency program material that tremendous signal voltages will appear at the input of the amplifier. It is in this situation that the overload recovery ability of an amplifier is of critical concern. The CAD-75-I extols its merits in the ability to handle transients and instantaneously recover from brief or even extended overloads. The CAD-75-I will overload symmetrically at any frequency in the audio bandpass. The CAD-75-I will also yield faithful reproduction of extremely low frequencies at full output levels. Power transformer, power supply regulation and output transformer design and careful shaping of the overall frequency response curve all play a very important part in the ability of the CAD-75-I to recover quickly when overloaded. If one were to monitor the high voltage rail voltage (430 VDC) of a CAD-75-I during soft and also loud music passages it will be found there is no more than a volt or so change from soft to loud passages.

Another technical feature of your new CAD-75-I amplifier is stability. The CAD-75-I may be operated with no load (without speaker) without damage to the amplifier, output transformer or tubes.

The most exciting feature of the CAD-75-I, aside from how compact and gorgeous it looks, is the delightful, sensual beauty of the music it recreates. The first thing that will strike you about your new CAD-75-I integrated amplifier is the incredible transparency and resolution of detail in the music. The CAD-75-I's sensual nature is best revealed in the sense of life it displays in female vocalists.

Your new CAD-75-I integrated amplifier presents music with such presence and directness, you'll be drawn into the music hour after musically satisfying hour. This is the result of circuit techniques, which eliminate any discernable crossover notch at low levels, and also contributes to the freedom from listening fatigue. The CAD-75-I will draw you in even further as you realize how lucid and utterly uncolored neutrality reveals delicate nuances in the sound stage.

Please read this complete manual for a complete understanding of trouble-free operation, and ENJOY THE MUSIC!

SPECIFICATIONS

Operating the CAD-75-I stereo integrated amplifier is a simple procedure, since each unit is designed for long term stability in virtually any home operating situation. Therefore, if the unit is operated outside the parameters outlined in this owner's manual, damage may result. Please read this manual carefully before putting your new Cary Audio Design CAD-75-I in operation.

The following definitions are applicable to this manual. These definitions must be followed explicitly.

WARNING
HAZARD PRESENTS PERSONAL INJURY OR DEATH

Caution
EQUIPMENT DAMAGE MAY OCCUR BUT NOT PERSONAL INJURY

Note
Proper performance of the amplifier cannot be ensured
if disregarded

1.2 Specifications

The following section describes the CAD-75-I basic specifications. Specs are subject to change without notice or obligation.

DIMENSIONS: 7"H x 18"W x 13"D

WEIGHT: 44 lbs.

CIRCUIT TYPE: Push-Pull Ultralinear Amplification in Class AB

POWER OUTPUT: 1KHz sign wave
17 volts RMS across 4 ohms = 72 watts
24.5 volts RMS across 8 ohms = 75 watts

INPUT SENSITIVITY: .250 volts for full output

INPUT IMPEDANCE: 100,000 ohms

NOISE AND HUM: 80dB below rated output

FREQUENCY RESPONSE (at full power output):
20Hz to 30,000Hz + 0 - 0.75dB

DAMPING FACTOR: Greater than 35

TUBES: 2-12AX7 pre-driver preamplifier
2-12AU7 phase inverter
4-6550 push-pull output circuit
2-5U4/CV378 rectifier

TRANSFORMERS: 1-EI laminated core power transformer
2-EI laminated core output transformers
150% duty cycle on all transformers

RESISTORS: 1% metal film

CAPACITORS: Polystyrene and polypropylene

POWER SUPPLY CAPACITORS: Four 1200 MFD @ 450VDC
Total 2400 MFD - 238 joules

AC CORD: 3 conductor shielded detachable

AC POWER REQUIREMENTS: 117 volts AC 50/60Hz
295 watts operate
90 watts in stand-by
234 volts AC 50/60Hz
295 watts operate
90 watts in stand-by

WARM-UP TIME: 3 minutes

BREAK-IN PERIOD: 100 hours of music playing time

FINISH: Black baked on epoxy paint over steel chassis

FRONT PANEL: Machined, anodized aluminum

1.3 Front Panel Features

AC-ON-STAND BY, OPERATE: Rotary switch turns on AC mains and high voltage on "in operate" position

LED: Indicates AC power on

EARPHONE: 3 conductor stereo headphone jack for low impedance earphones

OUTPUT SELECTOR: Switches amplifier output from speakers to earphone listening

LISTENING LEVEL: Dual precision potentiometer controlling volume of both channels

LEVEL CONTROL L,R: To be used as a balance between left and right channel

INPUT SOURCE: Selection of line inputs for listening

MONITOR: A) Tape monitor for listening to a recording as it is being recorded
B) Mute position eliminates all input amplification - great feature for tone arm placement on record

1.4 Rear Apron Features

INPUTS: Signal input connection via shielded interconnect cable

TAPE OUT: Steady level output to recorder input

TAPE IN: Activated by front panel monitor switch

SPEAKER OUTPUT: The 5-way binding posts provide the output to the speaker system. Red = +, Black = -

GND: For "audio purists" this should be connected to an earth ground rod via the shortest lead possible - this is not essential for proper operation. The earth ground will help insure immunity to RF interference and AC ground loops.

