

INSTRUCTION MANUAL

McINTOSH MODEL C-4 and C-4P

AUDIO COMPENSATORS

Serial No. 6600 and above

McINTOSH LABORATORY, INC.

2 Chambers St. Binghamton, N. Y.

U.S.A.

INSTRUCTION MANUAL
McINTOSH MODEL C-4 and C-4P
AUDIO COMPENSATORS

The McIntosh Audio Compensator is a complete control unit for professional or home entertainment systems. The Audio Compensator supplies the necessary gain and equalization for use with low level phonograph cartridges as well as the high output of radio tuners.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

| | |
|---------------------------------|---|
| Power Source | C-4: Any McIntosh power amplifier C-4P: Self-Powered |
| Output | Main: 2.5 volts with rated input Tape: 0.5 volts with rated input |
| Input Sensitivity and Impedance | Tape and Tuner: 0.5 V., 500 K. Mic: 5MV, 100K Phono 1: 5MV, 100K Phono 2: 5MV, variable 6.8K-52K |
| Frequency Response | See Graphs |
| Harmonic Distortion | Less than 0.3% at 2.5 volts output, 20-20,000 cycles |
| Hum and Noise Level | Tape and Tuner: Better than 80 db below output Mic and Phono: Less than 2 microvolts at input terminals (— 115dbm) |
| Size | C-4 and C-4P: 10 ¹ / ₈ " x 3 ⁹ / ₁₆ " x 7 ¹ / ₂ " Front Panel: 11" x 4 ¹ / ₄ " (Knobs project ³ / ₄ ") D8A: 6"x4 ⁷ / ₈ "x2 ¹ / ₄ " (Power supply section of C-8P) |
| Weight | C-4: 8 lbs. C-4P: 11 lbs., 6oz. |

FRONT PANEL CONTROLS

| CONTROL | INPUTS AFFECTED | PURPOSE |
|----------------------|--------------------|---|
| Selector | All | Select desired sound source. |
| Volume | All | Control sound level. |
| Bass and Treble Tone | All | Continuously variable control of low and high frequencies. |
| Compensation Switch | Phono | Provide frequency compensation for phonograph recordings or tape heads. |

**INSTALLATION OF MODEL C-4 and C-4P
AUDIO COMPENSATORS**

The C-4 or C-4P may be used in its own cabinet or may be easily mounted in any equipment cabinet by using the mounting templates supplied with this manual.

After these units have been secured in their desired location, proceed as follows:

1. Connect speaker to output of power amplifier.
2. Insert power amplifier line cord into one of the Auxiliary A. C. receptacles provided at the rear chassis of the Audio Compensator.
3. C-4: Connect inter-unit cable to socket labeled "PRE-AMP. INPUT" on McIntosh power amplifiers. Adjust gain control fully counterclockwise with MC-30 or MC-60. CAUTION: THE INTER-UNIT CABLE MUST NOT BE REMOVED FROM THE C-4.
C-4P: Insert cable of D-8A power supply into the octal socket on the C-4P. Connect audio cable provided between RETMA pin jack labeled "MAIN OUTPUT" on C-4P and 2.5V input of power amplifier. (Socket labeled "PRE-AMP INPUT" on McIntosh power amplifiers. Adjust gain control fully counterclockwise with MC-30 or MC-60.)
4. The Audio Compensator output is 2.5 volts with rated input signal and the power amplifier should be adjusted for this input sensitivity. However, any amplifier requiring less than 2.5 volts input may be used since the volume control on the Audio Compensator is located at the output. Reducing this control will not increase either the distortion or noise level.
5. Turn the volume control on the Audio Compensator to "OFF."
6. Insert power cord of the Audio Compensator into a 117 V.A.C. power outlet.
7. Turn the volume control on the Audio Compensator clockwise until the power switch is activated. Allow thirty seconds for warm-up, then advance the volume control to "10."
8. C-4: Adjust the hum reducing potentiometer on the power amplifier for minimum hum.
C-4P: Adjust the hum reducing potentiometer on the power supply for minimum hum.
This adjustment will occur at one end of rotation. The C-4 and C-4P have a D. C. supply for the tube heaters and minimum hum will be achieved when the correct side of this supply is grounded.
9. Turn the volume control on the Audio Compensator to off.
10. Insert inputs in their proper jacks at the back of the Audio Compensator, and all A.C. power cords into the A.C. outlets provided.

INPUT CONNECTING PROCEDURE

The inherent hum and noise voltages applied to the input of the Audio Compensator are —115 DBM, or less than 2 microvolts. To avoid lowering the signal to hum ratio of the Audio Compensator, by adding hum voltages to the input, extreme care must be taken in its installation. We offer the following recommendations as a guide to installation:

1. Connect inputs of Audio Compensator as outlined on the table below:

| CHANNEL | INPUT (FOR 2.5V OUTPUT) | GAIN | INPUT IMPEDANCE | USE |
|----------------|-------------------------|------|-------------------|---|
| TAPE AND TUNER | 0.5V | 15db | 500K | Radio or TV Tuners. Tape recorders with self-contained equalizers. |
| MIC | 5MV | 53db | 100K | Low impedance microphone in conjunction with an input transformer such as McIntosh M-107. |
| PHONO 1 | 5MV | 53db | 100K | Magnetic phonograph cartridges. Tape recorder without self-contained equalizers (tape heads). |
| PHONO 2 | 5MV | 53db | Variable 6.8K-52K | Magnetic or constant amplitude phonograph cartridges. Tape heads. |

2. The Audio Compensator and magnetic phonograph cartridges should be mounted at least two feet from power transformers.

3. Inter-unit cables provide a complete ground system. Alternate ground wires create ground loops which will usually increase hum level.

