ALTEC®

729A ACOUSTA-VOICETTE™ STEREO EQUALIZER

OPERATING INSTRUCTIONS

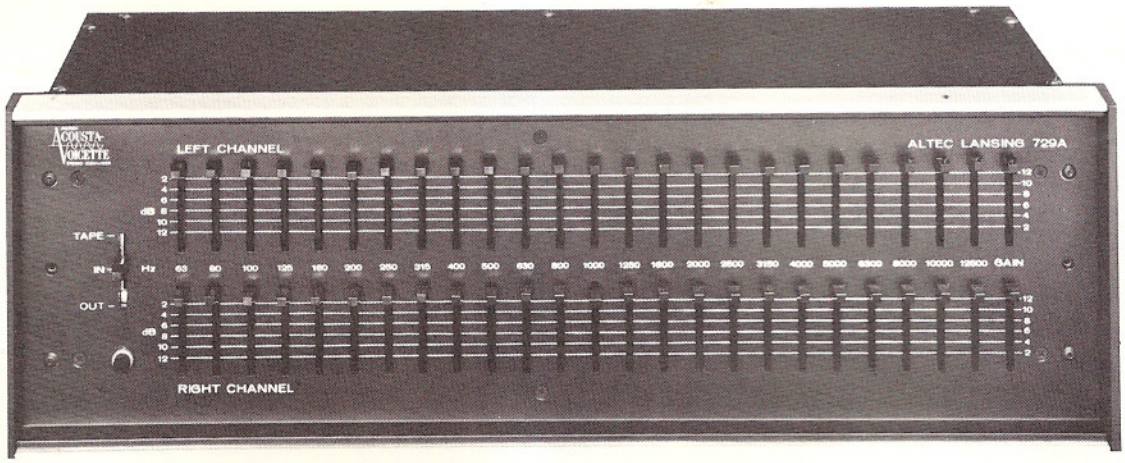

Figure 1. 729A Acousta-Voicette Stereo Equalizer

SPECIFICATIONS

Type:	2 channel active filter critical band equalizer
Frequency Response Range:	20 Hz - 20 KHz ±1 dB at less than 0.5 THD
Equalization Center Frequencies:	From 63 Hz to 12.5 KHz at the standard ISO 1/3 octave centers
Filter Type:	48 active filters, designed for 7 dB half pad crossover with adjacent filters
Maximum Insertion Loss (1 section):	-14 dB at section center frequency
Maximum Reinsertion Gain:	17 dB
Input Level:	4.5V rms maximum with GAIN control at minimum
Output Level:	4.5V rms with 10K ohm load
Input Impedance:	100K ohm
Output Load:	10K ohm nominal
Noise Level:	80 dB below maximum rated output
Channel Separation:	Greater than 60 dB down
Operating Controls:	1 Variable Equalizer Control for each 1/3 octave Center Frequency (48 total), from 63 Hz to 12.5 KHz per channel 1 Variable Reinsertion GAIN control per channel 1 TAPE, equalizer IN, equalizer OUT switch

DESCRIPTION

ALTEC'S 729A Acousta-Voicette Stereo Equalizer is a 100 percent solid-state 2 channel equalizer, designed to adjust the electrical response of the music system so that the loudspeaker and room coupling provides a flat acoustical response at the listener's ear. Acousta-Voicette equalizes the sound system to match the room using 24 band rejection filters per channel, plus a broadband reinsertion GAIN control for each channel. (Figure 1). This instruction manual provides information on how to equalize your sound system using the ALTEC Acousta-Voicette.

OPERATION

Acousta-Voicette was designed primarily to complement ALTEC'S 724A Tuner/Preamplifier, or 724A Stereo Receiver, but is adaptable to any standard receiver. When used with the 724A/725A (see Figure 2), after equalization is completed, the IN/OUT position of the TAPE/IN/OUT switch becomes the only functional variable control on the 729A allowing A/B evaluation of the tone quality.

When used with a standard receiver, INPUT/OUTPUT connections are made through the 'TAPE MONITOR' and 'RECORD OUT' jacks found on most receivers. The TAPE MONITOR switch of the receiver becomes the A/B switch, and the TAPE position of the 729A now provides the TAPE MONITOR function. The rear of the 729A chassis contains TAPE INPUT and RECORD OUT jacks for connection of a tape recorder (see Figure 3).

Specifications and components subject to change without notice. Overall performance will be maintained or improved.

ALTEC®
SOUND PRODUCTS DIVISION
1515 S. Manchester Ave., Anaheim, Calif. 92803

42-02-042078-03
Litho in USA CP-1174-0.5K

Acousta-Voicette is equipped with a self-contained power supply, which is activated by the main sound system power ON/OFF switch, when the 729A is plugged into a "Switched" (120V, 50/60 Hz), receptacle on the rear of the receiver. (Figure 4).

CONTROLS (FRONT PANEL)

LEFT & RIGHT CHANNEL FILTERS: Modified twin "T" active band rejection notch filters, 24 per channel, operating in cascade, and centered at 1/3 octave intervals from 63 Hz to 12.5 KHz, each filter providing 0 dB to -14 dB loss at center frequency.

GAIN: A broadband reinsertion gain control, vertical mounted, linear slide (one per channel).

TAPE/IN/OUT: For A/B comparison and tape monitoring, selectable to:

OUT position, which bypasses the filter and gain of the equalizer.

TAPE/IN/OUT (Continued):

IN position, in which the filter and gain adjustments are effective.

TAPE position, same as "IN" position, however, any signal applied must pass through an external tape recorder, and again back through the equalizer before being applied to the main receiver system.

POWER CONNECTIONS

Equipment supplied for domestic use (120 volt, 50/60 Hz), will have the power transformer primary strapped for 120 volts (terminals 2 to 3 and 4 to 5 on TB1). The power input nameplate on the chassis adjacent to the power cord will be mounted to show the appropriate side specifying the connections. To strap for 220 volt operation cut the strap between terminals 2 to 3, and 4 to 5 on TB1 and restrap 3 to 4. F1 fuse should also be changed from the 1 amp provided to a 1/2 amp fuse.

