

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		

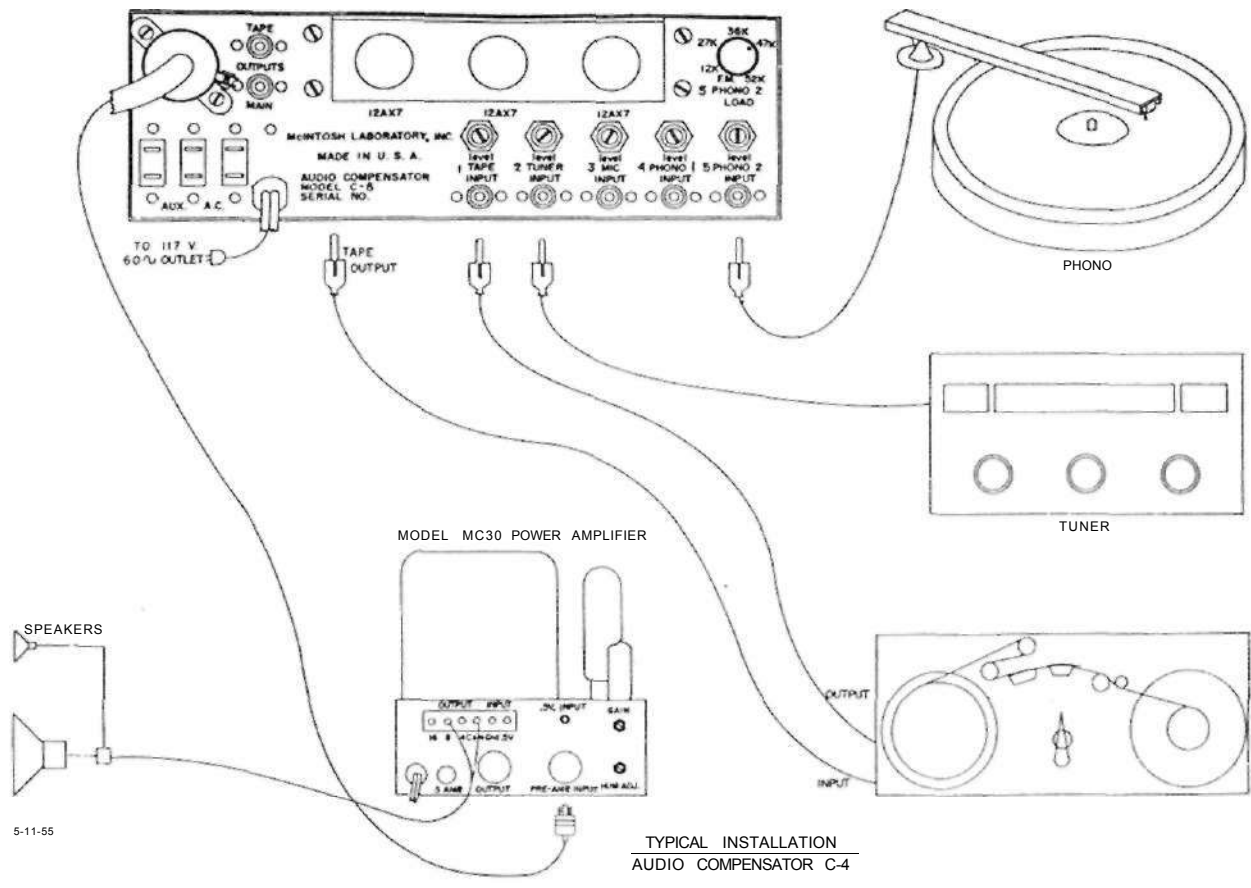
V3		
PIN NO.	D.C. VOLTS	RES. Ω
1	110	370K
2	0	105K
3	.82	1K
4	0	
5	11.7	
6	340V	10K
7	34V	1.1M
8	118V	105K
9		

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.