CAUTION
EQUIPMENT DAMAGE MAY OCCUR WITH IMPROPER FUSES

AC FUSE: This is an overcurrent protection fuse for the CAD-75-I. Never replace with any other valve than 3 AMP SLOW BLOW! 250 VOLT! (1.5 AMP SLOW BLOW ON 220 VAC OPERATION)

AC: 3 conductor shielded power detachable cord to AC power mains

CAUTION
NEVER REMOVE/INSERT AC LINE CORD WHEN THE UNIT IS ON

LPP-1 ACCESSORY PLUG: Supplies voltage to LPP-1 phono amplifier

INSTALLATION

This section describes the unpacking and installation procedures for the CAD-75-I amplifier.

WARNING
MAKE NO ATTEMPT TO PUT THE CAD-75-I AMPLIFIER IN SERVICE
WITHOUT THE BOTTOM PLATE ATTACHED - CONTACT WITH VOLTAGE
IN THE CAD-75-I CAN BE FATAL!!!!!!

2.1 Unpacking

All shipping containers have been specifically designed to protect their contents and special care has been taken to prevent damage under normal shipping conditions. Mishandling should be evident upon

inspection of the shipping container. If damage is found after visual inspection, take care not to destroy the evidence. If necessary, document the damage with photographs and contact the transport carrier immediately.

Carefully remove your new CAD-75-I stereo integrated amplifier from its packing carton, and examine it closely for signs of shipping damage. It is recommended to save all original packing cartons to protect your amplifier from damage should you wish to store it or ship it for after-sales service.

2.2 Warranty Card

Fill out the enclosed warranty registration card and return to Cary Audio Design, Inc. within 10 days of original purchase. Keep your original sales slip with the packing cartons should you ever need it for reference. **Failure to register warranty will limit the warranty to one year.**

2.3 Amplifier Placement

In general, the location of your new CAD-75-I is not critical. Certain precautions must be taken to ensure optimum performance. Avoid extremely hot locations such as near radiators or other heating units. Keep the top of the CAD-75-I clear of books, paper or other equipment to protect against overheating!! **DO NOT place your CAD-75-I in a closed bookcase - overheating will damage the amplifier!**

2.4 Power Requirements

The CAD-75-I is designed to operate from house current mains. The design voltage is 117 VAC at 50/60Hz. (Foreign units 234 VAC at 50/60Hz).

2.5 Cables

The speaker cables from the output posts of the CAD-75-I to the speaker system can be any convenient length your set-up requires. Select speaker cables of sufficient size to preserve the outstanding performance capabilities of your CAD-75-I. Heavy gauge #16 wire is suitable for distances up to 10 feet; #12 for 25 feet. Most audio dealers will have proper speaker cable in stock for this purpose.

OPERATION

Signal input connection is made via the input jacks on the rear of the CAD-75-I located on the rear panel. The interconnect cables from the output of the CD player, tuner, etc. can be any convenient length your set-up requires. The choice of a high quality interconnect

cable is important. Once again, your audio dealer will have the proper cables in stock for this purpose.

3.1 Operation

Your new CAD-75-I is ready for operation after the speaker and inter-connect cables have been installed.

3.2 AC On Stand By Power Switch

Simply turn the rotary switch to the "stand by" position. The RED LED on the front panel will light. After 30 seconds turn the switch to "operate". Observe that all 10 tubes are lit (filaments).

3.3 Stand By Switch

This is a most convenient feature on the CAD-75-I amplifier. In the "operate" position, the amplifier is ready to operate. In the "stand by" position, only the tube filaments are operating. You may wish to leave your CAD-75-I amp turned on in the "stand by" mode 24 hours a day. When you wish to listen to music simply flip the stand by switch to the operate position. Under these conditions the CAD-75-I is always warmed up and ready for peak performance.

3.4 Break-In Period

The tubes, capacitors and output transformers take approximately 100 hours of music playing to fully settle in for peak performance. The CAD-75-I will seem sterile or thin sounding right out of the box. After the first couple of hours you will notice increased depth and tighter bass. This break-in period defies all engineering theory, but is true with most audio amplifiers.

<p style="text-align: center;">WARNING MAKE SURE AMPLIFIER IS UNPLUGGED FROM AC MAINS BEFORE SERVICING</p>
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SERVICE AND CARE

4.1 CAD-75-I Care and Cleaning

The chassis and front of the CAD-75-I may be cleaned with a soft rag and Windex or a similar window cleaner. The frequency of cleaning will be governed by how many hours the CAD-75-I is operated and by operating environment cleanliness. A spray cleaning using Armorall adds a beautiful luster to the front and top of the CAD-75-I.