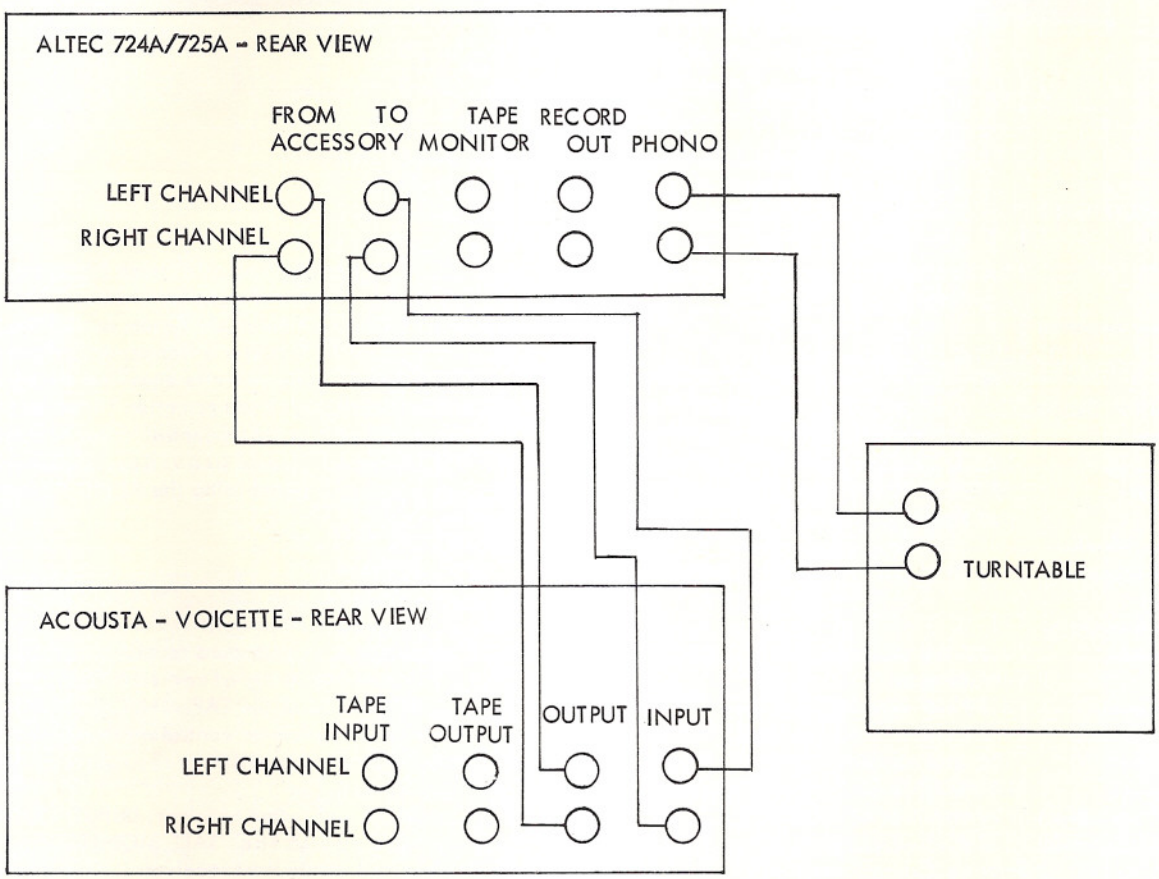

Figure 2. 729A Wiring Diagram with Altec Preamplifier

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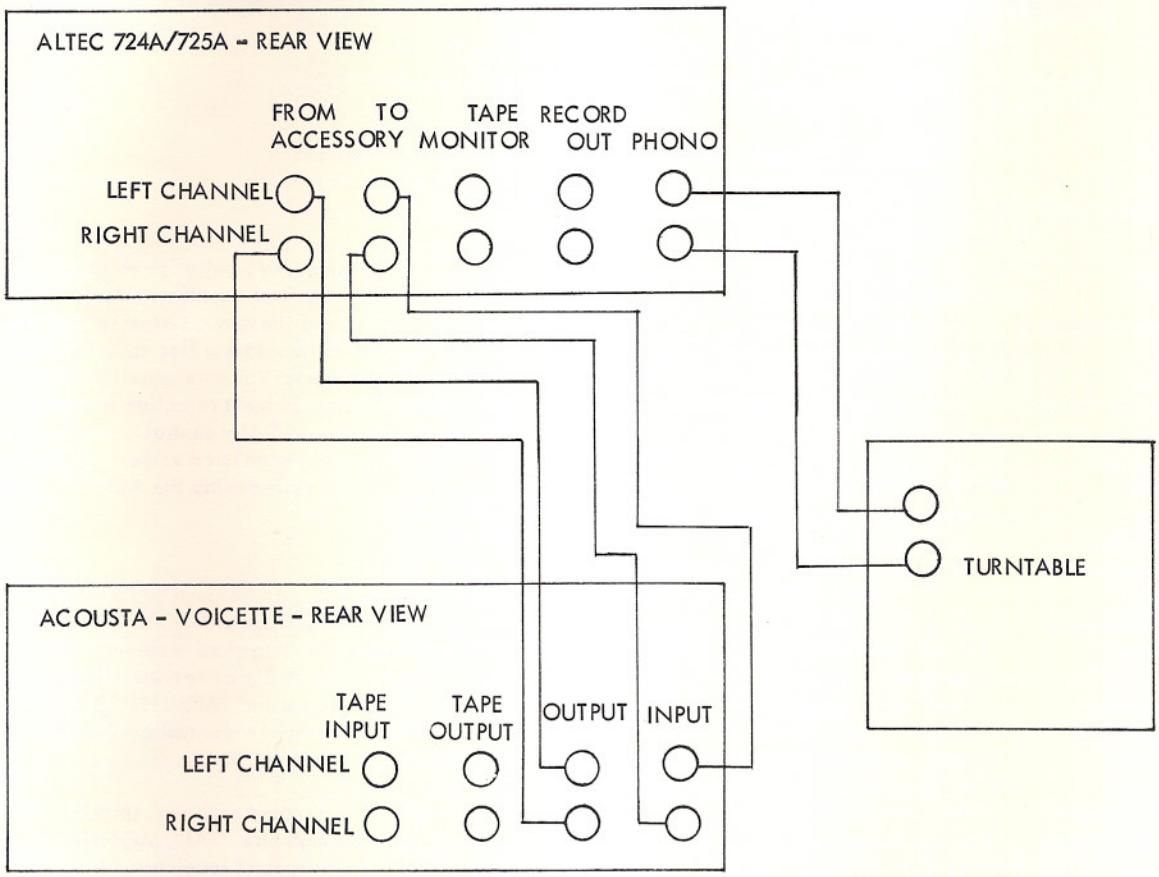