4. The 12AX7 tubes used in the Audio Compensator are heated with D.C. The hum adjust control on the power source for these units requires an initial adjustment to correctly balance the D.C. supply. Correct adjustment will occur at one end of rotation and will be evident by the absence of hum.

5. Grounding the turntable motor frame to the Audio Compensator chassis near the input jacks may reduce the hum level on the phonograph channels. Do not use the shield on lead from cartridge for this connection.

All channels of the Audio Compensator have an input level control which should be used to reduce signal input in excess of their rated value (see specifications). Proper adjustment of these controls will allow switching channels without a change in volume.

If the input signal voltage is unknown the level controls may be adjusted as follows:

1. Turn the level control off (fully counterclockwise).
2. Set the main volume control at "7."
3. Adjust the gain control for a reasonably loud listening level.
4. If a highly efficient speaker system is used, the level adjustment should be made with the volume control at "5."

Tape and Tuner Channels:

These channels each have an input impedance of 500,000 ohms and sensitivity of 0.5 volts. The flat frequency response of these channels may be modified by the Tone controls as desired.

Mic Channel:

This channel has an input impedance of 100,000 ohms and sensitivity of 5MV. It is intended to be used with a low impedance microphone in conjunction with a suitable input transformer. The flat frequency response of this channel may be modified by the Tone controls as desired.

Phono 1 Channel:

This channel has an input impedance of 100,000 ohms and sensitivity of 5MV. It is frequency compensated for use with magnetic phonograph cartridges or tape heads. This high input impedance is suitable for operation with the Audax phonograph cartridge, or the input impedance may be lowered by connecting a resistor across the input of the following values:

| Desired Impedance | Resistor Across Input |
|-------------------|-----------------------|
| 100K | None |
| 50K (47K) | 100K |
| 27K | 36K |
| 12K | 15K |

Phono 2 Channel:

This channel is the same as Phono 1, except that a variable load control has been provided which varies the input impedance from 6.8K to 52K. This control incorporates a switch which is activated in the extreme counterclockwise position. In this position the input is terminated for use with constant amplitude cartridges.

The following table lists recommended termination for several cartridges:

| CARTRIDGE | ADJUST LOAD CONTROL | CARTRIDGE | ADJUST LOAD CONTROL |
|---|------------------------|---------------------------------------|------------------------|
| Pickering (200 Series) | 27K | E.S.L. with input transformer | 47K |
| Pickering Fluxvalve | 47K | FM type cartridges—crystal or ceramic | CA (FM on some units) |
| G.E. variable reluctance | 47K | | |
| Fairchild (input transformer not necessary) | 47K | Audax—Use Phono 1 Channel | |

The signal from tape heads may be connected directly to one of the phono channels and the Audio Compensator used for equalization of the recorded tape. The Compensation switch should be set at position "800, 10" for tape equalization, and the tone controls may be used to vary the frequency response as desired.

OUTPUT CONNECTIONS

Three outputs are provided: one tape and two main outputs.

The Tape output may be used for recording tape from any source connected to the Audio Compensator. The Selector switch and Compensation switch are effective at this output. Adjustment of the Bass and Treble tone controls and Volume control may be made for monitoring and will not affect the recorded signal. The Tape output delivers a signal of 0.5 volts.

The Main outputs are available at the octal socket between pins #1 and #2 (pin #1 is ground), and at the RETMA pin jack labeled "MAIN OUTPUT." The inter-unit cable connecting the C-4 to any McIntosh power amplifier uses the octal socket output. The pin jack output may be used for driving a second power amplifier if so desired.

The Main and Tape output jacks are fed from cathode followers. The input impedance of devices connected to these outputs should be 50,000 ohms or greater, and the capacitive reactance of audio cables connecting these devices should not be less than 8,000 ohms at 20,000 cycles. This is the reactance of a capacity of 1000 mmf. Audio cable having a capacity of 25 mmf per foot may be 40 feet long, 13.5 mmf per foot cable may be 75 feet long.

VOLTAGE AND RESISTANCE CHART

Resistances measured to ground with pin #4 of inter-unit cable socket shorted to pin #1. D.C. voltages measured with VTVM to ground using D-8A power supply.

| V1 | | |
|---------|------------|--------|
| PIN NO. | D.C. VOLTS | RES. Ω |
| 1 | 96V | 300K |
| 2 | 0 | 0-100K |
| 3 | 1.07 | 4.3K |
| 4 | 0 | |
| 5 | 11.7 | |
| 6 | 94V | 400K |
| 7 | 0 | 1M |
| 8 | 1V | 1.8K |
| 9 | | |

| V2 | | |
|---------|------------|--------|
| PIN NO. | D.C. VOLTS | RES. Ω |
| 1 | 185V | 120K |
| 2 | 94V | 450K |
| 3 | 97V | 360K |
| 4 | 11.7 | |
| 5 | 0 | |
| 6 | 185 | 120K |
| 7 | 20 | 1.1M |
| 8 | 66 | 110K |
| 9 | | |

