

THE FISHER

Master Audio Control



INSTALLATION, OPERATING
AND SERVICE INSTRUCTIONS



SERIES 80-C

FISHER RADIO CORPORATION • NEW YORK

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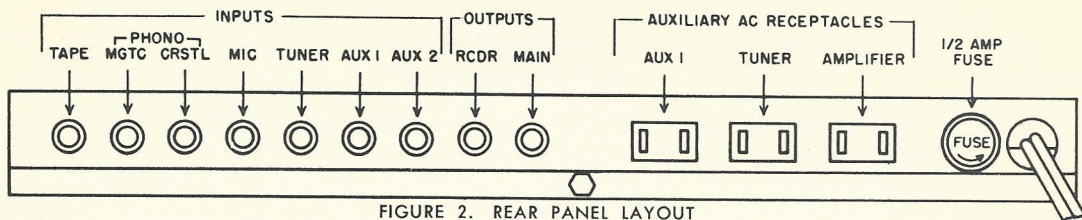


FIGURE 2. REAR PANEL LAYOUT

ELECTRICAL INSTALLATION

AC POWER CONNECTIONS. THE FISHER MASTER AUDIO CONTROL, Series 80-C operates on 105-125 volts, 50-60 cycle AC. Three auxiliary AC receptacles will be found on the rear apron (see FIGURE 2.) These can be used for an FM-AM tuner, amplifier, and any other auxiliary equipment such as a tape recorder, etc. **CAUTION:** Make certain that the power consumed from any *one* receptacle does not exceed 350 watts and that the combination of *all* auxiliary power does not exceed 600 watts. In connecting the power cords of auxiliary equipment to the Series 80-C, follow the designations shown above the receptacles. That is, connect the tuner to the receptacle labeled TUNER AC, the amplifier to the AC receptacle labeled AMPL AC, etc. The exclusive FISHER circuitry of this unit has been engineered to supply power to your auxiliary equipment **ONLY** when needed, completely automatically. Thus your tuner, for example, need never dissipate wasted power when you are listening to phonograph recordings.

INPUT CONNECTIONS. Inputs Aux 1 and Aux 2 are electrically identical and may be used for playback from self-contained tape recorders, for TV sound, or any other signal source having at least 0.1 volt output. Only the Aux 1 input has the power-conserving feature described above, and should therefore be used for that auxiliary equipment which you want turned off automatically when it is not in use. Any FM or FM-AM tuner can be connected to the appropriately marked input. On a tuner having its own tone controls, connection should be made directly to the detector output (before the tone controls) if possible. Most tuners identify this output as "Detector Output." One low-level input, identified as MGNTC, is for connection to magnetic phonograph cartridges such as the GE, Pickering, Audak, etc. The adjacent phono input, labeled CRSTL, is for connection to Ceramic, Crystal, FM type, or any other Constant Amplitude cartridges. These two phono inputs *cannot* be used simultaneously. There is a third low-level input for use with most dynamic, crystal, or ribbon microphones. Finally, the input identified as TAPE is for direct con-

nection of the playback head of any tape recorder or tape transport mechanism, for listening to pre-recorded tape. All input connections are made by means of standard RETMA type plugs. These are supplied with the equipment.

OUTPUT CONNECTIONS. The output of the Series 80-C can be connected directly to any of THE FISHER Amplifiers or to any amplifier having a minimum sensitivity of three volts. Connection to the amplifier is made from the MAIN OUTPUT jack (see FIGURE 2) to the input of the power amplifier by means of the pin-to-pin cable supplied. However, the distance between units need not be limited by this cable length. Any length up to one hundred feet can be used. A second output will be found on the rear apron of the Series 80-C, marked RCDR. This output can be used to feed a signal to the input of a tape, wire, or disc recorder having its own amplifier. The Series 80-C TONE and VOLUME Controls do not affect the signal at *this* output. In that way, the main output can be varied with the MASTER VOLUME and TONE Controls for monitoring purposes, without affecting the recording.

OPERATING INSTRUCTIONS

INITIAL SET-UP

- 1: Turn all MIXER LEVEL CONTROLS to zero (fully counter-clockwise.)
- 2: Turn MASTER VOLUME CONTROL to zero.
- 3: Set TONE CONTROLS to uniform response position (indicator dots at the top.)
- 4: Set the LOUDNESS BALANCE switch in the OFF position.
- 5: Release all CHANNEL SELECTOR BUTTONS by depressing any one of them slightly.
- 6: The LF and HF switches can be left in any position.