Figure 2. 729A Wiring Diagram with Altec Preamplifier

EQUALIZING THE STEREO SYSTEM

Equipment Required:

ACOUSTA-VOICETTE STEREO EQUALIZER

SOUND LEVEL METER - HEWLETT-PACKARD/ALTEC LANSING

ALTEC TEST RECORD

The ALTEC 1/3 octave Acousta-Voicette Test Record is a unique recording enabling the user to measure the frequency response of the entire component system including the room.

The record, in conjunction with a sound level meter and the ALTEC Acousta-Voicette Stereo Equalizer, allows regulation of the frequency response of the phonograph cartridge, the electronics, the loudspeaker system and the listening room, to an acoustically uniform signal at the listener's ear.

Setting the Acoustic Level

Set all cutoff filters, tone controls, etc., at their normal or "OUT" positions. Play Band No. 1 on Side B which is a 1/3 octave band of pink noise centered at 1000 Hz. Adjust the volume control of your Hi-Fidelity System until the sound level meter reads about 85 dB-SPL at the normal listening position. If for any reason the ambient noise level in the listening room exceeds 70 dB on your sound level meter, increase the volume control until the reading on your sound level meter is at least 20 dB greater than the ambient noise reading. Voice each channel separately. DO NOT touch the controls on the music system until you have made a full frequency response run.

You are now ready for the first frequency response measurement.

Inspecting the Listening Area for Standing Wave Problems

Play Side A, Bands No. 1 through No. 4 of the special Acousta-Voicette Test Record (50, 63, 80 and 100 Hz). Starting with

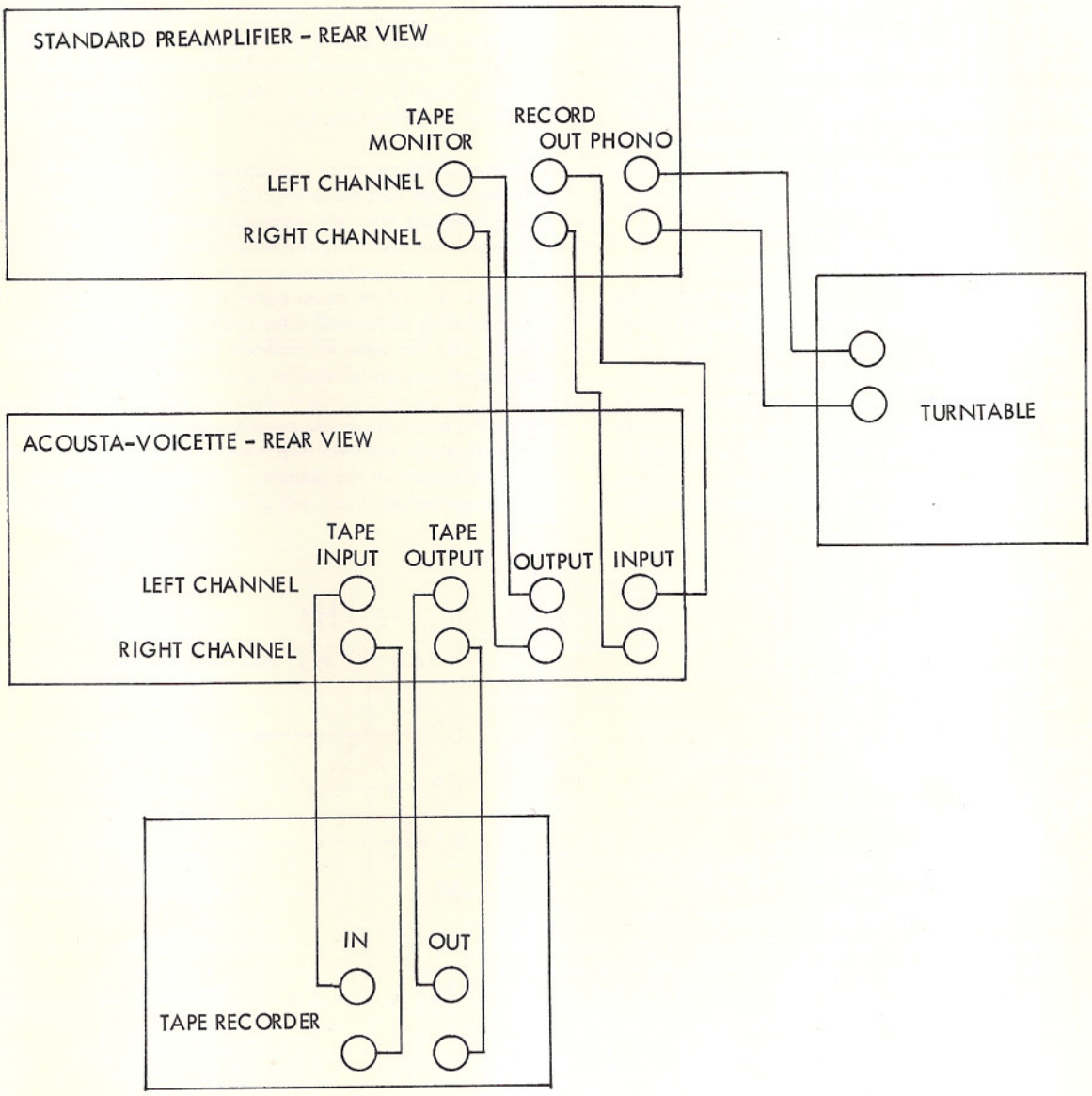


Figure 3. 729A Wiring Diagram with Standard Preamplifier

Figure 4. 729A Acousta-Voicette — Rear View

the left channel, walk toward the loudspeakers from the listening position. Note both by ear and by the sound level meter if the listening position chosen shows a major drop in loudness compared to the rest of the room.