4.2 Tube Replacement

If it becomes necessary to replace the tubes in the CAD-75-I amplifier, a matched quartet set of output tubes of the same brand should be used. A new tube kit is available from Cary Audio Design, Inc. You should get a few years or more from the output tubes with everyday usage and many, many years of use from the 12AX7 and 12AU7 input tubes.

4.3 CAD-75-I "TWEAKS"

If you are technically inclined with an electronic background and would like to elevate your new CAD-75-I to an even greater performance level, you may wish to include some of the following up-grade tweaks:

5751 INPUT TUBES: This high-mu twin triode is a premium rated vacuum tube that will offer you incredible detail and air in the music. This military, commercial tube is rated in terms of "shock, fatigue, low-frequency vibration" with a minimum of 2,000 heater turn on and off from cold start operations. The noise floor of the CAD-75-I is down an additional 8 dB using the 5751's as the input tubes.

**6189 PHASE
INVERTER TUBES:** The 6189 twin triode made by Sylvania is the perfect tube for lovers of the old tube sound of years ago. In the CAD-75-I this low noise, low hum tube will give a sound system all the warmth and mid-range bloom needed.

**EDDISON PRICE
SPEAKER POSTS:** One of the finest heavy duty 5-way binding post available. Pure copper with plenty of space for bi-wiring even the heaviest speaker posts. All one needs to add these marvelous post to the CAD-75-I is an adjustable wrench and a large soldering iron. The sonic merits include better bass extension and high frequency detail.

**OIL FILLED .22
COUPLING CAPS:** Very expensive and exotic up-grade. The closest one is able to get to the ideal of no resistance, no leakage and no inductance. Of course, in practice, all caps have some of the above deficiencies. The ideal capacitor is not possible, but these oil filled are the ideal cap for AC audio coupling from the phase-inverter to

the output tubes in your CAD-75-I. A word is in order about the stock coupling caps in the CAD-75-I. Cary Audio Design utilizes very high quality caps as a stock item in your CAD-75-I. They are 600 volt .22 polystyrene. The oil filled are far too expensive to use as a standard part in production and still offer such a reasonable price on the mighty CAD-75-I. With the .22 / 600 VDC oil filled caps installed in the CAD-75-I you will have a mid-range bloom as never before along with incredible bass definition. The highs will come through as if "liquid syrup" was filling the sound stage. This is the most important improvement one could make on a CAD-75-I. These caps must be soldered, so one must have the expertise to solder when upgrading with the oil filled coupling caps.

CARY "TIP TOES":

The hard rubber feet on your CAD-75-I can be unscrewed and replaced with the black anodized aluminum Cary Tip Toe feet for unbelievable isolation of the CAD-75-I. Vibrations from the music in the listening room can cause colorations on the audio amplifier and preamplifier. Utilizing these isolation feet will dramatically float the CAD-75-I. A very simple tweak to perform.

All of these fantastic upgrade CAD-75-I tweak parts are available from your Cary Audio Design dealer. For additional info on the art of tweaking your CAD-75-I please feel free to call the Cary Audio service department at (919)481-4494. ENJOY....

4.4 Factory Service

Careful consideration has been given to the design of your CAD-75-I amplifier to keep maintenance problems to a minimum. However, it is possible that some problems may arise which cannot be cured by tube substitution. At this point we suggest that you contact our Customer Service Department phone number (919)481-4494 to describe your problem in detail. DO NOT return the CAD-75-I to the factory without a return authorization number from the Customer Service Department. Cary Audio Design, Inc. will assume no responsibility if the transportation company refuses to pay a damage claim due to your improper packing or lack of insurance should the unit be lost in shipment.

WARNINGS

**MAKE NO ATTEMPT TO PUT THE CAD-75-I IN SERVICE OUTSIDE THE CABINET.
CONTACT WITH HIGH VOLTAGES FOUND IN THE UNIT CAN BE FATAL!!**

COMPLETELY REMOVE AC POWER PLUG FROM THE WALL AND ALLOW 30 MINUTES FOR THE HIGH VOLTAGE CAPACITORS TO DISCHARGE THROUGH BLEEDER RESISTORS BEFORE ATTEMPTING TO CHANGE TUBES OR CLEAN THE INSIDE OF THE AMPLIFIER.

CAUTIONS

NEVER REMOVE/INSERT AC PLUG WHEN THE UNIT IS ON OR THE AC POWER SWITCH IS IN THE ON POSITION.

OBSTRUCTION OF THE TOP PORTION OF THE CAD-75-I WILL RESULT IN TUBES OVERHEATING AND DAMAGE TO THE AMPLIFIER.

!!OBSERVE DIRECTIONS IN THIS MANUAL!!