TUNER OPERATION

Before proceeding with the following, connect the tuner in accordance with the instructions above, under INPUT CONNECTIONS. If it is not possible to by-pass the volume and/or tone controls of the tuner, set its tone controls to their uniform response position, turn up the volume control about half way and turn on the tuner power switch. IT SHOULD NOT LIGHT UP, AS YET. Turn on the power switch of the

Series 80-C by rotating the MASTER VOLUME CONTROL slightly clockwise until a click is heard. Press the TUNER CHANNEL SELECTOR Button. The jewelled indicator light directly below the button will show that this channel is now in use. Allow sufficient time for the tuner to warm up. Rotate the MASTER VOLUME CONTROL about half way, clockwise. Rotate the TUNER-MIXER-LEVEL CONTROL until sound is heard; then proceed to tune in a station. The final setting of these controls can now be made, during which the action of the LOUDNESS BALANCE CONTROL will be considered. Because of the automatic feature of this Control, the following considerations should be studied carefully *before proceeding*, as they apply equally to operation of all the channels of the Series 80-C.

At low volume, human hearing does not respond with equal efficiency to *all* frequencies of the audible spectrum. At such volume, hearing follows a definite pattern, losing sensitivity to both low and high frequencies (with respect to the middle register) as the volume level decreases. Since the average listening level is often below that of the original performance, it is necessary that some form of equalization be incorporated to compensate for the resulting loss of balance. Such compensation occurs automatically when the LOUDNESS BALANCE CONTROL is on. Both the low and high frequencies are accentuated by this circuit as the volume is decreased. The amount of accentuation is inversely proportional to the volume setting. For proper use of the LOUDNESS BALANCE CONTROL, a good balance must be established by correct relative setting of the MASTER VOLUME CONTROL and MIXER LEVEL CONTROLS, as against the volume of sound in the room. This depends in large measure on the associated equipment, room acoustics, and one's own taste. A close approximation may be accomplished as follows:

1. Set the MASTER VOLUME CONTROL up one-third.
2. Turn the LOUDNESS BALANCE SWITCH to MAXIMUM (fourth position of switch.)
3. Vary the appropriate MIXER LEVEL CONTROL until the resulting room volume is at approximately the level of the average speaking voice. This setting of the LOUDNESS BALANCE SWITCH affords the maximum amount of low-frequency compensation as well as a small amount of high-frequency correction, as shown in FIGURE 3A.

The third and second positions (clockwise) of the LOUDNESS BALANCE SWITCH provide correspondingly less low frequency compensation and no high frequency correction. The fre-

quency response curves for these switch settings are shown in FIGURES 3B and 3C. With the LOUDNESS BALANCE SWITCH completely counterclockwise (OFF) no compensation takes place and the Model 80-C has conventional, uniform frequency response throughout the audible range for all settings of the MASTER VOLUME CONTROL.

The ultimate setting of these controls must perforce depend on personal taste. It should be noted that setting the MIXER LEVEL CONTROL at a point higher than that suggested will cause a *greater* accentuation of the low and high frequencies for a given room volume. A lower setting will result in *less* accentuation of the low and high frequencies. See FIGURES 3-A,-B,-C.