If the listening position is found to be substantially lower in loudness for one of these tones than the remainder of the room, it is in the "null" of a standing wave pattern. Serious consideration should be given to an alternate listening position which is free of this effect. In severe cases, new locations for both loudspeaker and listener may be necessary.

Plotting the Frequency Response Chart

The accompanying charts are for your convenience in plotting the frequency response of your high fidelity sound system. Additional charts are available.

Starting at 50 Hz with the sound level meter on its 'slow' "A" scale, watch the swings taken by the meter as the 1/3 octave band of pink noise fluctuates. Try to determine the center of the swing as shown in the illustration (see Figure 5). Make a mark on the chart where the frequency line intersects the dB-SPL line, (see Figure 6). After a little practice the average user of the sound level meter finds he is in excellent agreement with others taking the same readings.

Allow the record to play through each band on Side A, and use the full minute for each band to average the reading. The last band on Side A (Band No. 14), contains pink noise and is not to be used at this time.

The frequency response measurement continues on Side B, and proceeds from 1000 Hz to 16,000 Hz. The dots at the 1/3 octave band intervals are now connected with a solid line and you have a house curve for the left channel.

It is well to plot the house curve for the right channel, although it will be set aside until after the left channel has been equalized. Use the same microphone position for measurement and correction of both channels.

After the house curve has been run, you may find that additional adjustments in the amplifier tone controls, or the speaker controls will improve the response. Do this prior to the critical tuning procedure.

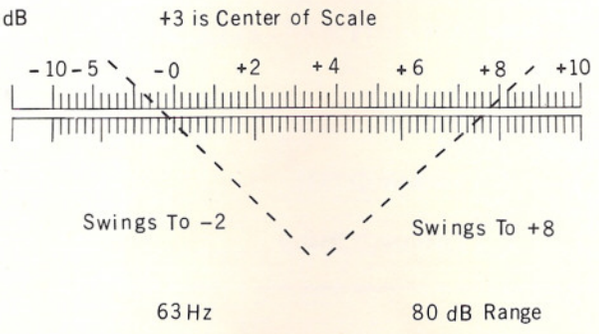


Figure 5. Sound Level Meter Scale

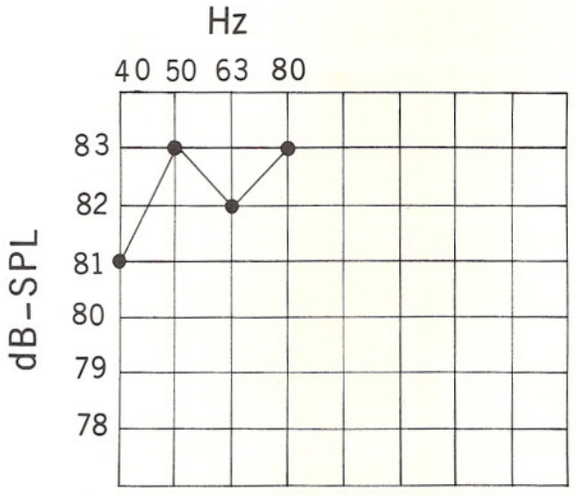


Figure 6. Frequency Line Chart

Adjusting the Acousta-Voicette Equalizers

Starting with the left channel, locate the highest peak in the frequency response. Play that band back on the system while adjusting the Acousta-Voicette filter at that frequency and watching the results on the sound level meter. Great care must be taken in using the filter to avoid over-deepening the correction.

The first 3 dB insertion will affect two bands on either side of the band chosen. After approximately 3 dB of correction, they become one band wide and detailed finishing of the frequency response curve can be obtained.

The first attempt should only smooth one or two of the highest peaks with the Acousta-Voicette filters. After this initial smoothing is accomplished, run another frequency response curve. This second curve will show the overall effect of your first adjustments. Continue in this pattern of one or two gentle adjustments at a time, followed by a new frequency response plot, until you have reached the desired uniformity of response, or until you have exceeded the correction range of the Acousta-Voicette equalizer set. Mark each final filter setting on the diagram provided (see Figure 7), for future reference.

Follow the same procedure for the right channel.

Setting Reinsertion Gain Control

At the conclusion of the tuning, use the A/B switch to adjust with the reinsertion gain control, for equal loudness in both the "IN" and "OUT" positions of the selector switch.

Wide Bands of White and Pink Noise (Bands No. 14 and 28)

The pink noise band (No. 14), is included for those individuals having access to a 1/3 octave wave analyzer, either of the conventional or real time type. The white noise band (No. 28), is useful in conjunction with a 4000 Hz octave band filter for finding the coverage angle of the loudspeaker for more intelligent placement of it, in relation to the chosen listening position.

