



Model 53-5333
CROSSOVER CARD

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Setting Frequency on the 53-5333 Crossover Card

1. The Card is shipped pre-set to the crossover frequency of 800 Hz. This is done with an eight-pin single inline resistor network labeled RN1.
2. To change frequencies, replace RN1 with one of the alternate networks supplied in a plastic bag packed with the card. Use the following table:

<u>Frequency</u>	<u>Network Value</u>	<u>Label</u>
80 Hz	1 M Ω	105
120 Hz	680 k Ω	684
500 Hz	150 k Ω	154
800 Hz	100 k Ω	104
1200 Hz	68 k Ω	683
7000 Hz	12 k Ω	123

Note: The resistor networks given in the above table are standard values and in some cases will give slightly different frequencies than shown.

3. To change to another value not listed, use four 1/4 W 1% resistors inserted into adjacent pins of the connector in "hairpin" fashion. Select the resistor values according to the following formula:

$$R = \frac{1}{F \times (12.57 \times 10^{-9})}$$

Setting the 53-5333 Crossover Card for 2360 Series and 2380 Series Horn EQ

1. Referring to the component layout diagram, locate the jumper (R49) that shorts across R9. Leave this jumper in place for flat high frequency response. Remove this jumper to activate the horn equalization.
2. The horn equalization curve is optimized for the JBL 2360 Series Bi-Radial[®] horns, which have uniform frequency response across their rated coverage angles down to 500 Hz. The JBL 2380 Series Bi-Radial horns, which have considerably smaller mouths, lose some vertical pattern control when operated down to 500 Hz, and, consequently, will exhibit a small dip in their frequency response in this region across their rated coverage angles. In critical applications, this can be corrected with an external equalizer.

Delay Setting on the 53-5333 Crossover Card

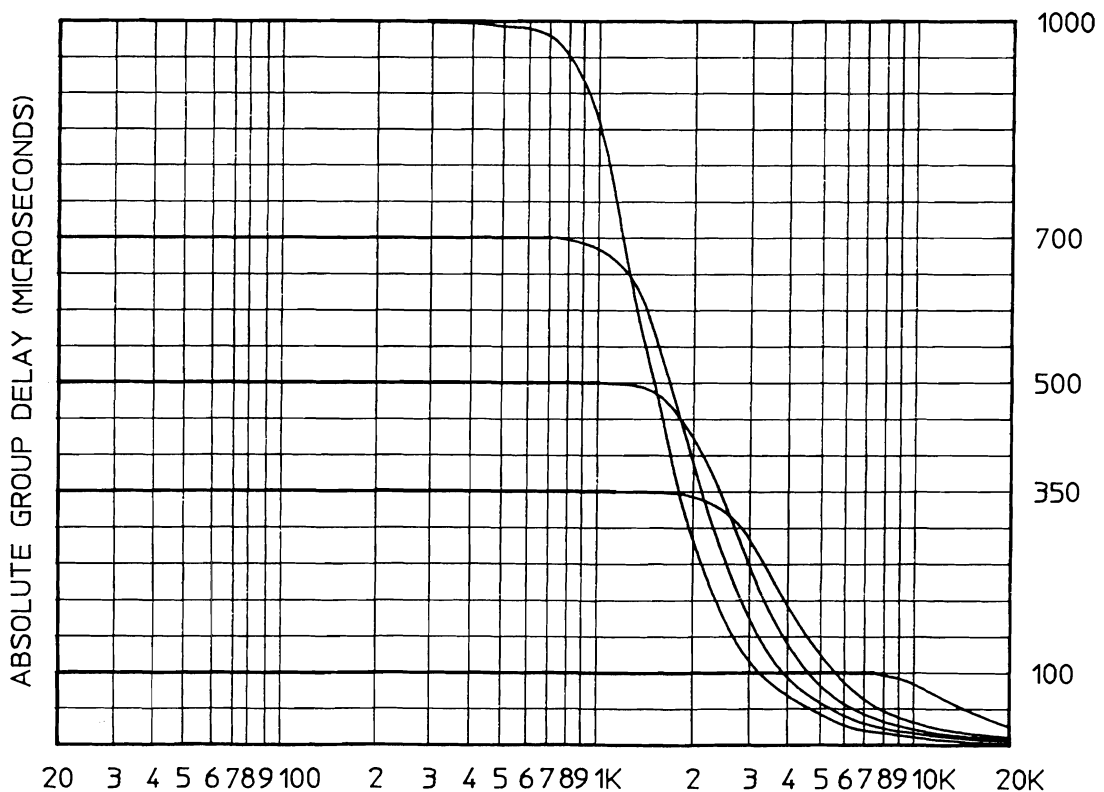
1. The unit is shipped with 700 μ s of delay. This consists of two sections set for 350 μ s each, connected in series. Referring to the delay versus frequency graph, it can be seen that constant delay over frequency varies with the amount of delay chosen. For example, the graph shows typical delay curves for one delay section. At 350 μ s the delay is constant to 1600 Hz, and at 700 μ s the delay is constant to 800 Hz. By connecting two delay sections in series, the total delay is the algebraic sum of both sections. For unequal delay sections, the total range of flat delay will be the narrower of the two sections. By using the above example and referring to the graph, note that connecting two 350 μ s delay sections in series, a total delay of 700 μ s will result, and the delay will be constant to 1600 Hz.
2. To adjust the individual delay sections there are five resistors which must change in value according to the formula $R = K \times \text{Delay (in ms)}$. Each of the five resistor values has a different value of K, selected from the following table:

