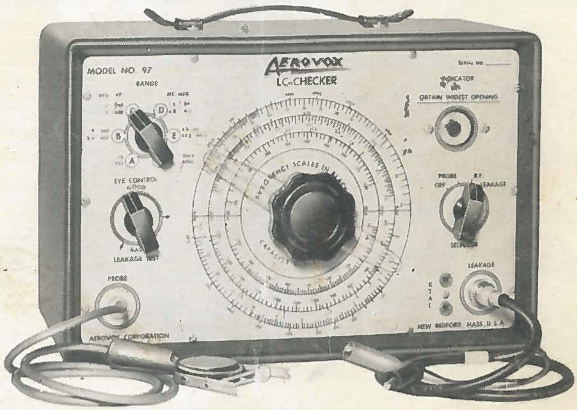
AEROVOX

LC CHECKER

INSTRUCTION MANUAL



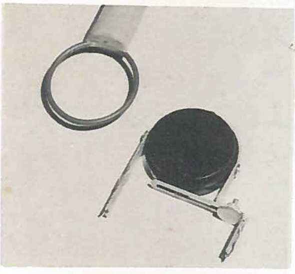
MODEL 97

MECHANICAL AND ELECTRICAL SPECIFICATIONS

Weight: 6½ lbs.
Dimensions: 13" x 8½" x 6"
Power Consumption: 30 watts at 115 volts A.C., 60 cycles
Tube Complement: 1 6C4, 1 6E5, 1 OA2
Capacitance Range: 200 mmfd. to 3.5 mfd.
Frequency Range: 75 KC to 44 MC

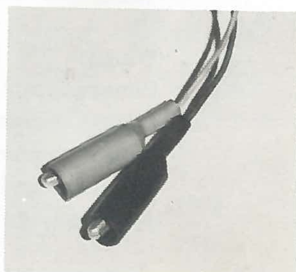
AEROVOX CORPORATION

INDUCTANCE LOOP AND C PROBE ASSEMBLY



C PROBE ASSEMBLED

CLIP CORD



INTRODUCTION

The Aerovox Model 97 LC Checker has been completely re-engineered and designed to afford the operator extreme versatility in use. It incorporates the latest design in printed circuit techniques to ensure maximum efficiency and stability in operation. Its new features include extended frequency ranges for use in most TV work, a voltage regulated power supply for further extreme stability, facilities for the measurement of insulation resistance of capacitor dielectrics, and a plug-in socket arrangement for the inclusion of crystals as precise frequency controls. The equipment is exceptionally easy to operate, (see "General Operating Instructions," and specific additional information in further sections), and can be used for:

1. Measurement of capacity and the relative "Q" of capacitors.
2. Measurement of capacitor insulation resistance.
3. Alignment of R. F. and I. F. circuits in AM, Domestic, Marine, and Short-Wave Receivers.
4. Tracking of super-heterodyne oscillators.
5. Alignment of I. F. channels in FM receivers and independent alignment of the I.F. transformers.
6. Determining resonant absorption points in communications receivers.
7. Location of resonant points in unused portions of coil assemblies in multi-range oscillators.
8. Alignment of Video and Sound I. F. systems in TV receivers.
9. Precise alignment of 4.5 mc intercarrier sound I. F. channels.
10. Determining the natural resonant points of R. F. chokes.
11. Determining the natural period of antennas and transmission lines.
12. Measurement of fundamental crystal frequencies and operation at harmonic levels.
13. Measurement of transmitter buffer, amplifier, and tank circuits for parasitic current loops with power off.
14. Measurement of correct wave trap and filter tuning.
15. Use as a precision standard, crystal controlled signal generator for signal substitution and precise signal sources.