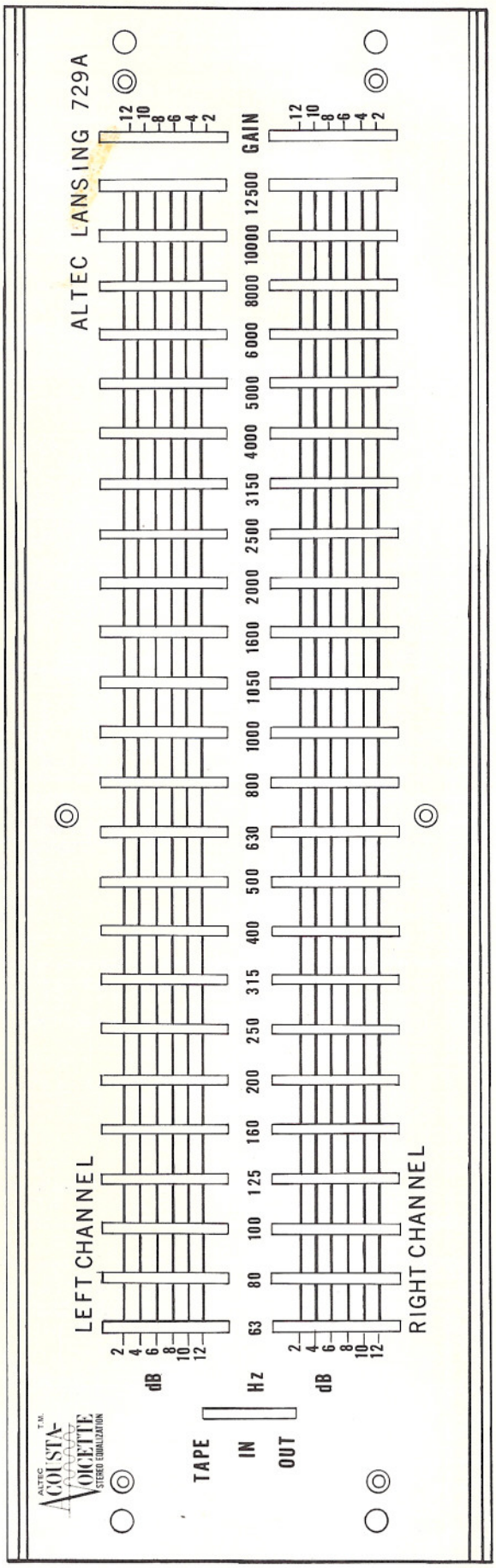


Figure 7. 729A Acousta-Voicette Filter Setting Diagram

PARTS LIST

MAIN CHASSIS

Reference Designator	Ordering Number	Name and Description
None	27-01-042113-01 -or alternate- 27-01-042433-01	PCB assembly, potentiometer board
None	27-01-042114-01	PCB assembly, filter board
C7,8	15-01-107430-01	Cap., 4000 µF, 35V
C11,12	15-02-107454-01	Cap., 100 pF ±10%, 100V
CR1	48-02-108577-01	Rectifier, 1.5A, 100V PIV
F1	51-04-100464-01	Fuse, 1A, 3AG
PH1 thru PH8	21-01-100496-01	Jack, phono
PL1	39-03-109410-01	Pilot lamp, 28V, 40 mA
Q3	48-03-109408-01	Transistor, D42C5
R51,52	47-01-102163-01	Res., 1KΩ ±10%, 1/4W
R53	47-01-102104-01	Res., 12KΩ ±5%, 1/4W
R54	47-01-102102-01	Res., 10KΩ ±5%, 1/4W
R55	47-01-102360-01	Res., 2.7KΩ±10%, 1/2W
R56	47-01-102342-01	Res., 100Ω ±10%, 1/2W
R57	47-01-102346-01	Res., 220Ω ±10%, 1/2W
S1	51-02-109411-01	Switch, 4P3T
T1	56-08-007437-01	Transformer, power

POTENTIOMETER PCB ASSEMBLY

Reference Designator	Ordering Number	Name and Description
R1 thru R50	47-06-042158-01	Pot., 20KΩ

