



Miller

RADIO PRODUCTS



-Since 1924-

Phone: ADams 3-4294

J. W. MILLER COMPANY

Los Angeles 3, California

5917 South Main Street

FAX: XCM

May 28, 1959

Manufacturers
of
Replacement
Coils

Line Filters

Mr. Grote Reber
National Radio Astronomy Observatory
P. O. Box 2
Green Bank, West Virginia

Line Filter
Chokes

Dear Mr. Reber:

AM Coil
Kits

We have received your letter of the 14th requesting information and assistance in resurrecting ancient radiophonic history. Our assistance though limited may prove useful. It depends on the use you have for these coils.

FM Coil
Kits

We still manufacture untuned radio coils, both for the antenna and radio frequency stage. They are known as #472-UA (antenna) and #472-UT (radio frequency stage). They are used in hi-fi tuners of the tuned radio frequency type whose prototype was the Western Electric 10-A. Page 18 of our new catalog #60, a copy of which is enclosed, describes them. We send a brochure showing how they were used in our #570 hi-fi tuner of 1939.

Industrial
Coils

Diathermy
Chokes

If you had in mind some radio exhibit tracing the early days of radio, then your only recourse is museums or the publications of the '20's. Most of their articles were of the do-it-yourself type. McGraw-Hill had a fine magazine. Radio-Electronics Gernsback Publications is still extant. Perhaps they could help. QST likewise.

I. F.
Transformers

We thank you for your interest in our products and should further questions arise, please feel free to call on us.

I. F.
Trimmers

Very truly yours,

R. F.
Chokes

J. W. MILLER COMPANY

Coil Kits

T. P. Vasilopoulos
T. P. Vasilopoulos,
Sales Engineer

Spectal R. F.
Windings

TPV: jw
Encl.

Miller BAND PASS TUNED RADIO FREQUENCY COIL KIT FOR TRUE FIDELITY

SINCE its introduction some ten years ago, the Miller EL-570 High Fidelity Band Pass Tuner Kit has become accepted as the standard of performance for truly quality radio reception of standard broadcast band programs. The inherently low distortion of the tuned radio frequency circuit with band pass coupled stages and the infinite impedance detector provide faithful amplification and rectification of the carrier wave and amplitude modulated audio frequencies. When used with a high quality audio amplifier and speaker system the resulting reproductions of radio programs will be truly amazing. The selection of the amplifier and speaker system will depend upon individual preferences and, of course, the pocketbook. There are many makes of amplifiers and speakers available and we suggest that you visit your local radio distributor for demonstrations.

and should present no problems to the average radio experimenter or service man. The top and bottom chassis views clearly show the location of all parts and the positions of the wiring.

The alignment of the R.F. circuits of the tuner is a relatively simple procedure and while it would be desirable to use an oscilloscope, it is not essential to do so. The cathode-ray tuning indicator may be used to indicate resonance in making the alignment. When properly aligned, the "eye" shadow angle will remain stationary, with only a slight dip at the center of resonance, while tuning through approximately 20 KC. Greater variation of the shadow angle is an indication of incorrect alignment or may be due to the low frequency peak of one band-pass stage being aligned to coincide to the high frequency peak of the other band-pass stage. Such misalignment would show two dips and three peaks when tuning through resonance, as well as decreased gain and increased band width. The R.F. coils are held to very close inductance tolerances, and unless the physical lay-out has been altered from that specified, the only balancing necessary will be the adjustment of the high frequency trimmers on the variable condenser at about 1100 KC. Should any further slight alignment be necessary throughout the band, it may be done by bending the split rotor plates of the variable condenser.

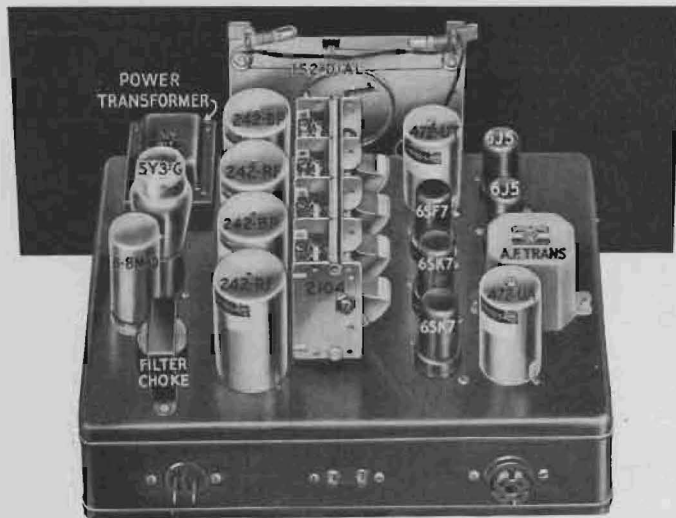
An antenna of from 40 to 60 feet in length will be satisfactory for all normal installations, in metropolitan areas. If a doublet antenna system is used, it will be necessary to include the line-to-receiver transformer, due to the construction of the untuned antenna auto-transformer of the tuner. Most doublet antenna systems are provided with such a matching transformer.