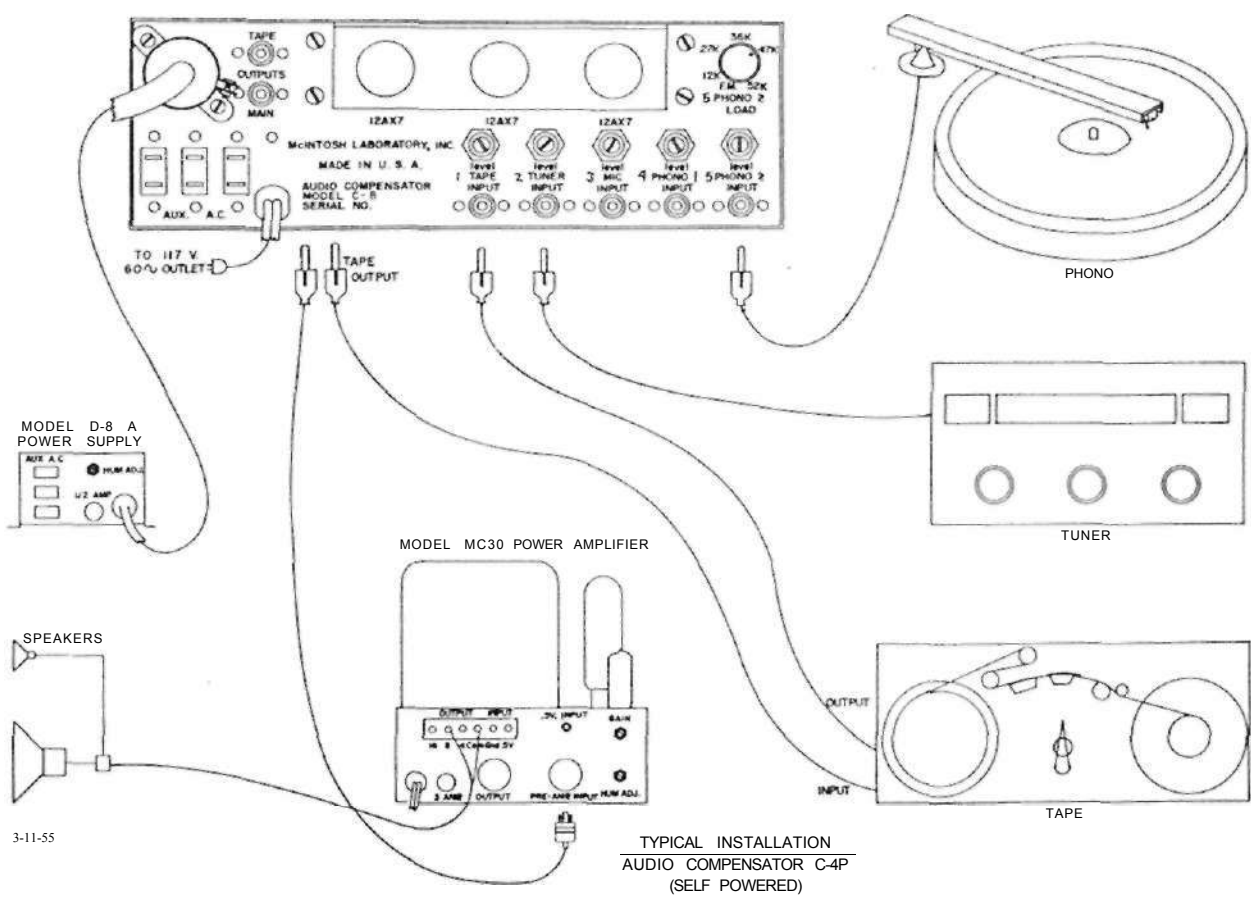
McINTOSH LABORATORY, INC.
2 Chambers St.
Binghamton, N. Y., U.S.A.