Figure 3-A. Loudness Balance Control, Maximum Position

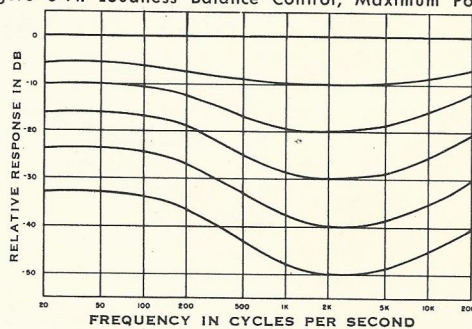


Figure 3-B. Loudness Balance Control. Second Position

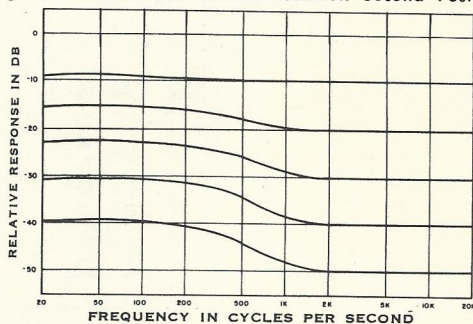
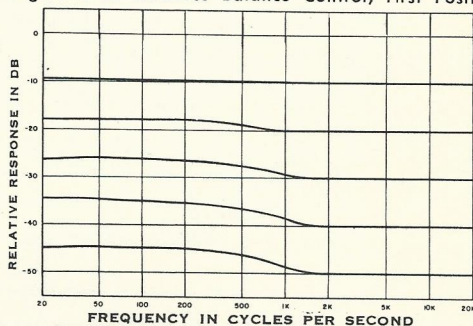
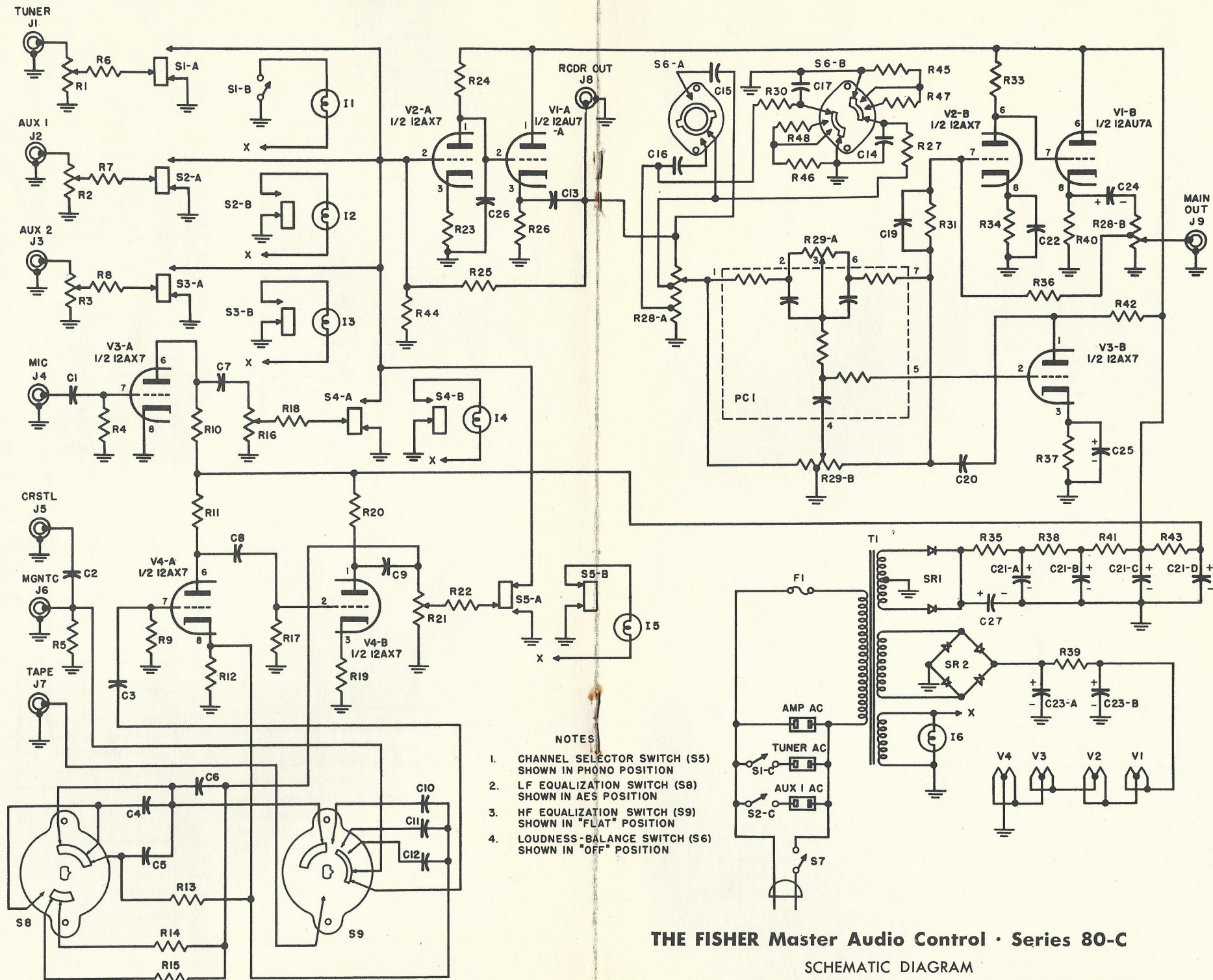