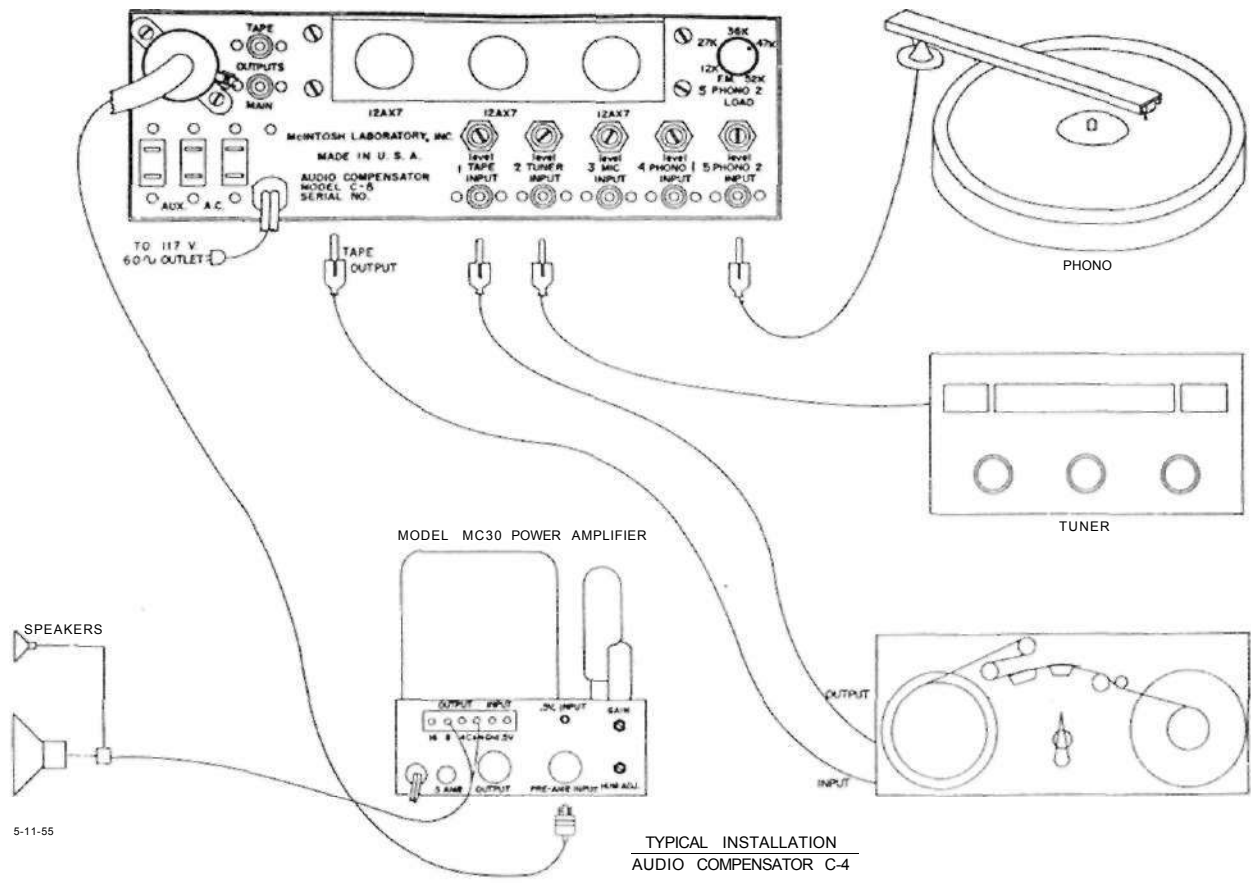
| V3 | | |
|---------|------------|--------|
| PIN NO. | D.C. VOLTS | RES. Ω |
| 1 | 110 | 370K |
| 2 | 0 | 105K |
| 3 | .82 | 1K |
| 4 | 0 | |
| 5 | 11.7 | |
| 6 | 340V | 10K |
| 7 | 34V | 1.1M |
| 8 | 118V | 105K |
| 9 | | |