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



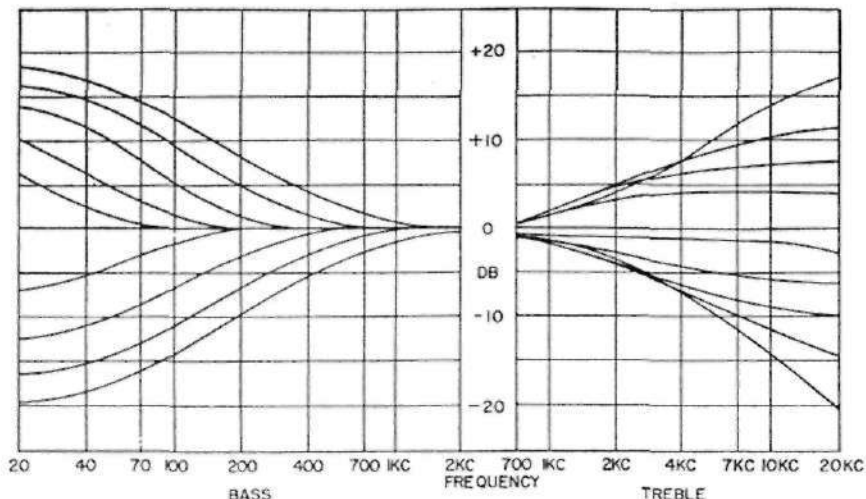
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TYPICAL INSTALLATION
AUDIO COMPENSATOR C-4

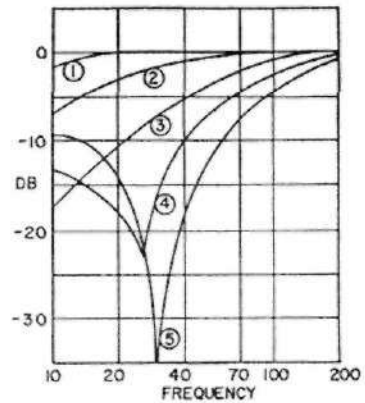


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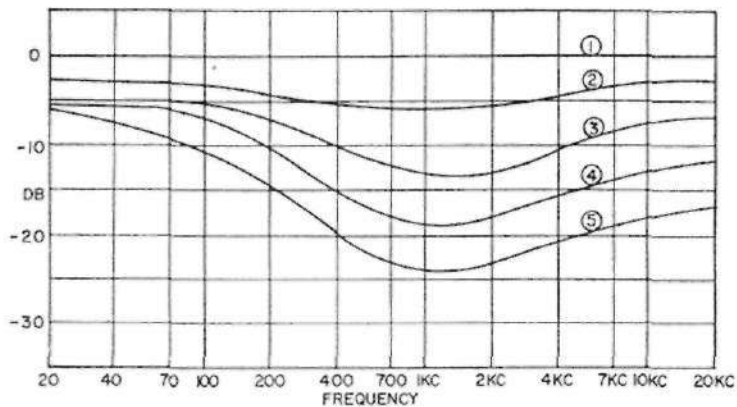
TYPICAL INSTALLATION
AUDIO COMPENSATOR C-4P
(SELF POWERED)



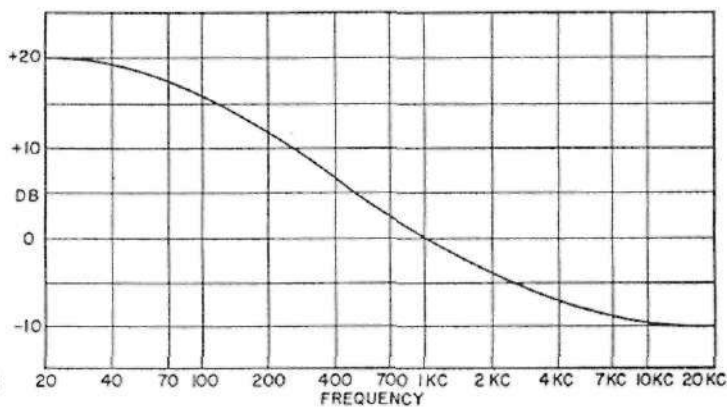
TONE CONTROLS
(ALL CHANNELS)



RUMBLE FILTER
(MIC & PHONO CHANNELS ONLY)