If the tuner is to be used in or near a broadcast transmitter, it is recommended that the entire unit be enclosed in a suitable metal case to prevent signal energy from getting directly into the detector circuit through the exposed RF wiring. A line filter, such as the Miller No. 7818 or one constructed of two type No. 7825 chokes and two .1 mfd. condensers, connected in the primary circuit of the power transformer will effectively prevent signal energy from entering the tuner, RF and audio circuits through pick-up from the AC line.

Do not expect to separate stations operating within 10 or 20 KC of each other, as the over-all flat-top selectivity of the tuner is approximately 20 KC. The side slope of the resonance curve is quite steep (see Figure 1, an untouched oscilloscope photograph) and no interference will be obtained from local stations operating within 30 or 40 kilocycles of each other.

The EL-58 filter shown in the detector load circuit consists of a parallel resonant circuit, using a laminated iron core coil and a variable mica-dielectric trimmer, which is adjustable from the top of the shield. This filter is normally adjusted to 10,000 cycles and is useful in preventing "monkey chatter" from adjacent channel transmitters.

Since the chassis is finished in baked black enamel, all parts should be attached using lock washers under the bolts to insure



Reception of high fidelity programs is satisfactory only from local stations and therefore it is not necessary that the high fidelity receiver possess a high degree of sensitivity. The inherent receiver noises should be kept as low as possible, a requirement which seems best met by the T.R.F. circuit rather than the superheterodyne circuit. The T.R.F. circuit has the further advantage of being much simpler in construction and in maintaining correct adjustment over longer periods of time. Experiments have shown that a flat-top band width of approximately 20 kilocycles is satisfactory. The resonance curve should have a very steep slope in order to avoid interference from stations operating on nearby channels.

The band-pass and radio frequency coils are Litz wire-wound high "Q" type and have been selected to provide the necessary steep side-slope resonance curve. The correct band-width of approximately 20 KC is obtained by means of the negative-mutual coupling coils and the by-pass condensers and resistors in the grid return circuits. If the capacity of the condensers in the coupling circuits is decreased, the result will be a dip in the center of the resonance curve, with a wider over-all response. If the condensers in the coupling circuits are increased the overall response will be lessened. The design of the radio frequency components is such as to give an essentially uniform sensitivity throughout the tuning range of 540 to 1500 KC. The actual frequency range of the tuner is from 335 to 1800 KC. Any substitution of parts in the radio frequency circuit may seriously impair the performance of the tuner. The construction and alignment of the Miller EL-570 tuner is quite simple

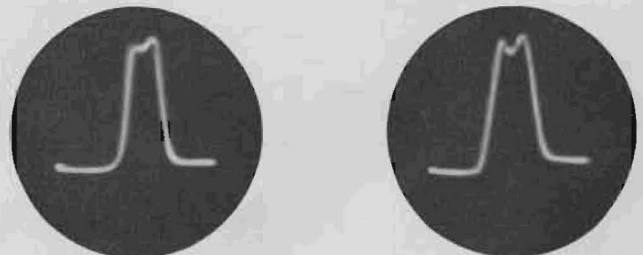


Figure 1

1400 KC
Band Width 20 KC

600 KC
Band Width 23 KC

a good ground connection. Connections to the chassis should be made with solder lugs and lock washers which will cut through the paint and into the steel of the chassis. Screen-grid and cathode by-pass condensers are connected directly to the socket terminals. The band-pass and "B plus" by-pass condensers are connected directly to the coil terminals. Since the resistor board is attached over the underside of the RF tube sockets, short leads are first soldered to the screen-grid and cathode terminals of the tube sockets and then wired to the terminals of the resistor board. The resistor board should be assembled before attaching to the chassis. The plate leads to the 242-RF coils and the antenna lead from the antenna binding post to the 472-UA coil should be wired using low capacity shielded wire. Carefully checking all wiring and solder connections as the work progresses will avoid the necessity of finding and correcting errors after the wiring has been completed.