GUARANTEE

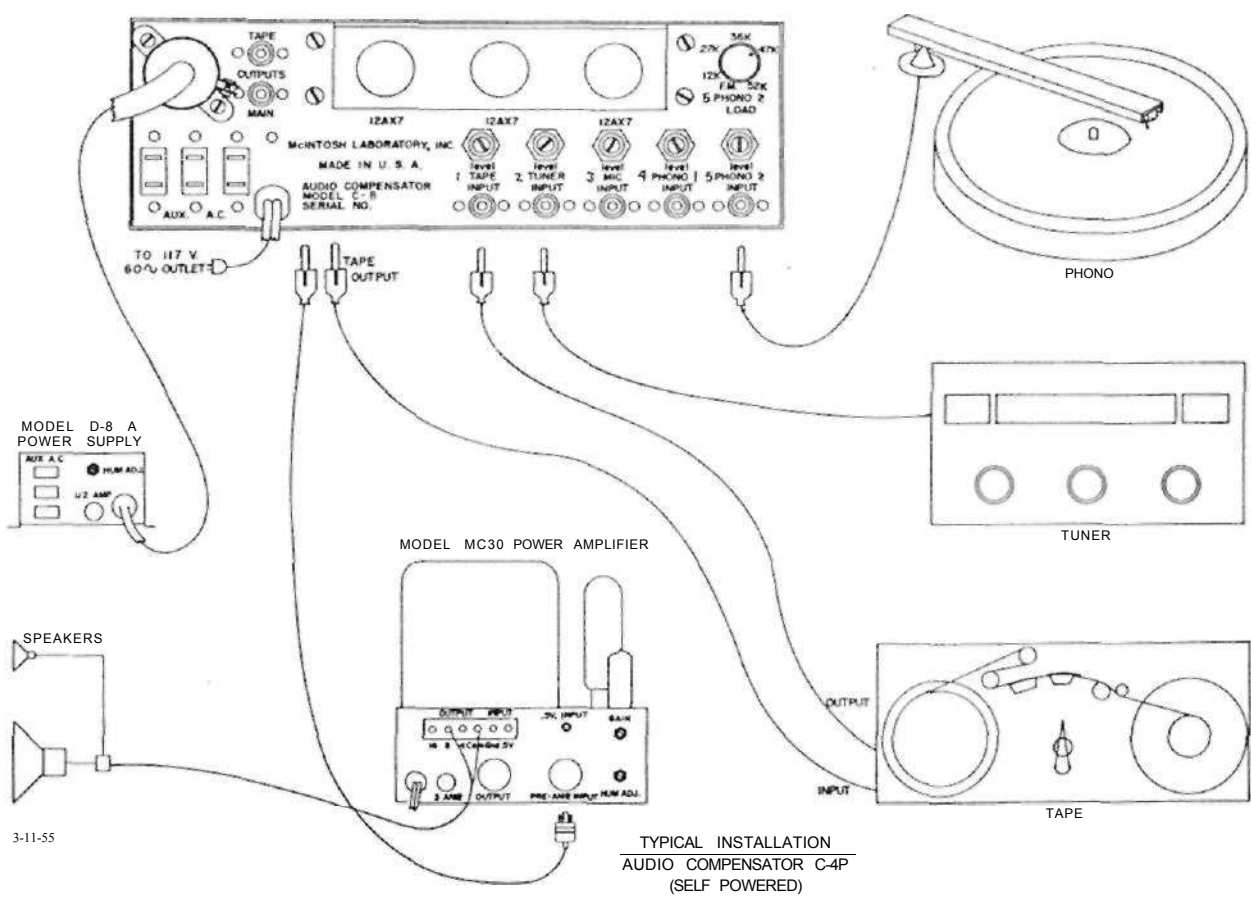
We guarantee the performance of this equipment and the mechanical and electrical workmanship to be free of serious defects for a period of 90 days. This guarantee does not extend to components damaged by improper use, nor does it extend to transportation to and from the factory.

McINTOSH LABORATORY, INC.
 2 Chambers St.
 Binghamton, N. Y., U.S.A.

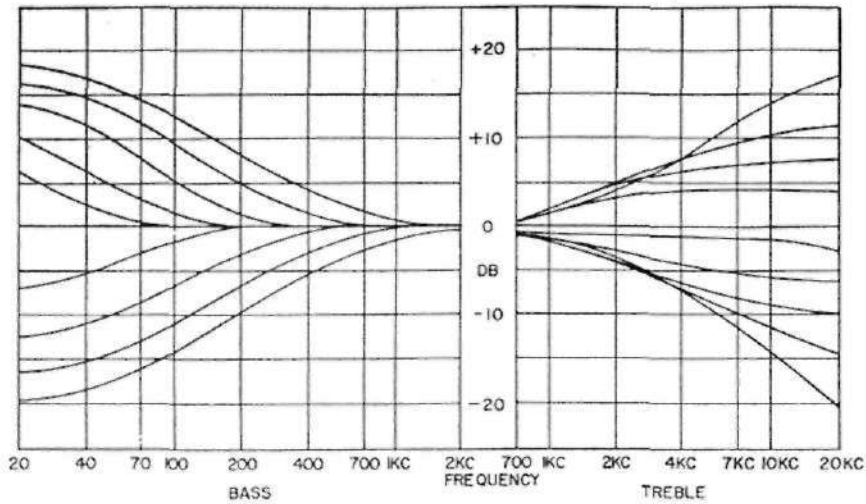
In Canada Manufactured Under License by
 McCURDY RADIO INDUSTRIES LIMITED
 22 Front Street, West Toronto, Canada