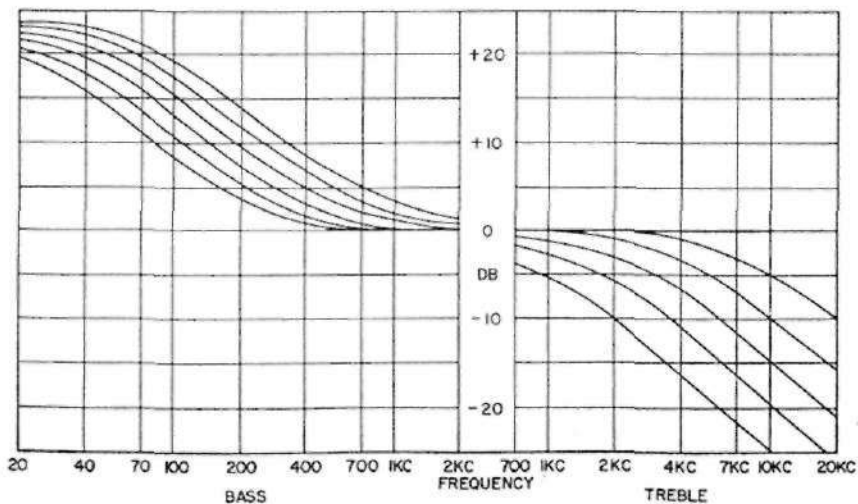


AURAL COMPENSATOR
(ALL CHANNELS)



NARTB TAPE
PLAYBACK COMPENSATION
(PHONO CHANNELS ONLY)

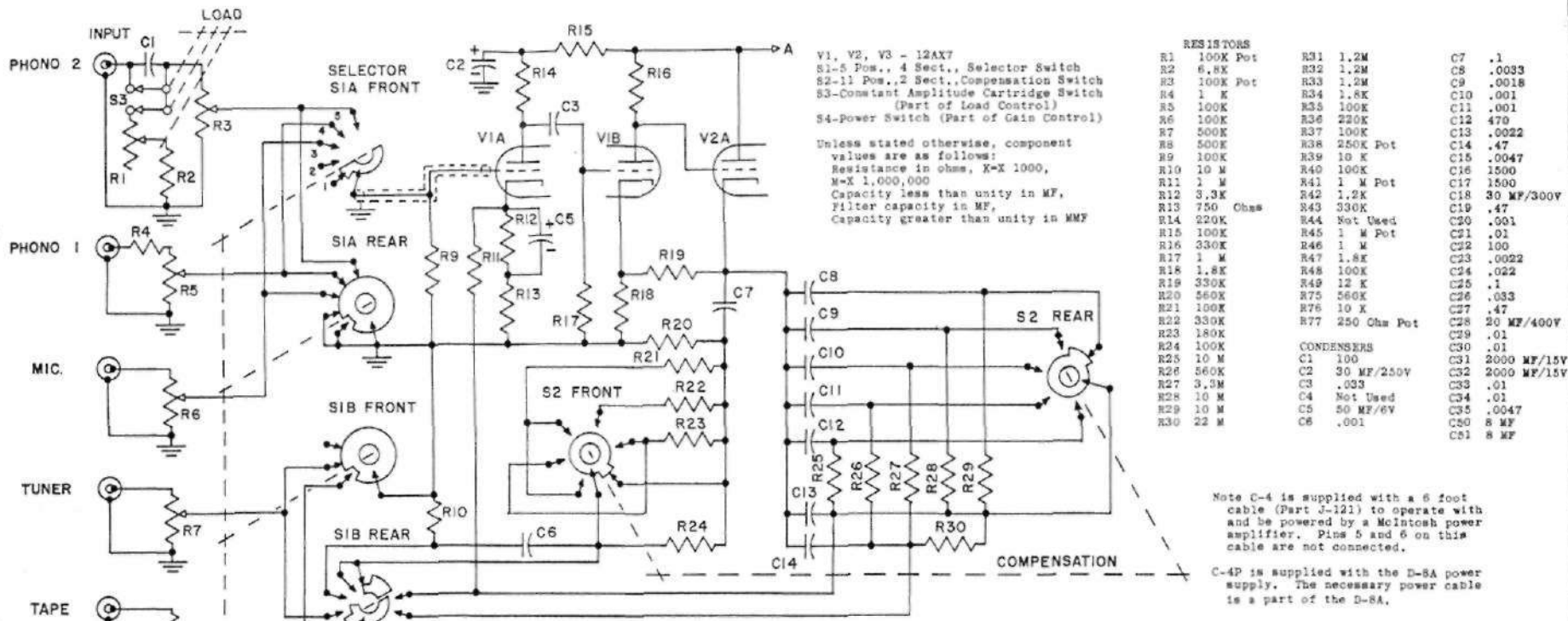
BASS SWITCH "950" DEPRESSED
BASS TONE -1
TREBLE TONE -2.5



