

Central Electronics
Model DQ
Q-Multiplier

THEORY:

The "Q" Multiplier is a selectivity device for use with either the Sideband Slicer or any receiver having an IF frequency range from 450 to 500 kcs. Model AQ is intended for use with Model A Sideband Slicer and converts the Slicer to Model B. Model DQ is a Desk Model for use with any receiver in the above IF frequency range.

The unit consists of a high "Q" coil connected in a vacuum tube (6AB4) circuit so that by means of feedback, the effective "Q" of the coil is multiplied many times. This results in a very high "Q" and a very high impedance at resonance. It may be used to increase the IF selectivity in the PEAK position, or else to put a "notch" in the IF passband in the NULL position.

Basically the unit has two separate signal paths; the "Q" channel consisting of the 6AB4 with the triode section of the 6U8, and the second channel consisting of the pentode section of the 6U8.

In the OFF position of the switch, the 6AB4 is disabled and the pentode section of the 6U8 is used as an IF amplifier. With this stage of amplification, the AP-1 is no longer required.

In the PEAK position the pentode functions as a grounded grid IF amplifier for the "Q" channel. With the SELECTIVITY control fully counter-clockwise, some selectivity is added at the frequency to which the "Q" circuit is tuned. Advancing the SELECTIVITY control increases the selectivity until the circuit goes into oscillation. At the point just before oscillation, the bandwidth is only a few cycles. This position is useful for CW, AM, FM and SSB, by using the proper amount of selectivity. Advancing the selectivity control too far on phone reception will result in loss of intelligibility due to the restricted bandwidth. Generally more selectivity can be used on strong and undistorted signals. If a strong heterodyne cannot be reduced sufficiently in the PEAK position, it will be necessary to switch to NULL.

In the NULL position both channels are used. The desired signal and the interfering carrier is applied between grid and cathode of the 6U8 pentode and to the "Q" Multiplier channel. Due to the high order of selectivity obtainable in the "Q" channel, the interfering carrier may be separated from the desired signal by tuning the "Q" circuit. This interfering carrier passes through the triode section of the 6U8 operating as a cathode follower and is cathode coupled to the pentode section. At this point the carrier from the "Q" channel is 180° out of phase, cancelling the interfering carrier in the signal channel.