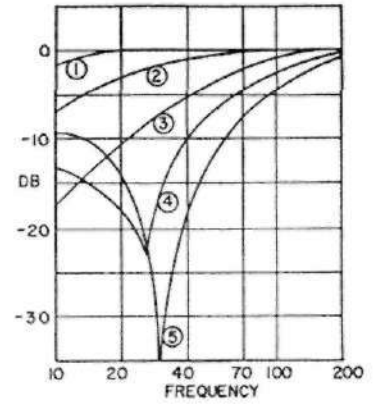
5-11-55



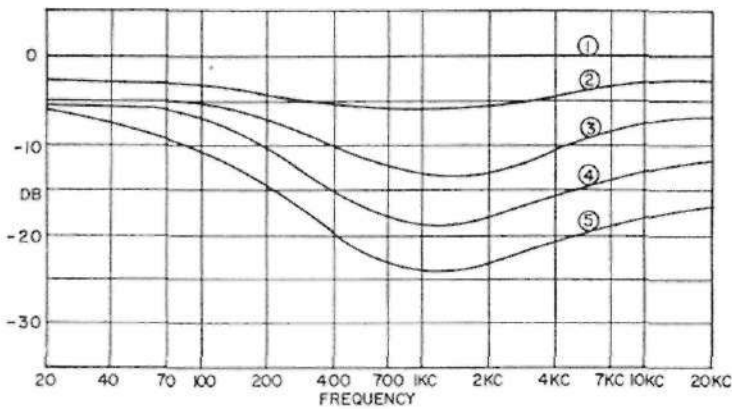
3-11-55



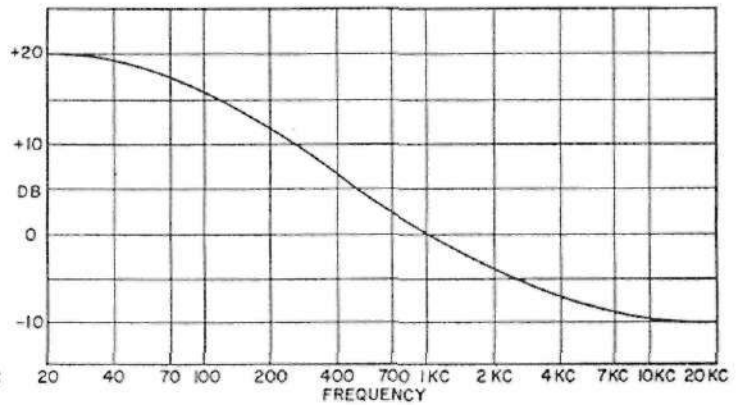
TONE CONTROLS
(ALL CHANNELS)



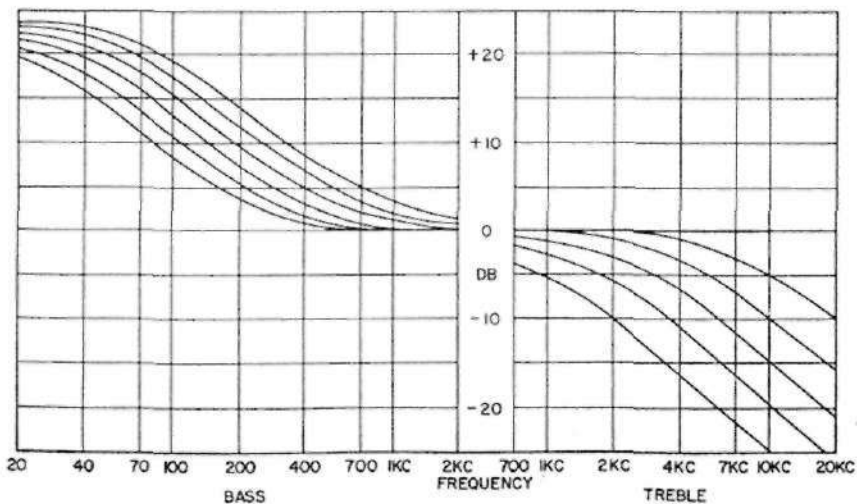
RUMBLE FILTER
(MIC & PHONO CHANNELS ONLY)



AURAL COMPENSATOR
(ALL CHANNELS)



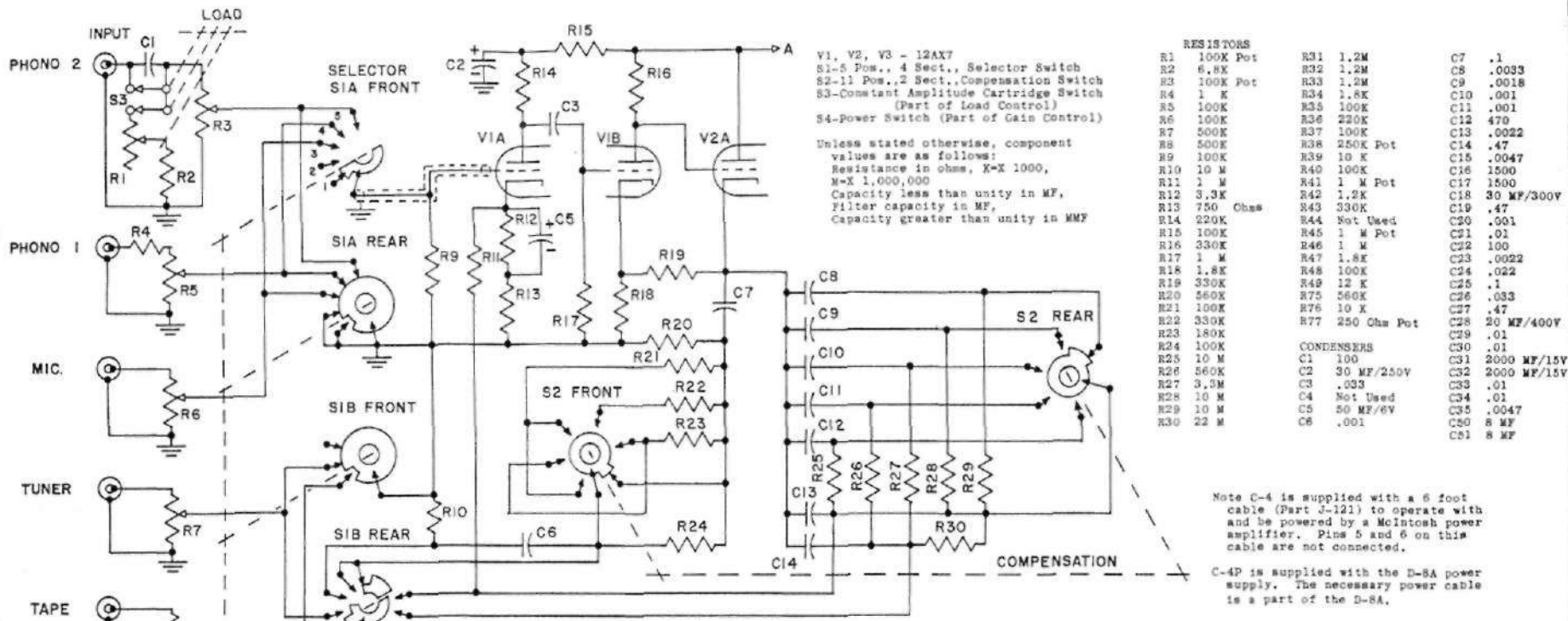
NARTB TAPE
PLAYBACK COMPENSATION
(PHONO CHANNELS ONLY)
BASS SWITCH "950" DEPRESSED
BASS TONE -1
TREBLE TONE -2.5



(PHONO CHANNELS ONLY) COMPENSATION CONTROLS (MIC & PHONO CHANNELS ONLY)

(CONTROL CURVES FOR MODEL C-8
AUDIO COMPENSATOR

McINTOSH LABORATORY, INC.