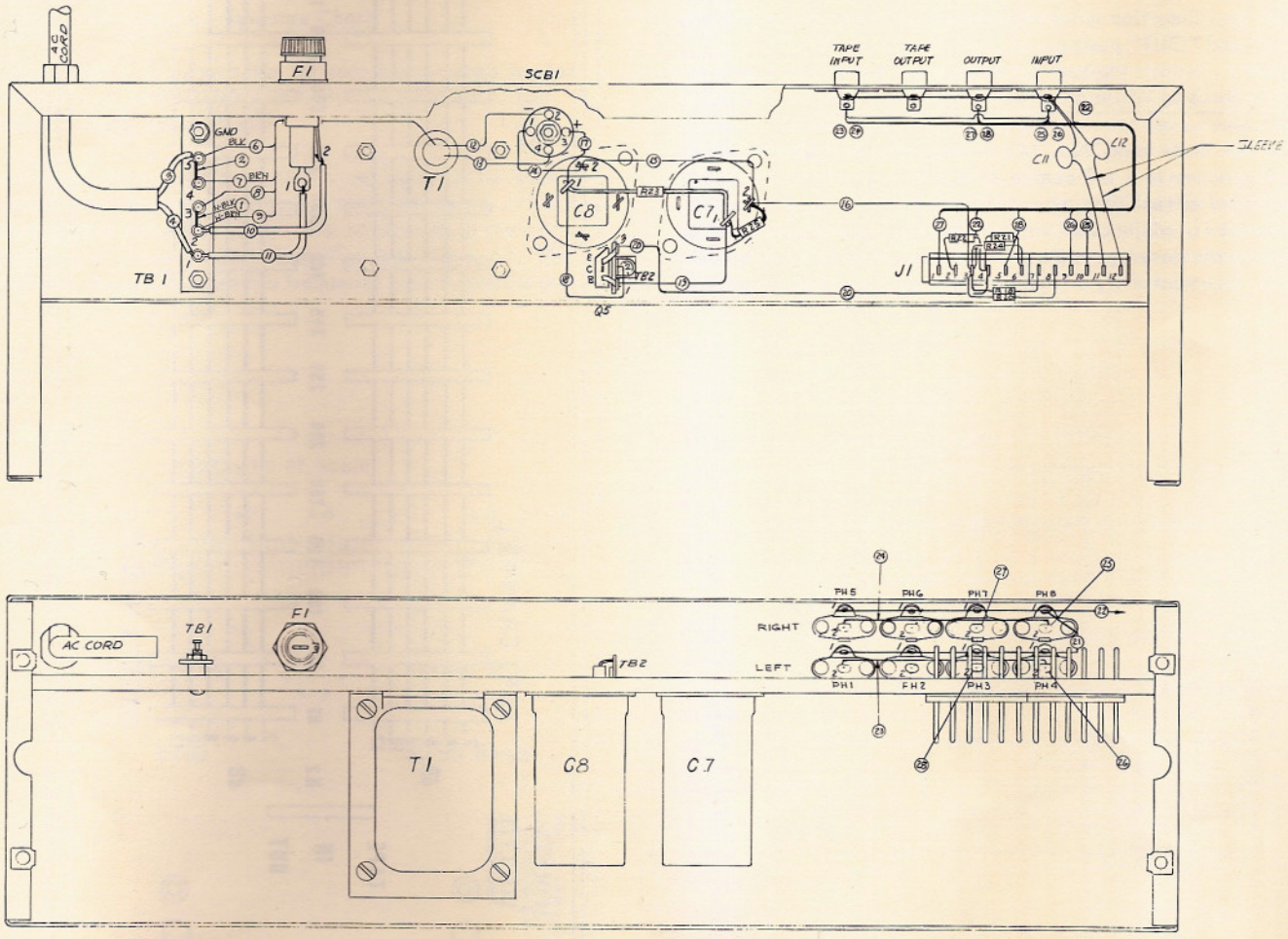


Figure 8. Wiring Diagram (2D488-3)

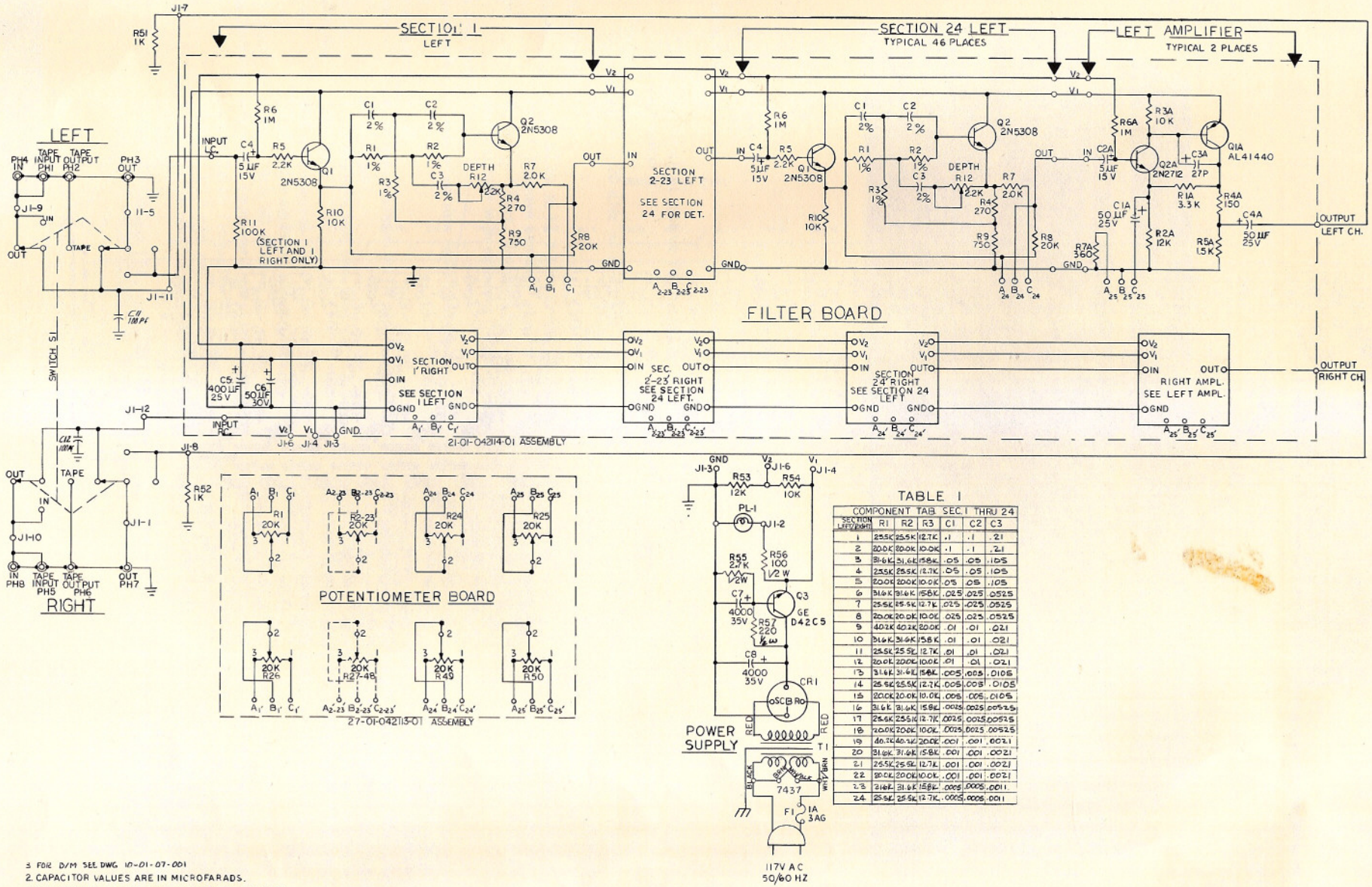


TABLE I

COMPONENT TAB. SEC. 1 THRU 24

SECTION LEFT/RIGHT	R1	R2	R3	C1	C2	C3
1	25.5K	25.5K	12.7K	.1	.1	.21
2	20.0K	20.0K	10.0K	.1	.1	.21
3	31.6K	31.6K	15.8K	.05	.05	.105
4	25.5K	25.5K	12.7K	.05	.05	.105
5	20.0K	20.0K	10.0K	.05	.05	.105
6	31.6K	31.6K	15.8K	.025	.025	.0525
7	25.5K	25.5K	12.7K	.025	.025	.0525
8	20.0K	20.0K	10.0K	.025	.025	.0525
9	40.2K	40.2K	20.0K	.01	.01	.021
10	31.6K	31.6K	15.8K	.01	.01	.021
11	25.5K	25.5K	12.7K	.01	.01	.021
12	20.0K	20.0K	10.0K	.01	.01	.021
13	31.6K	31.6K	15.8K	.005	.005	.0105
14	25.5K	25.5K	12.7K	.005	.005	.0105
15	20.0K	20.0K	10.0K	.005	.005	.0105
16	31.6K	31.6K	15.8K	.0025	.0025	.00525
17	25.5K	25.5K	12.7K	.0025	.0025	.00525
18	20.0K	20.0K	10.0K	.0025	.0025	.00525
19	40.2K	40.2K	20.0K	.001	.001	.0021
20	31.6K	31.6K	15.8K	.001	.001	.0021
21	25.5K	25.5K	12.7K	.001	.001	.0021
22	20.0K	20.0K	10.0K	.001	.001	.0021
23	21.6K	31.6K	15.8K	.0005	.0005	.0011
24	25.5K	25.5K	12.7K	.0005	.0005	.0011