<u>R</u>	<u>K</u>
R _a	15,843
R _b	17,268
R _c	11,890
R _d	39,730
R _e	23,780

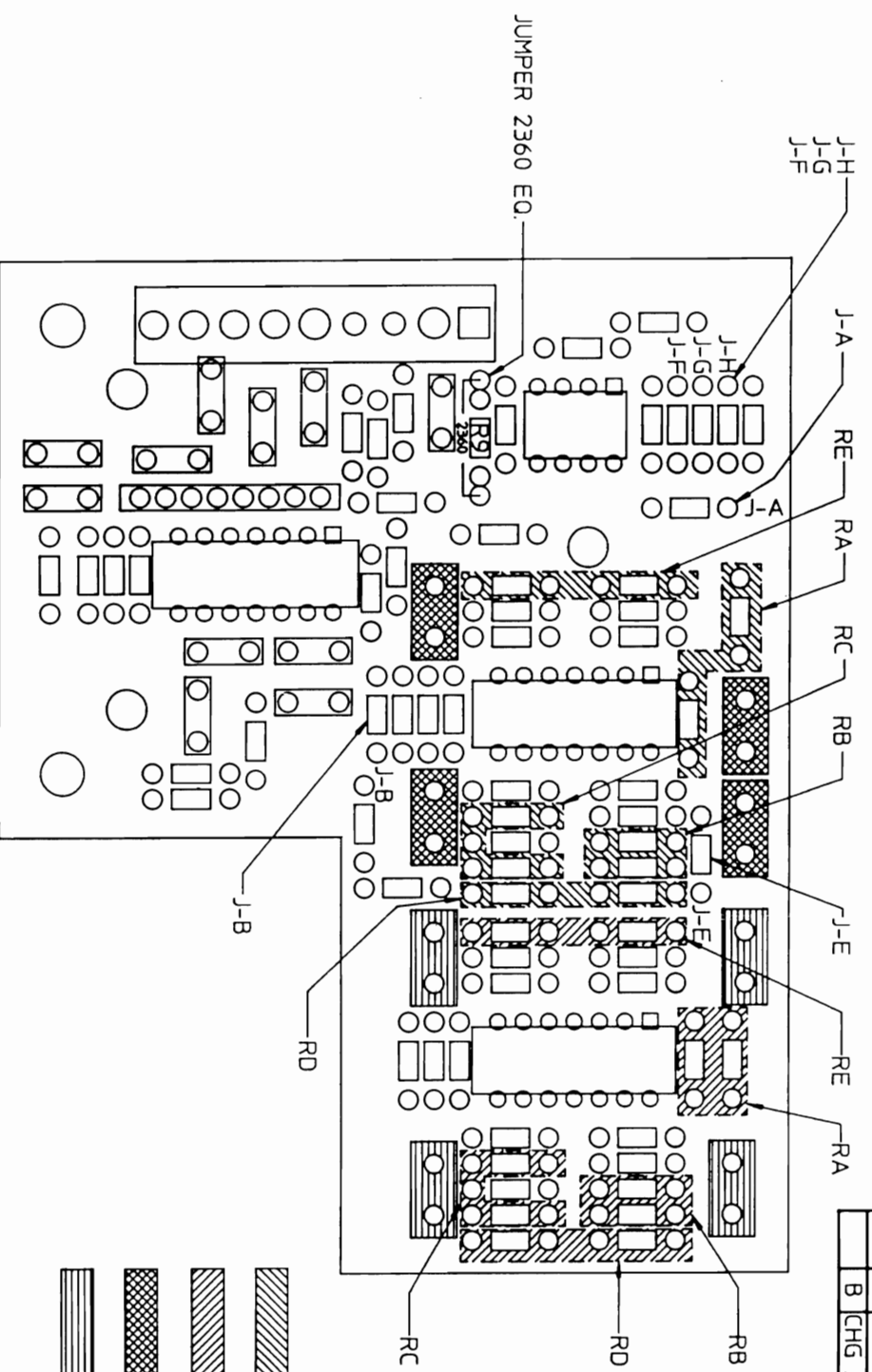
For a 350 μ s delay, R_a is calculated as $.35 \times 15,843 = 5545 \Omega$. Please note that the PC board is laid out so that R_a can be made of two resistors in series if the value is not a standard 1% resistor value. The unit as shipped uses a 5.49 k Ω plus a 53.6 Ω resistor to equal 5544.6 Ω .