(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)

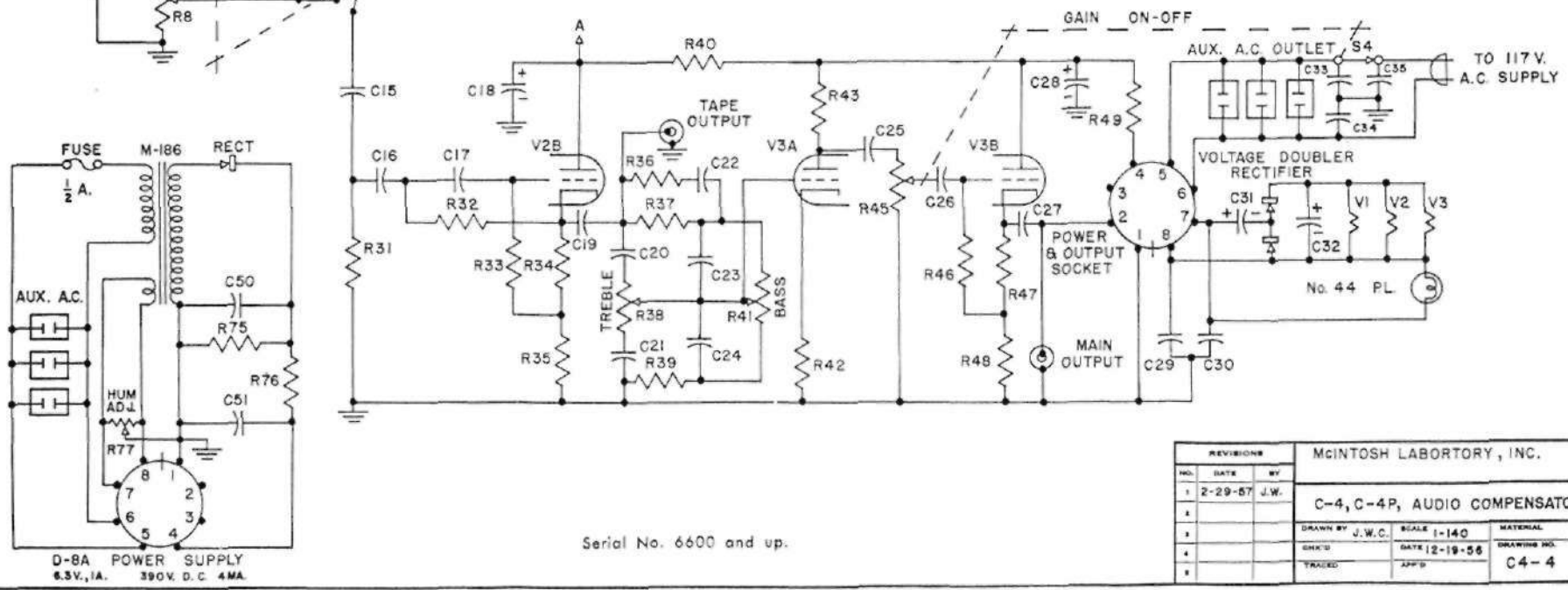
Unless stated otherwise, component values are as follows:
 Resistance in ohms, K=X 1000,
 M=X 1,000,000
 Capacity less than unity in MF,
 Filter capacity in MF,
 Capacity greater than unity in MMF