3. FOR D/M SEE DWG. 10-01-07-001
2. CAPACITOR VALUES ARE IN MICROFARADS.
1. RESISTOR VALUES ARE IN OHMS ±10% - 1/4 WATTS.

NOTES: UNLESS OTHERWISE INDICATED.

Figure 9. Schematic (2D483-4), 729A Acousta-Voicette Stereo Equalizer

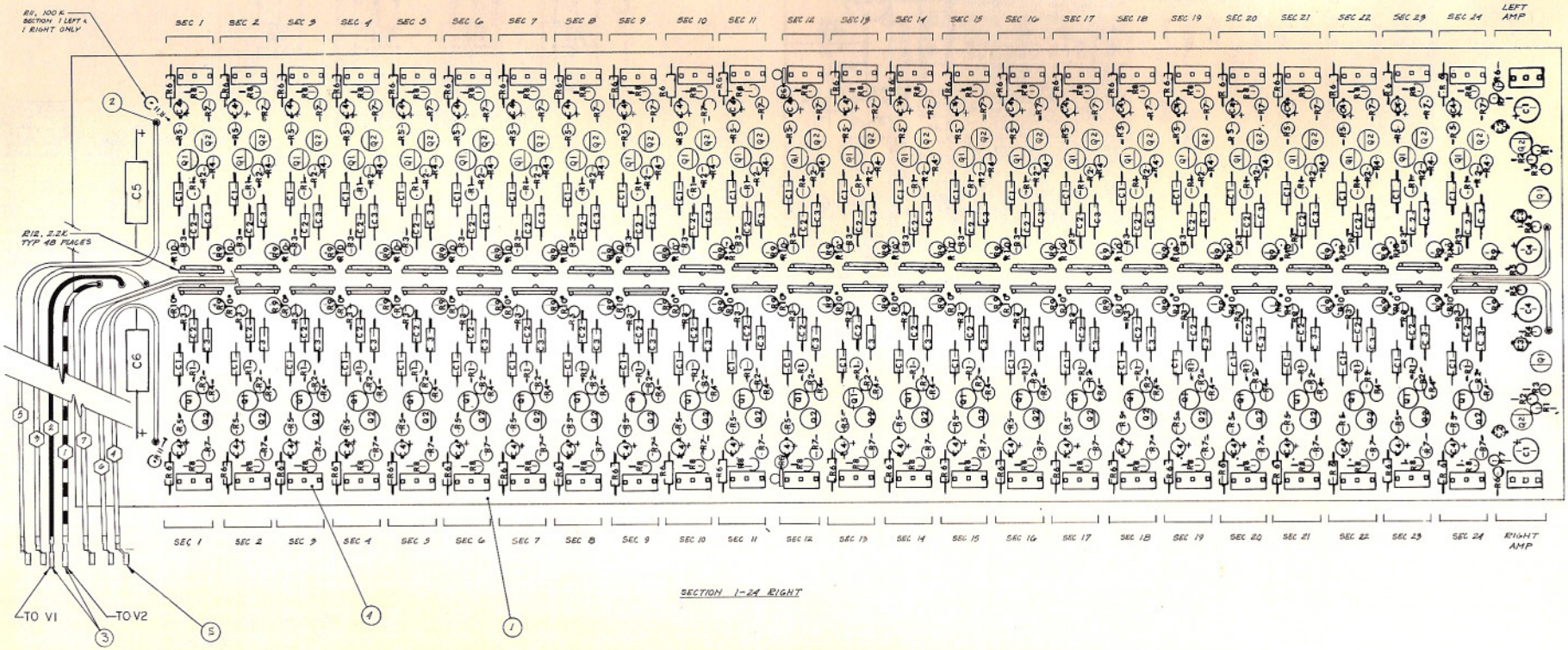
TABLE 1						
COMPONENT TAB. SEC. 1 THRU 24						
SECTION LEFT/RIGHT	R1	R2	R3	C1	C2	C3
1	25.5K	25.5K	12.7K	.1	.1	.21
2	20.0K	20.0K	10.0K	.1	.1	.21
3	31.6K	31.6K	15.8K	.05	.05	.105
4	25.5K	25.5K	12.7K	.05	.05	.105
5	20.0K	20.0K	10.0K	.05	.05	.105
6	31.6K	31.6K	15.8K	.025	.025	.0525
7	25.5K	25.5K	12.7K	.025	.025	.0525
8	20.0K	20.0K	10.0K	.025	.025	.0525
9	40.2K	40.2K	20.0K	.01	.01	.021
10	31.6K	31.6K	15.8K	.01	.01	.021
11	25.5K	25.5K	12.7K	.01	.01	.021
12	20.0K	20.0K	10.0K	.01	.01	.021

TABLE 1						
COMPONENT TAB. SEC. 1 THRU 24						
SECTION LEFT/RIGHT	R1	R2	R3	C1	C2	C3
13	31.6K	31.6K	15.8K	.005	.005	.0105
14	25.5K	25.5K	12.7K	.005	.005	.0105
15	20.0K	20.0K	10.0K	.005	.005	.0105
16	31.6K	31.6K	15.8K	.0025	.0025	.00525
17	25.5K	25.5K	12.7K	.0025	.0025	.00525
18	20.0K	20.0K	10.0K	.0025	.0025	.00525
19	40.2K	40.2K	20.0K	.001	.001	.0021
20	31.6K	31.6K	15.8K	.001	.001	.0021
21	25.5K	25.5K	12.7K	.001	.001	.0021
22	20.0K	20.0K	10.0K	.001	.001	.0021
23	31.6K	31.6K	15.8K	.0005	.0005	.0011
24	25.5K	25.5K	12.7K	.0005	.0005	.0011