In many installations it will not be necessary to use the audio amplifier stage and tube-to-line transformer. Low capacity shielded audio cable may be used between the tuner audio volume control and the phono or radio input jack of the audio amplifier.

THE MILLER HIGH FIDELITY COIL KIT INCLUDES THE FOLLOWING:

472-UA	1	Untuned Antenna Coil	\$ 1.75
242-RF	2	R.F. Coils	3.00
242-BP	2	Band-Pass Coils	2.50
472-UT	1	Untuned R.F. Coil	2.25
EL-56	2	Mutual Coupling Coils	2.00
EL-58	1	10 KC Audio Filter	6.00
2104	1	4-Gang Tuning Condenser	15.00
570-CD	1	Circuit Diagram, Data	.25
≡EL-570 KIT			TOTAL LIST PRICE \$32.75

A FOUNDATION KIT OF BASIC PARTS IS AVAILABLE AS FOLLOWS:

EL-570	1	Coil Kit	\$32.75
570-T	1	Tuner Chassis	12.00
570-TB	1	Chassis Bottom	3.00
152	1	Slide Rule Dial	6.00
570-P2	1	Relay Rack Panel	6.00
440	1	Terminal Plate	.50
3093	1	Dial Knob	.75
570-EP	1	pr. Engraved Control Plates	4.00
≡EL-575 KIT			TOTAL LIST PRICE \$65.00

Additional parts required to construct the Miller tuner may be of any standard make and will be available through your radio supply house. The following lists are for your guidance:

RESISTORS

1	20,000 ohm, 2-watt	3	1000 ohm, 1/2-watt
1	15,000 ohm, 2-watt	3	1000 ohm, 1/2-watt 50m
1	20,000 ohm, 1-watt	1	10,000 ohm, 1/2-watt
1	40,000 ohm, 1-watt	1	20,000 ohm, 1/2-watt
1	2500 ohm, 1-watt	1	100,000 ohm, 1/2-watt
3	300 ohm, 1/2-watt	1	500,000 ohm, 1/2-watt
		1	1 Megohm, 1/2-watt

CONDENSERS

1	150V 8-8 Mfd. Electrolytic	13	.1 Mfd. 600V Tubular
1	25V 25 Mfd. Electrolytic	4	.05 Mfd. 600V Tubular
1	150V 8-8 Mfd. Electrolytic	4	.0001 Mfd. 500V Mica
		1	.00005 Mfd. 500V Mica