Figure 3-C. Loudness Balance Control, First Position





THE FISHER Master Audio Control · Series 80-C

SCHMATIC DIAGRAM

PARTS DESCRIPTION LIST

SYMBOL	DESCRIPTION	PART NUMBER	SYMBOL	DESCRIPTION	PART NUMBER
C-1	Capacitor, Ceramic: 0.01 mfd; 600 V	CK62GP103V6	R-28-A,-B	Potentiometer, Composition; Dual Vol.-Loudness Control	RS-546-107
C-2	Capacitor, Ceramic: 100 mfd; 500 V	CC21GP101M5	R-29-A,-B	Potentiometer, Composition: Dual Tone Control	R-546-106
C-3	Capacitor: 0.022 mmfd; 200 V	C68P223M2	R-30	Resistor, Composition: 10,000 ohms, 10%; 1/2 W	RC20BF103K
C-4	Capacitor: 0.0033 mfd; 10%; 200 V	C68P332K2	R-31	Resistor, Composition: 100,000 ohms, 10%; 1/2 W	RC20BF104K
C-5	Capacitor, Ceramic: 720 mmfd; 10%; 500 V	CC21GP721K5	R-32	Resistor, Composition: 150,000 ohms, 10%; 1/2 W	RC20BF154K
C-6	Capacitor: 0.0022 mfd; 10% 200 V	C68P222K2	R-33	Resistor, Composition: 220,000 ohms, 10%; 1/2 W	RC20BF224K
C-7	Capacitor: 0.047 mfd; 400 V	C68P473M4	R-34	Resistor, Composition: 2700 ohms, 10%; 1/2 W	RC20BF272K
C-8	Capacitor, Ceramic: 0.01 mfd; 600 V	CK62GP103V6	R-35	Resistor, Composition: 3300 ohms, 10%; 1/2 W	RC20BF332K
C-9	Capacitor: 0.047 mfd; 400 V	C68P473M4	R-36	Resistor, Composition: 470,000 ohms, 10%; 1/2 W	RC20BF474K
C-10	Capacitor, Ceramic: 440 mmfd; 10%; 500 V	CC21GP441K5	R-37	Resistor, Composition: 2700 ohms, 10%; 1/2 W	RC20BF272K
C-11	Capacitor, Ceramic: 120 mmfd; 10%; 500 V	CC21GP121K5	R-38	Resistor, Composition: 3300 ohms, 10%; 1/2 W	RC20BF332K
C-12	Capacitor, Ceramic: 220 mmfd; 10%; 500 V	CC21GP221K5	R-39	Resistor, Composition: 15 ohms, 10%; 2 W	RC20BF473K
C-13	Capacitor: 0.1 mfd; 200 V	C68P104V2	R-40	Resistor, Composition: 47,000 ohms, 10%; 1/2 W	RC20BF473K
C-14	Capacitor: 0.02 mfd; 10%; 200 V	C68P203K2	R-41	Resistor, Composition: 3300 ohms, 10%; 1/2 W	RC20BF332K
C-15	Capacitor, Ceramic: 1000 mmfd; 10%; 500 V	CC26GP102K5	R-42	Resistor, Composition: 100,000 ohms, 10%; 1/2 W	RC20BF104K
C-16	Capacitor, Ceramic: 470 mmfd; 10%; 500 V	CC21GP471K5	R-43	Resistor, Composition: 10,000 ohms, 10%; 1/2 W	RC20BF103K
C-17	Capacitor: 0.02; mfd; 10%; 200 V	C68P203K2	R-44	Resistor, Composition: 1 megohm, 10%; 1/2 W	RC20BF105K
C-18	Capacitor, Ceramic: 220 mmfd; 10%; 500 V	CC21GP221K5	R-45, R-46	Resistor, Composition: 10,000 ohms, 10%; 1/2 W	RC20BF103K
C-19	Capacitor, Ceramic: 68 mmfd; 10%; 500 V	CC21GP680K5	R-47, R-48	Resistor, Composition: 15,000 ohms, 10%; 1/2 W	RC20BF153K