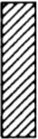


- For delays shorter than 100 μ s, change the four .01 μ F capacitors circled on the schematic and highlighted on the component placement diagram. For example, selecting R_a = 1,584 Ω , R_b = 1,727 Ω , R_c = 1,189 Ω , R_d = 5,677 Ω and R_e = 2,378 Ω , the delay will be 100 μ s with four .01 μ F value capacitors in place. By making the four capacitors an order of magnitude smaller (.001 μ F), the delay will become an order of magnitude shorter (10 μ S). Be sure all four capacitor values are the same. One percent film type capacitors are preferred.
- If zero delay is desired, be sure jumpers G and H are removed and jumper F is installed. Also be careful not to tie two or more outputs together by improperly installing jumpers. Please refer to the schematic for proper signal routing.

Delay vs. Frequency for One Delay Section



REVISIONS				
DOC	REV	DESCRIPTION	DATE	APPROVED
	A	REL FOR MANUAL	6/15/90	
	B	CHG JUMPER 2380 IS 2360	7/5/90	<i>[Signature]</i>



-  RESISTOR DELAY SECTION # 1
-  RESISTOR DELAY SECTION # 2
-  CAPACITOR DELAY SECTION # 1
-  CAPACITOR DELAY SECTION # 2

QTY REQD		PART OR IDENTIFYING NO.		MATERIAL SPECIFICATION	
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:			CONTRACT NO.		
FRACTIONS XX.X DECIMALS .XX ANGLES XXX.X			APPROVALS		
MATERIAL			DRAWN R.E./CAD 6/15/90		
FINISH			CHECKED C.U./EMG 7/1/90		
DO NOT SCALE DRAWING			DATE		
NEXT ASSY USED ON			DATE		
APPLICATION			DATE		
SCALE 2:1			SIZE B		
MODEL NO. 5235			DRAWING NO. 16717		
SHEET 1 OF 1			REV B		
53-5333 COMPONENT PLACEMENT					
UNITED RECORDING ELECTRONICS INDUSTRIES 4400 BALBOA BLVD. DUBLIN, CALIFORNIA 94568					