V1, V2, V3 - 12AX7
 S1-5 Pos., 4 Sect., Selector Switch
 S2-11 Pos., 2 Sect., Compensation Switch
 S3-Constant Amplitude Cartridge Switch
 (Part of Load Control)
 S4-Power Gain (Part of Gain Control)

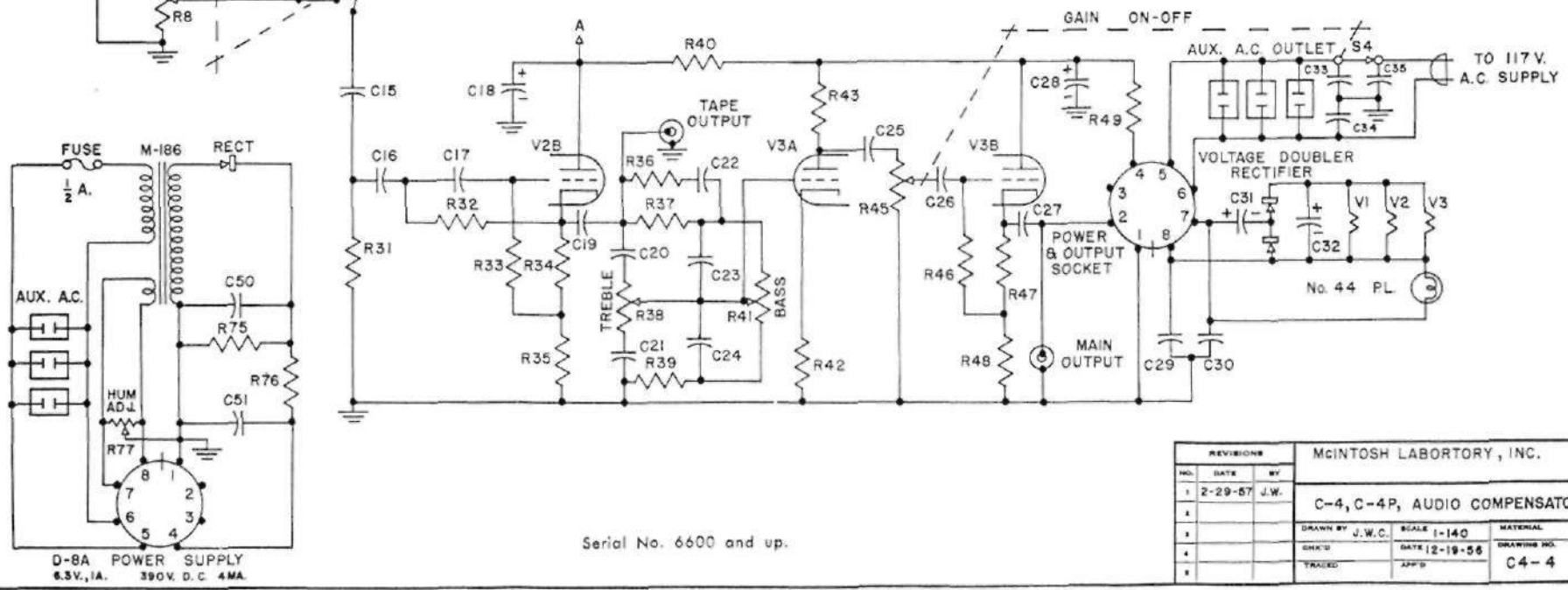
Unless stated otherwise, component values are as follows:
 Resistance in ohms, K=X 1000,
 M=X 1,000,000
 Capacity less than unity in MF,
 Filter capacity in MF,
 Capacity greater than unity in MMF

| RESISTORS | | |
|-----------|----------|-----------------|
| R1 | 100K Pot | R31 1.2M |
| R2 | 6.8K | R32 1.2M |
| R3 | 100K Pot | R33 1.2M |
| R4 | 1 K | R34 1.8K |
| R5 | 100K | R35 100K |
| R6 | 100K | R36 220K |
| R7 | 500K | R37 100K |
| R8 | 500K | R38 250K Pot |
| R9 | 100K | R39 10 K |
| R10 | 10 M | R40 100K |
| R11 | 1 M | R41 1 M Pot |
| R12 | 3.3K | R42 1.2K |
| R13 | 750 Ohms | R43 330K |
| R14 | 220K | R44 Not Used |
| R15 | 100K | R45 1 M Pot |
| R16 | 330K | R46 1 M |
| R17 | 1 M | R47 1.8K |
| R18 | 1.8K | R48 100K |
| R19 | 330K | R49 12 K |
| R20 | 560K | R75 560K |
| R21 | 100K | R76 10 K |
| R22 | 330K | R77 250 Ohm Pot |
| R23 | 180K | |
| R24 | 100K | |
| R25 | 10 M | |
| R26 | 560K | |
| R27 | 3.3M | |
| R28 | 10 M | |
| R29 | 10 M | |
| R30 | 22 M | |