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

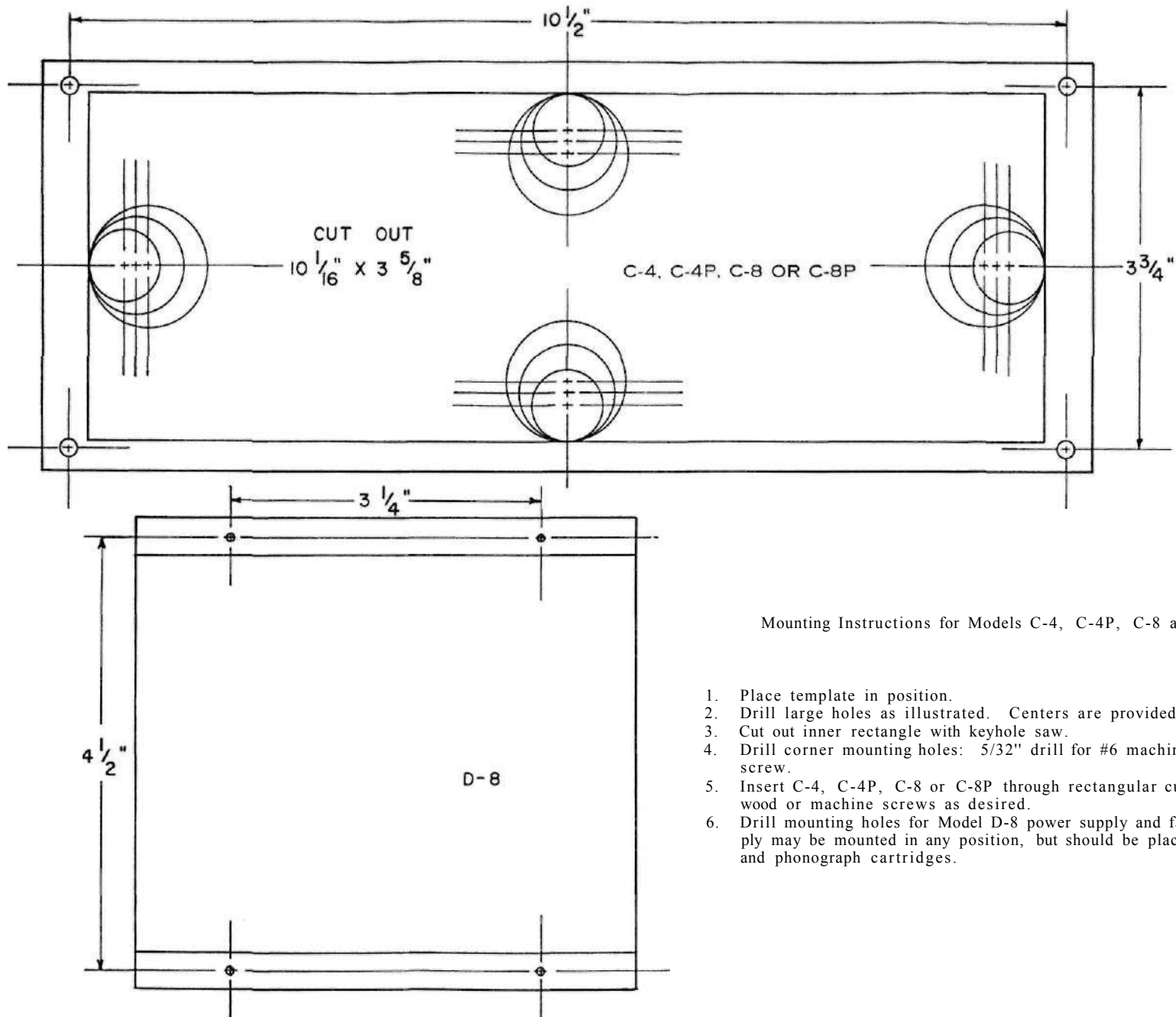


For Finest Listening . . .

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.