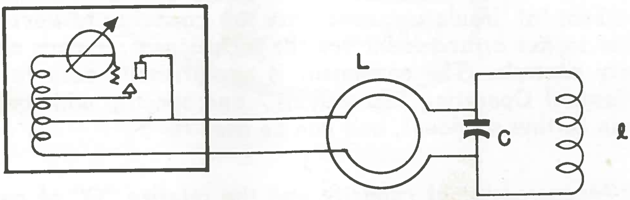
THEORY OF OPERATION

The relationship between the resonant frequency of a circuit and the magnitudes of its inductive and capacitive components is expressed as:

$$f = \frac{1}{2\pi\sqrt{LC}}$$

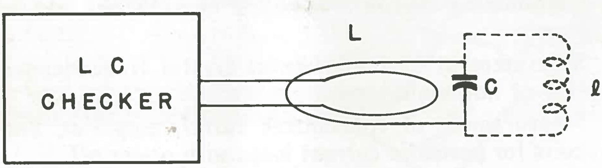
Where: f is the frequency in cycles per second
L is the inductance in henries
C is the capacitance in farads

If two of the three variables in this expression are known, the third may be determined. The Aerovox LC-Checker is an instrument which quickly and conveniently solves this equation to measure an unknown capacitance, inductance or resonant frequency by supplying known values of the other two variables.



$$L \ll \ell \text{ OR } X_C \ll R_e$$

The Checker consists of a highly stable radio frequency oscillator of the modified Hartley type which is accurately calibrated over six ranges covering from 75 kilocycles to 44 megacycles. A 6E5 tuning eye tube is connected to the oscillator circuit in such a manner as to give a very sensitive indication of slight variations in oscillator loading. Coupling to circuits external to the oscillator is provided by a coupling cable, or by a capacitive coupling through a 5 mmfd. capacitor.



$$\ell > L$$

In practice, the LC Checker oscillator is coupled to the resonant circuit being tested by means of the attached probe cable or capacity coupling. When the oscillator is tuned through the unknown resonant frequency of this circuit, radio frequency energy from the oscillator is induced in the circuit. The result of the removal of this energy from the oscillator tank circuit is to reduce the R. F. drive voltage on the grid of the 6C4 oscillator tube and hence its grid current. The "eye" tube then gives a visual indication of this change by opening when the frequency of the circuit being measured is equal to the known frequency of the LC-Oscillator. In this respect, the Checker functions in the same manner as a grid-dip meter, but with considerably extended versatility.

GENERAL OPERATING INSTRUCTIONS

In order to operate the Model 97 LC-Checker to perform any of its functions the following simple steps should be followed:

1. Remove the LC-Checker from its shipping carton.
2. Unwind the AC line cord, probe cord, and clip cord.
3. Plug the line cord into a source of 115 volt A.C., 60 cycle power.
4. Turn the "Selector Switch" (on the middle right-hand side of the panel) to any of the three operating positions, either "Probe," "R. F.," or "Leakage."
5. Allow about 5 minutes warm-up time for the unit to achieve operating stability.
6. Set the operating controls for whatever function you wish to perform and follow the more explicit instructions as outlined in further sections.

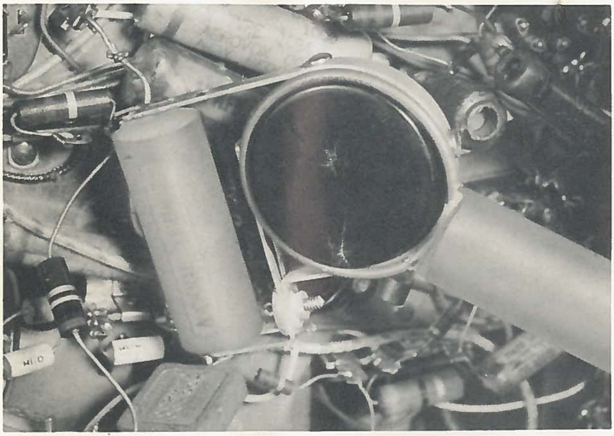
TO MEASURE CAPACITANCE

1. Turn unit on and allow to warm up as outlined in "General Operating Instructions."
2. Turn the "Selector" switch to "Probe" position.
3. Connect the capacitor to be measured to the "C" prod, (this is the flat phosphor bronze strip especially shaped with an adjusting portion and thumb screw so that most common capacitor sizes can be measured). Keep the clip portions of the "C" prod as close to the body of the capacitor to be measured as possible.
4. Adjust the "Eye Control" knob, (on the middle left-hand side of the panel) until the indicating tube pattern just closes. This indicates weak oscillation of the oscillator and is the most sensitive area of operation.

5. The capacity ranges are then explored by turning the "Range" switch (located at the upper left-hand side of the panel) to each position in order and rotating the main tuning dial slowly through its range.
6. At the point of resonance a sudden sharp opening of the eye pattern will occur, and the capacitance can be read directly on the main tuning dial under the magnifying section of the pointer.