C-20	Capacitor: 0.1 mfd; 400 V	C68P104M4	S-1, 2, 3, 4, 5	Switch: Push-Button	S-546-113
C-21A,-B,-C,-D	Capacitor, Electrolytic: 40 mfd; 250 V	C-546-115	S-6	Switch: Loudness, part of R-28	
C-22	Capacitor: 0.0047 mfd; 200 V	C68P472M2	S-7	Switch: AC Power, part of R-28	
C-23A,-B	Capacitor, Electrolytic: 1000 mfd; 30 V	C-546-116	S-8	Switch: Lever	S-50022-4
C-24	Capacitor, Electrolytic: 1 mfd; 250 V	C-546-126	S-9	Switch: Lever	S-50022-5
C-25	Capacitor, Electrolytic: 25 mfd; 10 V	C-3340	SR-1	Selenium Rectifier: Full-Wave	SR-3283
C-26	Capacitor, Ceramic: 300 mmfd; 10%; 500 V	CC21GP301K5	SR-2	Selenium Rectifier: Bridge	SR-3078
C-27	Capacitor, Electrolytic: 10 mfd; 300 V	C-546-133	T-1	Transformer: Power	T-546-114
F-1	Fuse: 3 AG; 1/2 Amp.	F-3297			
I-1, I-2, I-3, I-4, I-5, I-6	Lamp: Panel	I-50009-2			
J-1, J-2, J-3, J-4, J-5, J-6, J-7, J-8, J-9	Jack: 1 female contact	J-3143			
PC-1	Printed Circuit: Tone Control	PC-531-128			
R-1, R-2, R-3	Potentiometer, Composition: 500,000 ohms	R-50000-13			
R-4	Resistor, Composition: 18 megohms, 10%; 1/2 W	RC20BF186K			
R-5	Resistor, Composition: 47,000 ohms, 10%; 1/2 W	RC20BF473K			
R-6, R-7, R-8	Resistor, Composition: 220,000 ohms, 10%; 1/2 W	RC20BF224K			
R-9	Resistor, Composition: 2.2 megohms, 10%; 1/2 W	RC20BF225K			
R-10, R-11	Resistor, Composition: 220,000 ohms, 10%; 1/2 W	RC20BF224K			
R-12	Resistor, Composition: 2700 ohms, 10%; 1/2 W	RC20BF272K			
R-13	Resistor, Composition: 150,000 ohms, 10%; 1/2 W	RC20BF154K			
R-14	Resistor, Composition: 2.2 megohms, 10%; 1/2 W	RC20BF225K			
R-15	Resistor, Composition: 3.3 megohms, 10%; 1/2 W	RC20BF335K			
R-16	Potentiometer, Composition: 500,000 ohms	R-50000-13			
R-17	Resistor, Composition: 2.2 megohms, 10%; 1/2 W	RC20BF225K			
R-18	Resistor, Composition: 220,000 ohms, 10%; 1/2 W	RC20BF224K			
R-19	Resistor, Composition: 2200 ohms, 10%; 1/2 W	RC20BF222K			
R-20	Resistor, Composition: 220,000 ohms, 10%; 1/2 W	RC20BF224K			
R-21	Potentiometer, Composition: 500,000 ohms	R-50000-13			
R-22	Resistor, Composition: 220,000 ohms, 10%; 1/2 W	RC20BF224K			
R-23	Resistor, Composition: 2700 ohms, 10%; 1/2 W	RC20BF272K			
R-24	Resistor, Composition: 220,000 ohms, 10%; 1/2 W	RC20BF224K			
R-25	Resistor, Composition: 390,000 ohms, 10%; 1/2 W	RC20BF394K			
R-26	Resistor, Composition: 47,000 ohms, 10%; 1/2 W	RC20BF473K			
R-27	Resistor, Composition: 10,000 ohms, 10%; 1/2 W	RC20BF103K			