| CONDENSERS | | |
|------------|------------|-----------------|
| C1 | 100 | C7 .1 |
| C2 | 30 MF/250V | C8 .0033 |
| C3 | 30 MF/250V | C9 .0018 |
| C4 | Not Used | C10 .001 |
| C5 | 50 MF/6V | C11 .001 |
| C6 | .001 | C12 470 |
| | | C13 .0022 |
| | | C14 .47 |
| | | C15 .0047 |
| | | C16 1500 |
| | | C17 1500 |
| | | C18 30 MF/300V |
| | | C19 .47 |
| | | C20 .001 |
| | | C21 .01 |
| | | C22 100 |
| | | C23 .0022 |
| | | C24 .022 |
| | | C25 .1 |
| | | C26 .033 |
| | | C27 .47 |
| | | C28 20 MF/400V |
| | | C29 .01 |
| | | C30 .01 |
| | | C31 2000 MF/15V |
| | | C32 2000 MF/15V |
| | | C33 .01 |
| | | C34 .01 |
| | | C35 .0047 |
| | | C36 8 MF |
| | | C37 8 MF |

Note C-4 is supplied with a 6 foot cable (Part J-121) to operate with and be powered by a McIntosh power amplifier. Pins 5 and 6 on this cable are not connected.

C-4P is supplied with the D-8A power supply. The necessary power cable is a part of the D-8A.



Serial No. 6600 and up.

| REVISIONS | | | McINTOSH LABORATORY, INC. | |
|------------------------------|---------|------|---------------------------|-------------|
| NO. | DATE | BY | SCALE | MATERIAL |
| 1 | 2-29-57 | J.W. | 1-140 | |
| C-4, C-4P, AUDIO COMPENSATOR | | | | |
| DRAWN BY J.W.C. | | | SCALE 1-140 | MATERIAL |
| CHK'D | | | DATE 12-19-56 | DRAWING NO. |
| TRACED | | | APP'D | C4-4 |

RECORD COMPENSATION

with the **McIntosh**

C-4 EQUALIZER PRE-AMPLIFIER

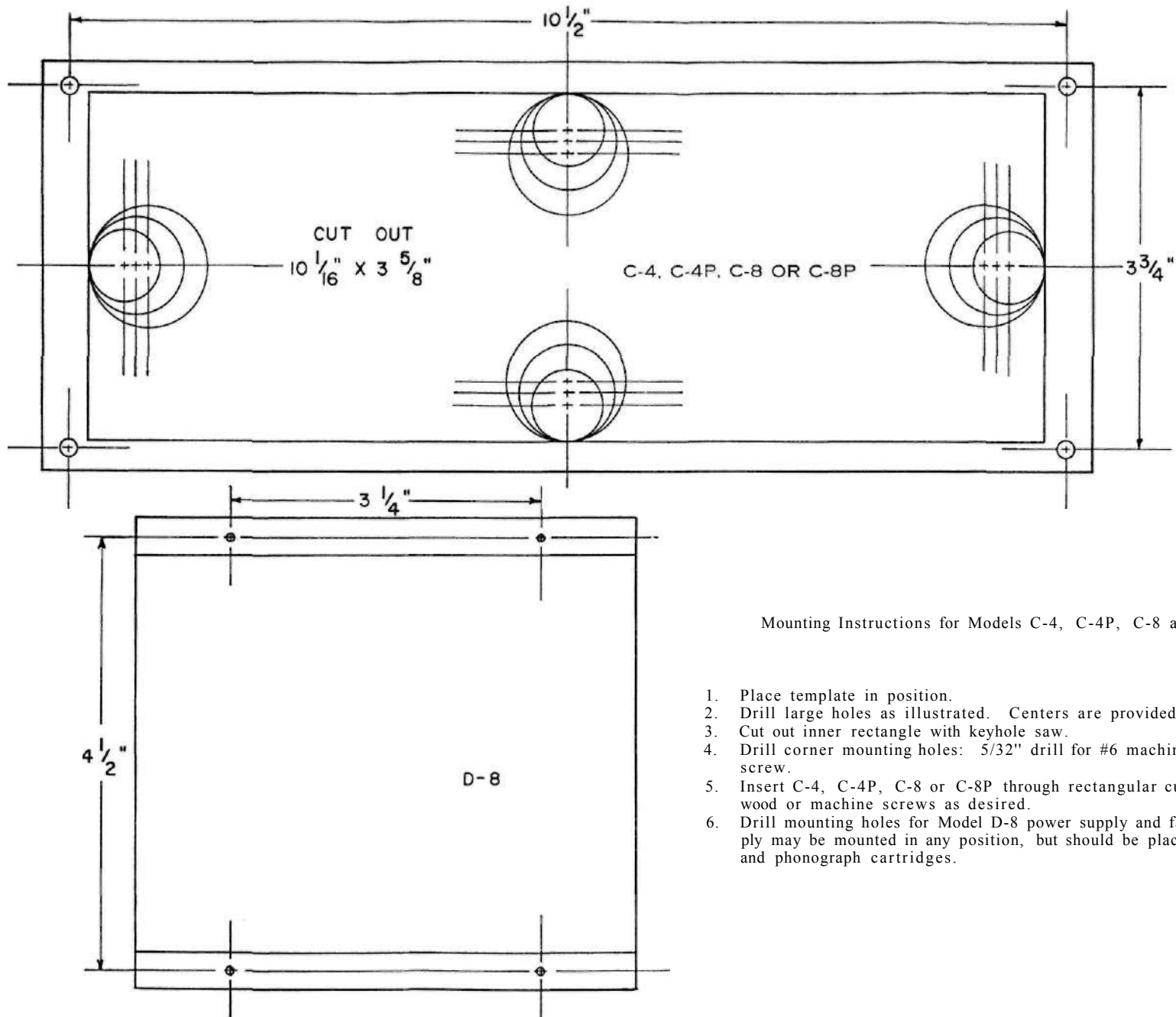


For Finest Listening . . .