NOTE CAREFULLY THAT CAPACITY RANGES ARE MARKED IN RED BOTH ON THE RANGE SWITCH AND MAIN TUNING DIAL AND THESE SHOULD BE USED FOR ALL CAPACITIVE MEASUREMENTS.

The LC-Checker can be used to check paper, mica, ceramic, and air dielectric capacitors. It is unnecessary to disconnect the capacitors from the circuit in which they are employed to permit testing with the LC-Checker since the inductance of the "C" prod is so low that other circuitry connected across the capacitor has little effect on the accuracy of the measurement. For more precise measurement, however, merely unsolder one of the capacitor leads from the circuit.



The nature of the "eye" opening is indicative of the general condition of the capacitor being checked. If the opening is wide and distinct, the unit is of good quality—resulting in a high "Q" resonant circuit. A low "Q" capacitor, on the other hand, will give a sluggish response or none at all. If the unit is open circuited internally, a response may be found, but it will be at a much lower capacity than is normal for a capacitor of that size. If the capacitor is short circuited internally, a response will not normally be found. Units of this kind should be removed and checked by themselves. If the same response is attained then the capacitor should be replaced.

An inductive capacitor, which usually results when only part of the end foils are in contact with the leads, is readily detected with the Checker. Such units give a response which, because of the additional inductance, will be at a capacitor reading considerably higher than the normal resonance for a capacitance of that value. In most applications, especially R. F. by-passing, such units will give unsatisfactory service and should be replaced.

There should be no difficulty in measurement of capacities at or near the ends of the scales since the ranges overlap one another.

To Measure Capacitors Below 200 mmfd

1. Parallel the small capacity capacitor to be tested with one having a larger capacity.
2. Measure the combined value and the value of the large capacitor alone.
3. Subtract the capacity of the large capacitor from that of the combined value to arrive at that of the unknown small capacitor.

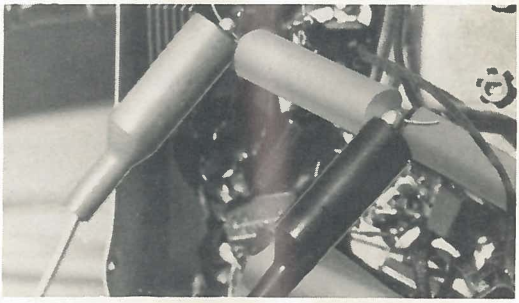
To Measure Capacity Above 3 mfd

1. Connect the large capacity capacitor to be tested in series with another capacitor whose capacity has already been determined (a 1 mfd capacitor is suggested).
2. Measure the combined value of the capacitors.
3. Determine the value of the unknown by the formula

$$\frac{1}{C_1} + \frac{1}{C_2} = \frac{1}{C_T} \quad \text{or}$$

$$\frac{C_1 \times C_2}{C_1 + C_2} = C_T$$

To Measure Capacitor Leakage Resistance



1. Connect the clip cord assembly to the "Leakage" connector at the lower right hand corner of the panel.
2. Disconnect the capacitor from the circuit (one lead only).
3. Turn the "Range" switch (upper left hand side of panel) to Scale "A."
4. Turn the tuning dial over to the extreme right, or left (for clearest indication on tuning eye).
5. Connect the alligator clips of the clip cord to the capacitor.
6. Turn the "Selector" switch to "Leakage" position.

7. Rotate the "Leakage Test" knob (middle left hand side of the panel) from the extreme counter clockwise position in a clockwise direction until the eye just closes.
8. Note the position of the pointer knob on the "Leakage Test" control. If the knob has been advanced into the red portion of the dial, low insulation resistance is indicated and the capacitor should be replaced.

It should be noted that the division between a "good" and "bad" capacitor has been set at 100 megohms since most circuits will operate satisfactorily with capacitors having insulation resistance of 100 megohms or better. Capacitors of 2 mfd. or less having insulation resistances less than 100 megohms show deterioration of the dielectric and should be replaced as part of good preventive servicing.