VOLTAGE MEASUREMENTS

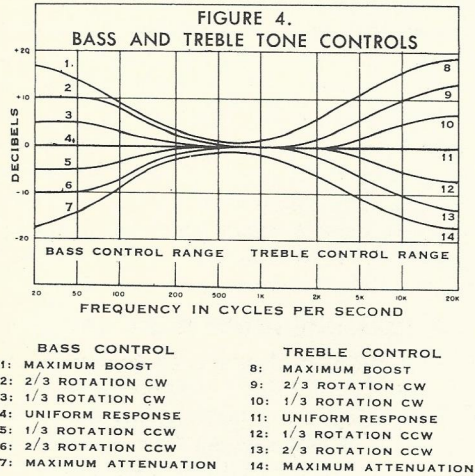
TUBE	PIN NUMBERS								
	1	2	3	4	5	6	7	8	9
V-1, 12AU7	195	115	120	18	18	195	115	118	24
V-2, 12AX7	115	0	1	12	12	115	0	1	18
V-3, 12AX7	150	0	1	6	6	87	—	0	12
V-4, 12AX7	100	0	1	0	0	106	0	1	6

RESISTANCE MEASUREMENTS

TUBE	PIN NUMBERS								
	1	2	3	4	5	6	7	8	9
V-1, 12AU7	INF	INF	47K	0	0	INF	INF	2.7K	—
V-2, 12AX7	INF	330K	2.7K	—	—	INF	INF	0	—
V-3, 12AX7	INF	400K	2.7K	—	—	INF	18M	2.7K	—
V-4, 12AX7	INF	2.2M	2.7K	—	—	INF	2.2M	—	—

All measurements taken with vacuum tube voltohmmeter. Equipment operated at 117V AC 60 cycles. All resistance measurements taken with respect to chassis. "INF" readings will depend on charging of C-21. Tone Controls set in flat position; Volume Control at zero; Loudness Switch OFF; Mixer Level Controls OFF; all Channel Selectors OUT.

TONE CONTROLS: When the BASS and TREBLE Tone Control dots are at the top, the response is uniform throughout the range. Turning either Control to the right boosts the response, turning to the left attenuates the response. The effective range of these controls is shown in FIGURE 4. The preferred position of the TONE CONTROLS will depend on personal taste and the particular program material being played. In your experiments to acquire the 'feel' of the controls, start with the dots in the top position (uniform response.)



PHONOGRAPH OPERATION

In view of the variety of recording characteristics employed by record manufacturers, both the bass and treble frequencies must be properly equalized to match the original recording techniques. Because of the physical limitations of the record groove, frequencies below approximately 500 cycles are recorded with gradually *decreasing* amplitude as one approaches the lowest frequencies. Conversely, in order to obtain an improved signal-to-noise ratio, treble *boost* is incorporated. The point at which low frequency attenuation begins, and the amount of high frequency pre-emphasis employed, vary considerably from manufacturer to manufacturer. THE FISHER MASTER AUDIO CONTROL, Series 80-C, provides sixteen combinations of equalization for both low and high frequencies. Thus, knowing a given manufacturer's recording characteristics, the user can properly equalize for that recording and achieve optimum balance. A list of recommended settings of the two phono equalization switches for various record manufacturers is enclosed.

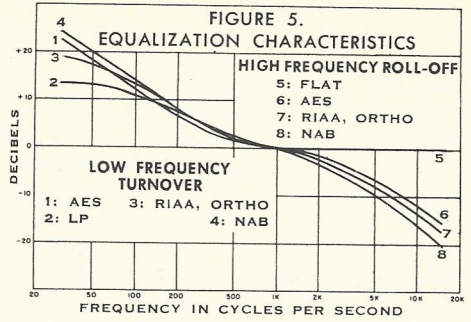


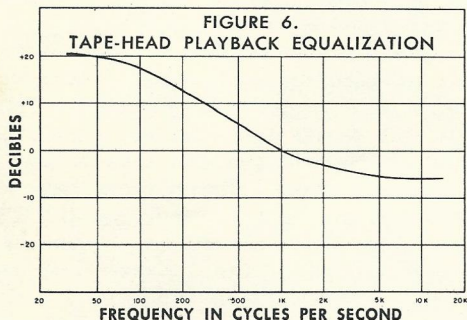
FIGURE 5 shows the equalization curves available with various settings of the phono equalization switches when using magnetic cartridges. Correct equalization is accomplished as well with ceramic, crystal or constant amplitude cartridges. It should be noted, however, that some of the popular magnetic cartridges presently manufactured require compensation at high frequencies to smooth out their response. For this type of compensation a resistor is normally connected across the cartridge terminals. THE FISHER MASTER AUDIO CONTROL obviates the need for this resistor in most cases, because a 47,000 ohm resistor is already wired across the input jack, making it suitable for use with GE, Audak, and Fairchild cartridges, without further modification. The Pickering cartridge should be equipped with an additional 47,000 ohm resistor across its terminals for optimum performance. For other cartridges, we suggest that you check the manufacturer's specifications to determine the loading required to achieve a 'flat' response. Depress the PHONO SELECTOR BUTTON, (the TUNER BUTTON will be automatically released, turning off that channel as well as the power to the tuner itself) and set MASTER VOLUME and PHONO MIXER LEVEL CONTROLS as noted under TUNER OPERATION.