CONTROLS AND SWITCHES

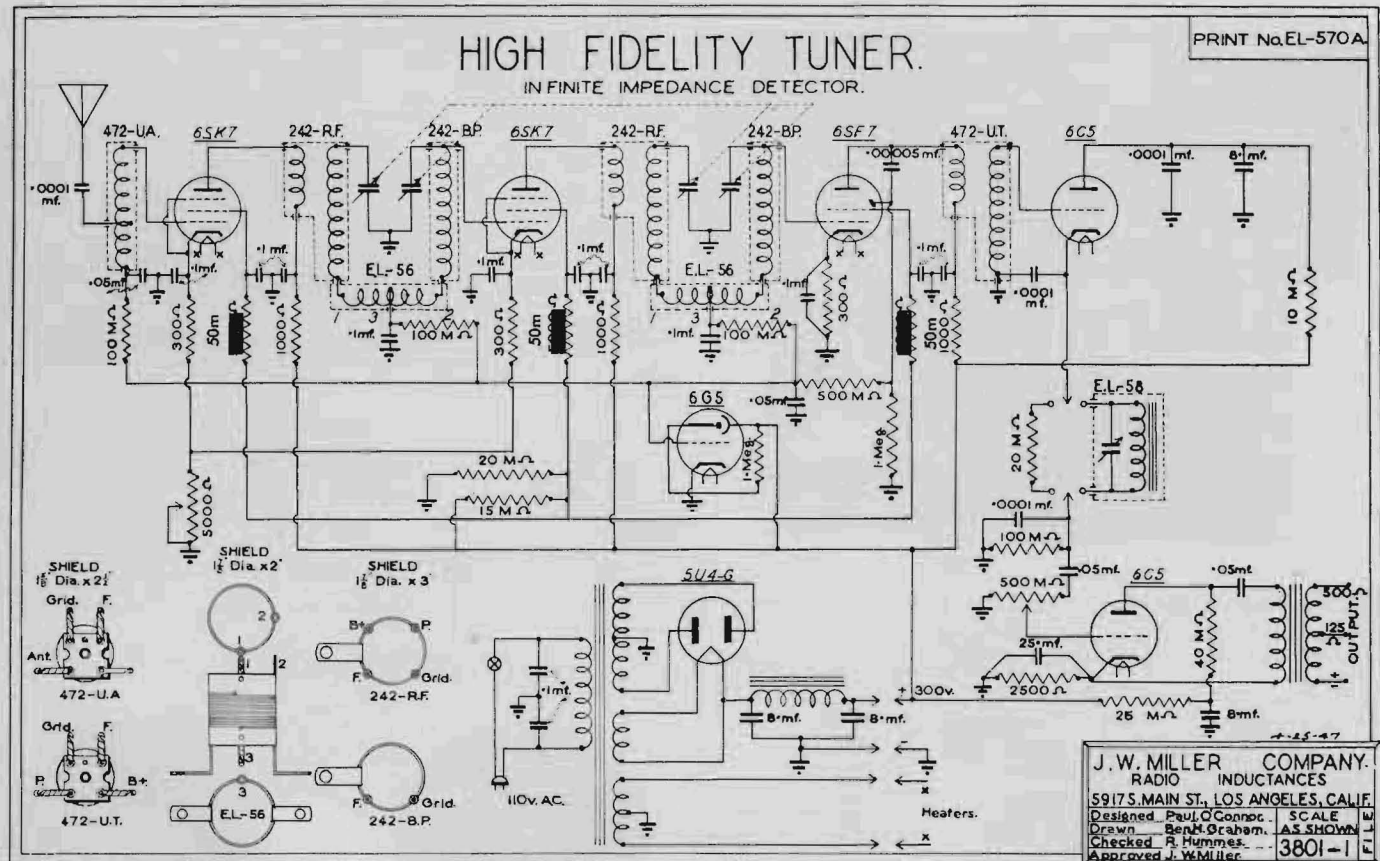
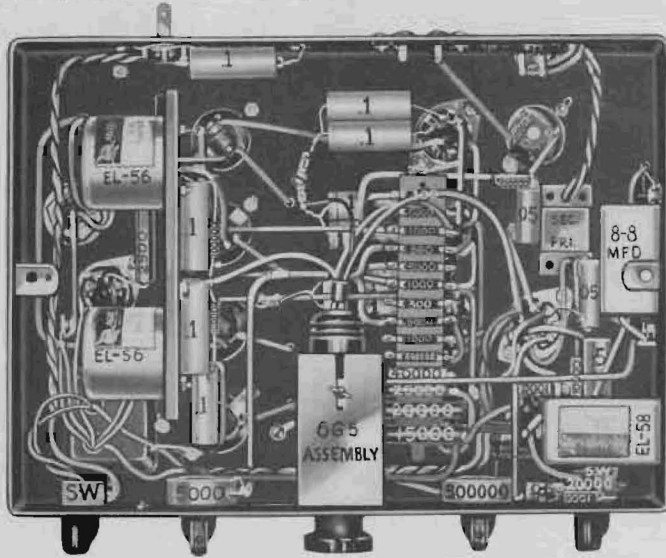
1	500,000 ohm Audio Potentiometer	1	SPST Rotary Type
1	5000 ohm Gain Potentiometer	1	DPDT Rotary Type

TUBES AND SOCKETS

2	Type 6SK7	1	Type 5U4G
2	Type 6C5	1	Tuning Eye Socket Assembly
1	Type 6SF7	7	Octal Sockets
1	Type 6G5	1	AC Receptacle and Plug

TRANSFORMERS

1	Power Transformer
	Primary 117V 60C. Secondary #1 125/175V CT .040/.060A.
	Secondary #2 5V 2A. Secondary #3 6.3V CT 3A.
1	Filter Choke
	10 to 20H 40 to 60MA approx. 300 ohms
1	Audio Transformer
	10,000 ohm Plate to 125/500 ohm Line.



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