Q Multiplier
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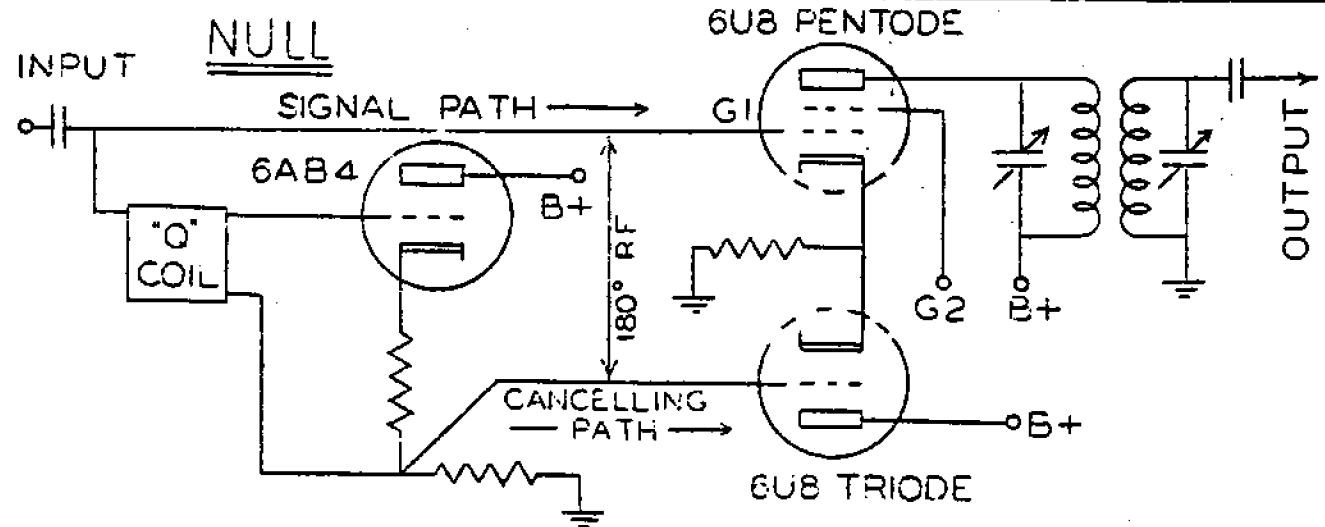
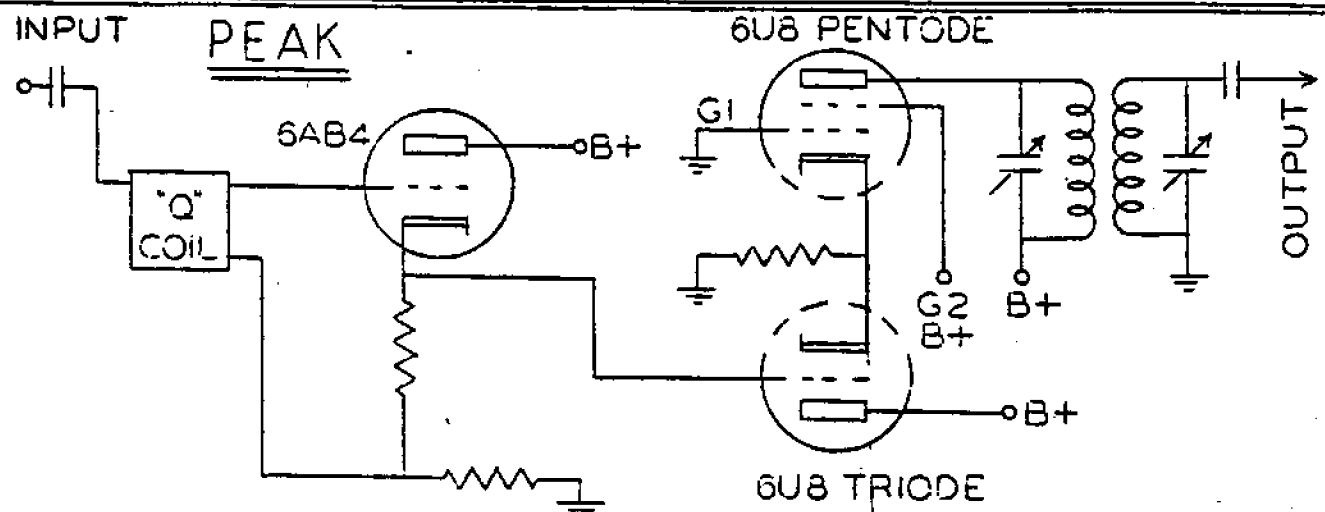