MICROPHONE OPERATION

Most dynamic, crystal or ribbon microphones can be used with THE FISHER MASTER AUDIO CONTROL without any additional preamplification. Low impedance microphones require a matching transformer. Simply connect the microphone to the Mic input jack on the rear apron, press the MIC CHANNEL SELECTOR BUTTON and adjust the MIC MIXER LEVEL CONTROL to give sufficient gain, in conjunction with the MASTER VOLUME CONTROL, for the particular application.

TAPE RECORDER PLAYBACK

THE FISHER MASTER AUDIO CONTROL enables the user to listen to the growing library of pre-recorded tapes without having to purchase an expensive complete tape recorder. All that is needed is a commercially available tape transport mechanism incorporating a playback head. The cable from this playback head should be connected directly to the TAPE input jack on the rear apron of the Series 80-C. Press the PHONO CHANNEL SELECTOR BUTTON once again and shift BOTH equalization levers to the TAPE position. This setting connects the playback head to a special tape preamplifier, properly equalized for tape playback in accordance with industry-wide accepted NARTB tape recording standards. See FIGURE 6. Adjust MIXER LEVEL and VOLUME CONTROLS as before. DO NOT connect a complete, self-contained tape recorder to this input. Such recorders are best connected to either one of the two auxiliary high-level inputs.



ADDITIONAL APPLICATIONS

The two auxiliary inputs on THE FISHER MASTER AUDIO CONTROL are for the audio portion of a TV receiver, the playback output of self-contained tape and wire recorders, additional phono pre-amps, etc. Connect the equipment to the AUX 1 input (if you desire that its AC be automatically switched by the Series 80-C) or to AUX 2. Press the appropriate CHANNEL SELECTOR BUTTON and adjust the MIXER LEVEL CONTROLS as described earlier.

MIXING FACILITIES

THE FISHER Series 80-C incorporates complete interchannel mixing facilities normally available only in the costliest broadcast consoles. That is, two or more signal sources may be operated simultaneously and their relative amplitudes varied as desired. Thus, a microphone may be used for purposes of narration, while listening to music in the background. Singing voices can be superimposed on instru-

mental recordings and the resultant combination preserved on tape, etc. The tape recordist will find this feature outstanding, because he can now achieve all the effects usually possible only in professional sound recording studios. Mixing is extremely simple with your Series 80-C. Simply press *two* or more CHANNEL SELECTOR BUTTONS SIMULTANEOUSLY. Individual indicator lights show the channel or channels in use. Mixing, to any degree, is accomplished by varying the MIXER LEVEL CONTROLS of each channel, as required. As many as five channels can be thus blended simultaneously, if desired. An exclusive, self-compensating input impedance circuit enables one to make extreme level changes on one channel without interaction on any other channels in use at the time.

Should you wish to disengage all channels but the TUNER, for example, after mixing two or more channels, simply press the TUNER CHANNEL SELECTOR BUTTON once again and all channels OTHER than TUNER will be released automatically.

A COMPLETE HOME MUSIC SYSTEM

Careful selection of associated equipment for use with THE FISHER MASTER AUDIO CONTROL will result in a perfectly matched, high fidelity home music system. The extreme flexibility and versatility of THE FISHER MASTER AUDIO CONTROL permits the use of any or all of the components of such a system. Those seeking the ultimate in associated equipment will find it in THE FISHER LABORATORY STANDARD AMPLIFIERS, and THE FISHER FM and FM-AM TUNERS. Complete specifications are available on request.

AT YOUR SERVICE

It is the constant desire of Fisher Radio Corporation to have your FISHER equipment give you its best possible performance. Toward that objective, we solicit your correspondence on any special problems that may arise. After you have had an opportunity to familiarize yourself with THE FISHER equipment you purchased, we would appreciate your letting us know how it is meeting your requirements.

SPECIAL NOTE: To maintain your equipment at peak performance, may we suggest that you avail yourself of the facilities and factory trained personnel at our Service Department.

FISHER RADIO CORPORATION

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NOTES