TO MEASURE INDUCTANCE

1. Connect the unknown coil in parallel with a capacitor of known capacity.
2. Turn the "Selector" switch to "Probe."
3. Unsnap the "C" prod from the wire coupling loop, and drop the loop over the coil to be measured.
4. Adjust the "Eye Control" knob until the indicating pattern just closes.
5. Explore the frequency ranges by turning the "Range" switch to each position in order and rotating the main tuning dial slowly through its range.
6. At the point of resonance a sudden sharp opening of the eye pattern will occur and the frequency can be read directly on the main tuning dial under the magnifying section of the pointer.

   NOTE CAREFULLY THAT FREQUENCY RANGES ARE MARKED IN BLACK BOTH ON THE RANGE SWITCH AND MAIN TUNING DIAL AND THESE SHOULD BE USED FOR ALL INDUCTANCE AND DIRECT FREQUENCY MEASUREMENTS.

   NOTE ALSO THAT SCALES A, B, AND C ARE CALIBRATED IN KILOCYCLES WHILE SCALES D, E, AND F ARE CALIBRATED IN MEGACYCLES.

7. When the resonant point is located, the coupling between the loop and the resonant circuit should be decreased by moving the loop away until the eye opening is barely noticed when the main tuning dial is tuned through the resonant point. This permits the most accurate determination of the resonant frequency point.

If for any reason it is impractical to determine the resonant frequency of the inductance and capacitance combination by use of the coupled loop (for example, shielded coils, or odd shapes) the frequency can be measured by direct coupling. For this method of measurement proceed as follows:

1. Connect the unknown coil as before.
2. Turn the "Selector" switch to "R. F."
3. Connect the clip cord assembly to the "Leakage" connector and connect the red and black alligator clips to the coil and capacitor combination.

4. Proceed with the determination of the resonant frequency as listed above in steps 4 through 6.

Once the resonant point has been determined the inductance of the coil to be measured may be determined by the following formulas:

$$L = \frac{1}{4\pi^2 \; F^2C} \quad \text{Henries (F in cycles, C in farads)}$$

or more simply:

$$L = \frac{25{,}400}{F^2C} \quad \text{Microhenries}$$

Where: F is in megacycles
C is in mmfds.

A specially selected Aerovox .001 mfd. mica capacitor fitted with combination Bakelite binding posts is available for use as the standard capacitor for measuring inductances. This unit is listed as auxiliary equipment in the parts list on the inside back cover of this booklet. On page 17 is a rapid conversion chart on which inductance is plotted versus frequency when the standard .001 mfd. capacitor is used. If it is desired to use another value of capacitance, another calibration line may be plotted by computing two points using that value of capacitance in the second equation above and drawing a straight line through them.

A more precise measurement of the inductance of a coil may be made by checking the frequencies at which it resonates with two capacitors of different value. This method gives the geometric inductance of the coil as expressed by:

$$L = \frac{1}{4\pi^2 (C_1 - C_2)} \left(\frac{1}{F_1^2} - \frac{1}{F_2^2} \right) \quad \text{Henries}$$

When C is in farads and F is in cycles per second

The distributed capacity of the coil may also be determined by this measurement. In the same units as in the equation above, the distributed capacitance is given as:

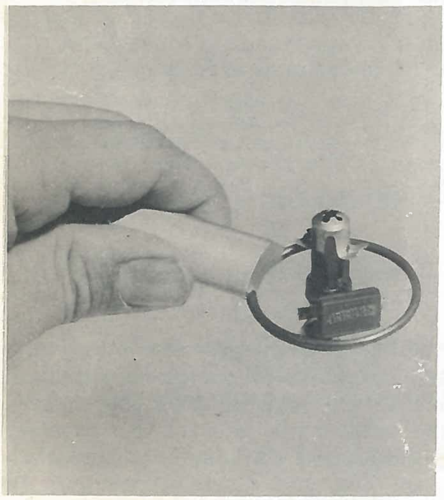
$$C_0 = \frac{C_1 F_1^2 - C_2 F_2^2}{F_2^2 - F_2^2}$$

MEASUREMENT OF RESONANT FREQUENCIES

To Measure Resonant Frequencies of R. F. Choke Coils

Since the impedance of a radio-frequency choke coil depends on the frequency, the maximum frequency at which a choke coil can be operated is of great importance. The fundamental frequency of any radio frequency choke can be found by coupling to the choke coil by means of the loop. Many resonance points may be found, so that the entire frequency range must be covered to determine the lowest resonant frequency of the choke coil. By checking the resonant frequency of the choke coils as connected in a circuit, causes for weak reception of oscillations can be found

To Measure the Resonant Frequency of Tuned Circuits



1. Couple the tuned circuit, the resonant frequency of which is to be determined, to the LC Checker by the use of either the probe cord or the clip cord (see section on "Measurement of Inductance" for instructions as to how this is done). For resonant circuits, which are impractical to remove from associated circuitry, the black alligator clip should be connected to the grounded side of the inductor-capacitor combination and the red alligator clip should be connected to the "High" or ungrounded side.