TABLE 2		
	SECTION 1-24	LEFT & RIGHT AMP
R1	SEE TABLE 1	3.3K
R2	SEE TABLE 1	12 K
R3	SEE TABLE 1	10K
R4	270	330
R5	2.2 K	2.7K
R6	1 M	1 M
R7	2.0 K	360
R8	20 K	—
R9	750	—
R10	10 K	—
R11	100 K	SEE NOTE BELOW
R12	2.2 K TYP.	—
C1A		50 MF
C2A		5 MF

TABLE 2		
	SECTION 1-24	LEFT/RIGHT AMP
C3A		27 PF
C4	3 MF	50 MF
C5	400MF	
C6	50 MF	
Q1	2N5308	
Q2	2N5308	
C4A	———	50 MF
Q1A	———	AL41440
Q2A	———	2N2712

SEC 1 ~ 24 LEFT



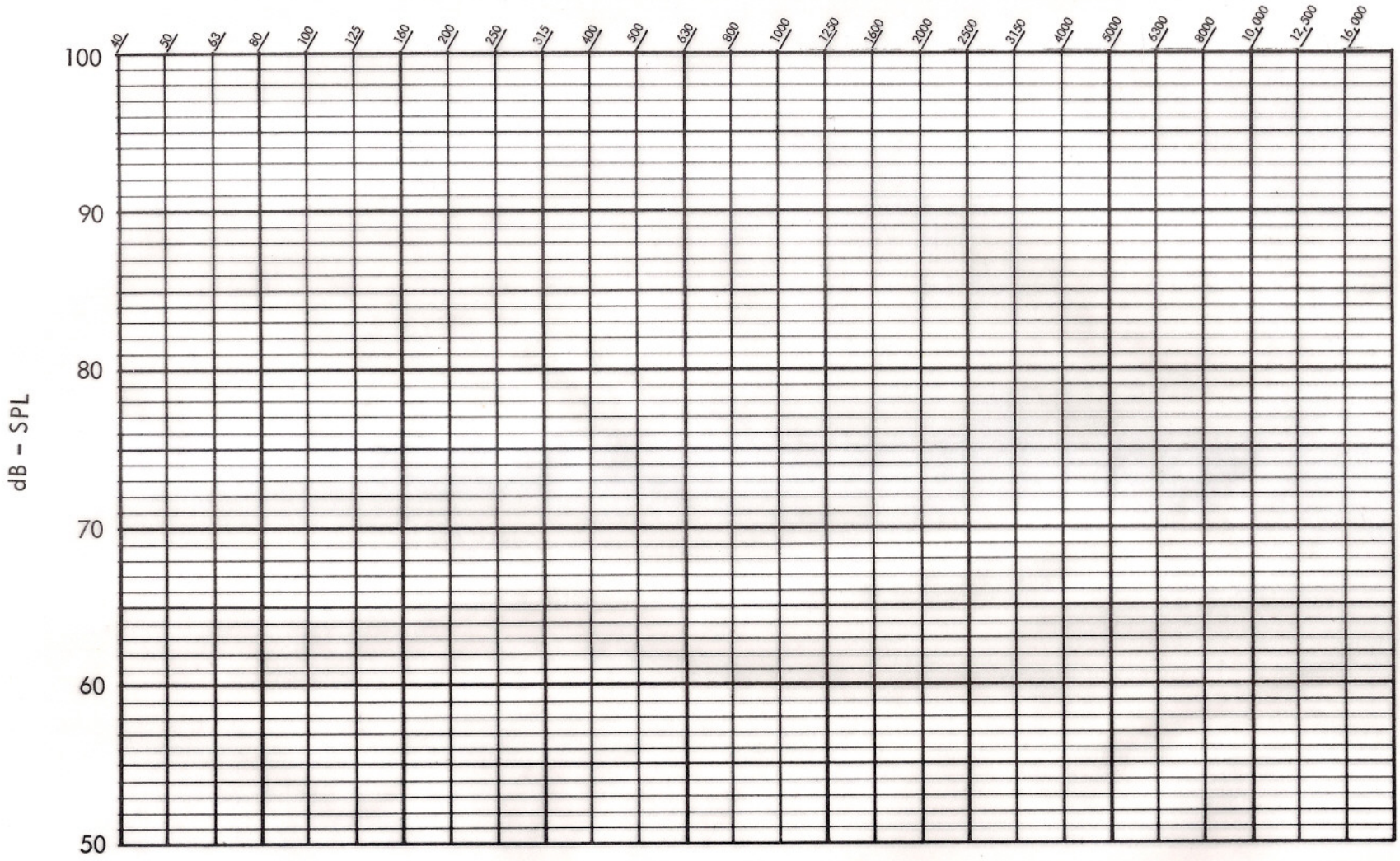
SECTION 1-24 RIGHT

WIRE NO.	COLOR	FROM	TO	GAGE	LGTH	REMARKS
7	GRN/WHT	LEFT OUTPUT		22GA		
6	GRN	RIGHT OUTPUT		22GA		
5	YEL/WHT	LEFT INPUT		22GA		
4	YEL	RIGHT INPUT		22GA		
3	BLK	GND		22GA		
2	RED	V-1		22GA		
1	RED/WHT	V-2		22GA		

WIRE CHART

Figure 10. Electronics Parts Locations (2D490-2) Filter PCB Assembly

FREQUENCY IN HERTZ



ALTEC ACOUSTA-VOICING RESPONSE CHART

DEALER NAME _____

DATE _____

CHANNEL _____

ALTEC
SOUND PRODUCTS DIVISION

AL-1035-1
42-02-110022-01 Litho in USA CP-973-5K