The McIntOSH C-4 Equalizer can be set to compensate the recording characteristic used by the record manufacturer. Use the "Compensator" knob position indicated on this chart. Make further fine adjustment of tone with the "Bass" and "Treble" controls to suit your individual preference. (Turning to the left of 0 adds de-emphasis; turning to the right of 0 adds emphasis.)

| Manufacturer | Speed | Compensation | Manufacturer | Speed | Compensation |
|---|----------|--------------|--------------------------------|----------------------|--------------|
| ALLEGRO | 33 | COL, LP | COLUMBIA* | 45 | NAB |
| ALLIED | 33 | NAB | COLUMBIA* | 78 | COL, 78 |
| AMERICAN RECORDING SOCIETY* | 33 | AES | CONCERT HALL* CONTEMPORARY* | 33 | AES |
| ANGEL ARIZONA | 33 | ORTHO | CORAL | 33 | NAB |
| ATLANTIC* | 33 | NAB | COOK | 33 | ORTHO |
| AUDIOPHILE | 78 | ORTHO | DECCA* DIAL | 33 45 78 33 | COL, LP |
| BACH GUILD BANNER* | 33 | COL, LP | ELECTRA* | 33 | 629, 16 |
| BARTOK* BOSTON* | 33 | 629, 16 | EMS* | 33 | AES |
| BETHLEHEM | 33 | ORTHO | EPIC* | 33 | COL, LP |
| BLUE NOTE* | 33 | AES | ESOTERIC | 33 | ORTHO |
| CAEDMON* | 33 | 629, 11 | EUROPEAN | 78 | EUR, 78 |
| CAPITOL | 45 | ORTHO | FESTIVAL | 33 | COL, LP |
| CAPITOL* | 33 78 | AES | FOLKWAYS* | 33 | 629, 16 |
| CANYON* CAPITOL-CETRA* COLOSSEUM* | 33 | AES | GOOD TIME JAZZ | 33 | AES |
| CLASSIC EDITIONS | 33 | ORTHO | H.M.V. | 33 | ORTHO |
| CETRA-SORIA COLUMBIA* | 33 | COL, LP | HANDEL SOC. HAYDEN SOC. | 33 | COL, LP |

| Manufacturer | Speed | Compensation | Manufacturer | Speed | Compensation |
|-----------------------------------|----------------|--------------|---|----------------|--------------|
| KAPP | 33 | ORTHO | RACHMANINOFF SOCIETY | 33 | COL, LP |
| KENDALL | 33 | NAB | RCA VICTOR (OLD) | 33 45 78 | 800, 10 |
| LONDON* | 33 | LON, LP | RCA VICTOR (New RIAA Curve) | 33 45 78 | ORTHO |
| LONDON* | 78 | EUR, 78 | REMYNTON | 33 | NAB |
| LYRICHORD | 33 | NAB | RENAISSANCE | 33 | LON, LP |
| McINTOSH | 33 | ORTHO | SAVOY | 33 | ORTHO |
| MERCURY* | 33 45 78 | AES | STRADIVARI | 33 | COL, LP |
| MGM* | 33 45 78 | ORTHO | TECHNICORD | 78 | 800, 10 |
| MONTILLA* NEW JAZZ NOCTURNE | 33 | ORTHO | TELEFUNKEN | 78 | EUR, 78 |
| L'OISEAU-LYRE | 33 | ORTHO | TEMPO | 33 | NAB |
| NEW RECORDS OCEANIC OXFORD | 33 | COL, LP | TRANSRADIO | 33 | COL, LP |
| OVERTONE PACIFIC JAZZ | 33 | ORTHO | URANIA | 33 | ORTHO |
| PERIOD | 33 | NAB | VANGUARD VOX* WESTMINSTER | 33 | COL, LP |
| PHILHARMONIA | 33 | AES | WALDEN | 33 | ORTHO |
| POLYMUSIC | 33 | NAB | ♦ RIAA, ORTHO, New NARTB, New AES used on recording mode since 1955 | | ORTHO |
| PRESTIGE RIVERSIDE ROMANY | 33 | ORTHO | | | |



Mounting Instructions for Models C-4, C-4P, C-8 and C-8F Audio Compensators

1. Place template in position.
2. Drill large holes as illustrated. Centers are provided for 3/4", 1", and 1-1/4" drills.
3. Cut out inner rectangle with keyhole saw.
4. Drill corner mounting holes: 5/32" drill for #6 machine screw; 1/16" drill for #6 wood screw.
5. Insert C-4, C-4P, C-8 or C-8P through rectangular cut-out and fasten in position using wood or machine screws as desired.
6. Drill mounting holes for Model D-8 power supply and fasten in position. The power supply may be mounted in any position, but should be placed at least two feet from the unit and phonograph cartridges.