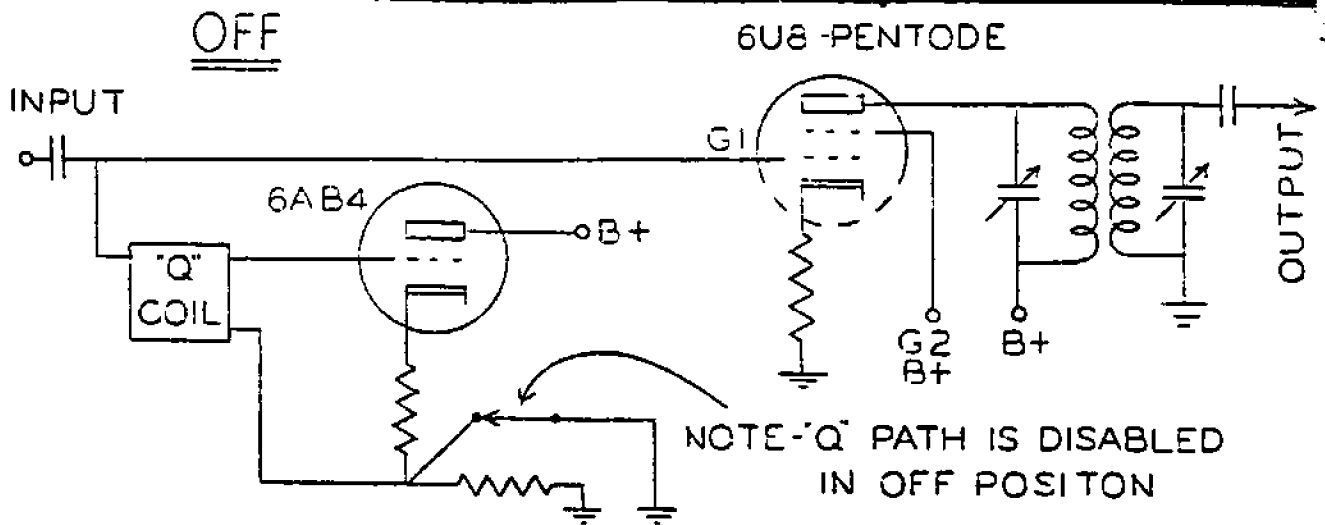
In actual practice, when it is desired to null out an interfering carrier, proceed as follows:

Place the SELECTIVITY control at 50% rotation. Set the switch to NULL. Now tune to the interfering carrier with the TUNING control. The amplitude of the interfering carrier will decrease when the "Q" circuit is resonated. Maximum attenuation is achieved by carefully "rocking" both the SELECTIVITY and TUNING controls.

CAUTION: When attempting to remove an interfering carrier on an AM phone signal (with the receiver in NORMAL reception), be sure to tune the "Q" circuit to the interfering carrier and not to the carrier of the desired signal. Removing either one of the carriers will eliminate the heterodyne, but eliminating the desired carrier will result in severe distortion. This does not apply when the Slicer or EFO are used to reinsert carrier.

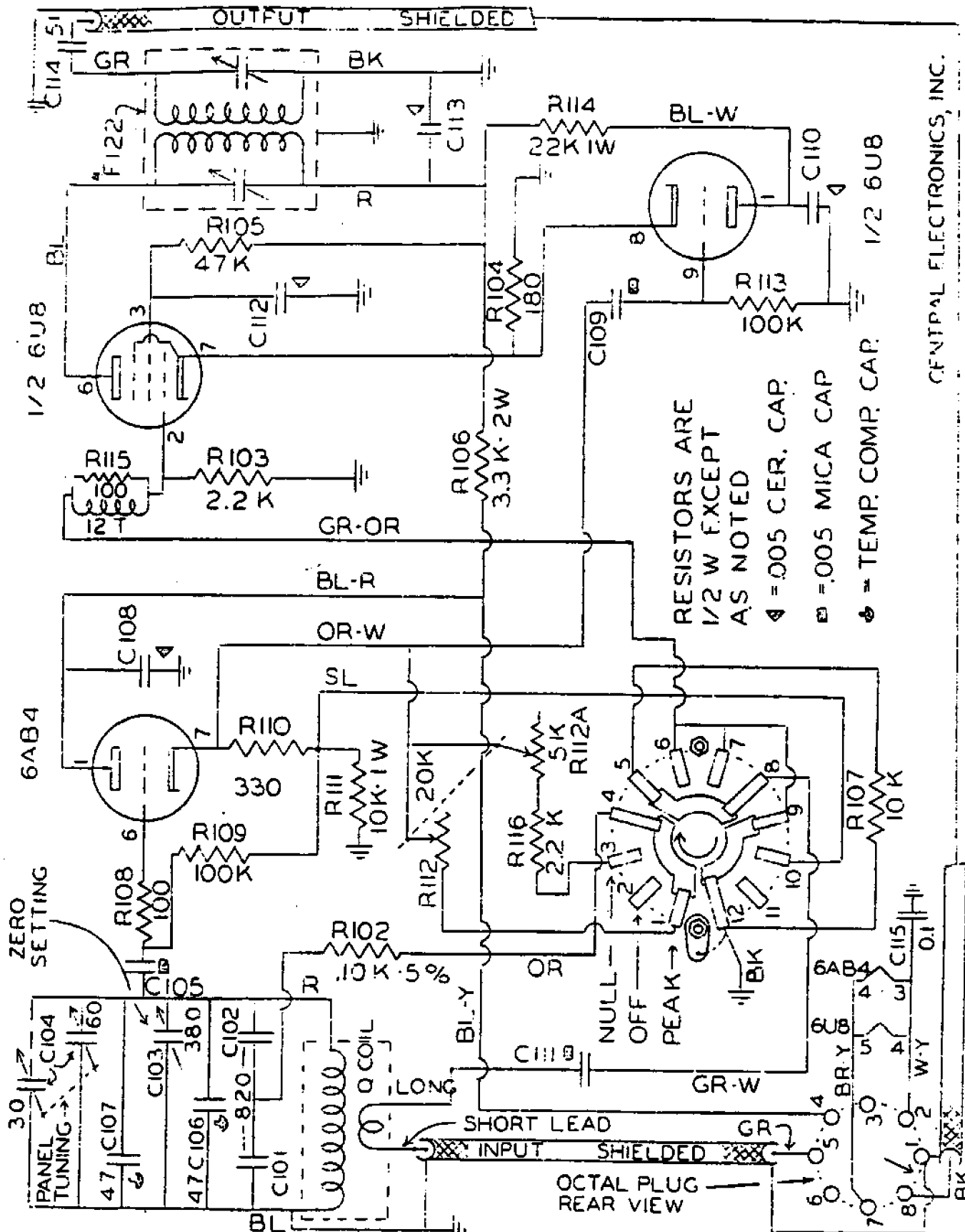
The built "Q" Multipliers are skipped using the 60 mmfd. section only on C104, the TUNING capacitor. With receivers utilizing a mechanical or lattice filter, or other extremely sharp IF system, the stator lead should be changed over to the 30 mmfd. section (3 plates) to obtain greater TUNING bandspread. When older receivers are used which have an IF passband of 20 to 25 kilocycles, both sections of C104 should be wired in parallel in order to cover this range.

SIMPLIFIED "Q" MULTIPLIER SCHEMATIC



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SCHEMATIC
Q MULTIPLIER

FIG. 1

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M131A

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CENTRAL ELECTRONICS, INC.

Q MULTIPLIER

DC VOLTAGES

SELECTIVITY CONTROL FULLY CCW EXCEPT LAST COLUMN

DC VOLTS

TUBE	PIN NO.		OFF	PEAK	NULL	OSC PEAK
6AB4	1	PLATE	235 <small>240</small>	235 <small>240</small>	235 <small>240</small>	235
"	6	GRID	0	46 <small>35</small>	46 <small>35</small>	50
"	7	CATHODE	2.4	52	52	56
6U8	1	PLATE TRIODE	112 <small>106</small>	112 <small>106</small>	112 <small>106</small>	
"	2	GRID #1 PENTODE	0	0	0	
"	3	GRID #2 "	108 <small>127</small>	108 <small>137</small>	108 <small>137</small>	104
"	6	PLATE "	200	200	200	200
"	7	CATHODE "	2.05	2.05	2.05	2.05
"	8	" TRIODE	"	"	"	"
"	9	GRID "	0	0	0	-10 TO -32 *

* DEPENDING ON HOW FAR PAST OSCILLATION POINT
POTENTIOMETER IS SET.

POWERED FROM SLICER AT 117 V LINE. SLICER HAS B+ TO
ACCESSORY SOCKETS BEFORE 1800 Ω RESISTOR.

READINGS TAKEN WITH VTVM, MINUS TO CHASSIS, EXCEPT *

K4XL's **BAMA**

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