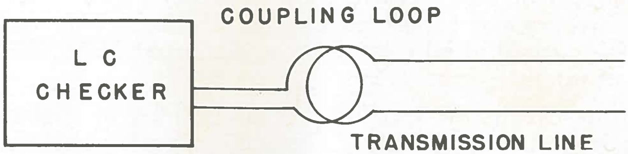
NOTE ALL VOLTAGES SHOULD BE REMOVED FROM THE UNIT UNDER TEST

2. Proceed with the determination of the resonant frequency as outlined in the section entitled "To Measure Inductance."
3. For more precise measurement a small capacitor (2-5 mmfd.) can be connected in series with the red alligator clip and the circuit.

Determining Resonant Frequencies of Antennas

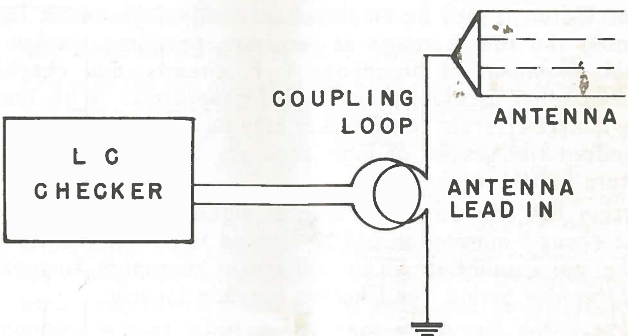
The natural resonant frequencies of circuits having distributed inductance and capacity, as well as those having lumped constants as discussed above, are readily located with the Checker. This permits its use in finding resonances in transmission line and antenna structures.

The electrical length of a transmission line is found by connecting the Checker to one end of the line by means of a wire loop coupled to the Checker loop. If the far end of the line is left open, a resonance will be found at each frequency for which the line is a multiple of quarter wave length long.



The lowest frequency at which the eye opens is the primary resonance of the line. (One quarter wave length). This information is useful in cutting tuned feeders for antennas and in measuring the velocity factor of a transmission line. This factor is equal to the ratio of the length of the line for quarter wave resonance to the length of a quarter wave length in free space at the same frequency.

In a similar manner, the resonance points of an antenna may be located by coupling the Checker by loop or capacitive coupling to the feed point of the antenna and exploring the ranges for eye openings.



For such devices, which have inherently low Q, searching must be done very carefully and with the eye control set on the verge of opening, since the response may be slight. A response will usually be found at each harmonic frequency of the antenna, as well as at the fundamental frequency.

To Determine Fundamental Frequencies of Crystals

1. Turn "Selector" switch to "R. F." position.
2. Connect the crystal to the black and red alligator clips on the clip cord.
3. Explore for the resonant frequency as outlined in section entitled "To Measure Inductance." The eye opening will be extremely sharp.

With some crystal units, the frequency measured when the resonance point is approached from the high frequency side will differ slightly from that indicated when tuning from the low frequency side, due to an oscillator "pulling" effect. The greatest accuracy and stability are obtained when the crystal resonant frequency is approached from a lower frequency.

Locating Parasitic Circuits in Transmitters

Circuits capable of supporting low frequency parasitic oscillations in R. F. circuitry may be located with the Checker. This method demands the removal of all voltages from the circuit being checked for reasons of safety.

Parasitic circuits are located with the Checker by exploring with the coupling loop in the vicinity of circuit components suspected of supporting oscillations at frequencies other than the operating frequency. Such circuits are most easily located if the frequency of the parasitic oscillation is identified beforehand. The Checker may then be tuned to this frequency and adjusted for the most sensitive absorption loading condition. An opening of the tuning eye when the loop is held near a circuit component indicates that component is part of the parasitic circuit. Most low frequency parasitic circuits are associated with the plate and grid R. F. chokes in amplifier stages.

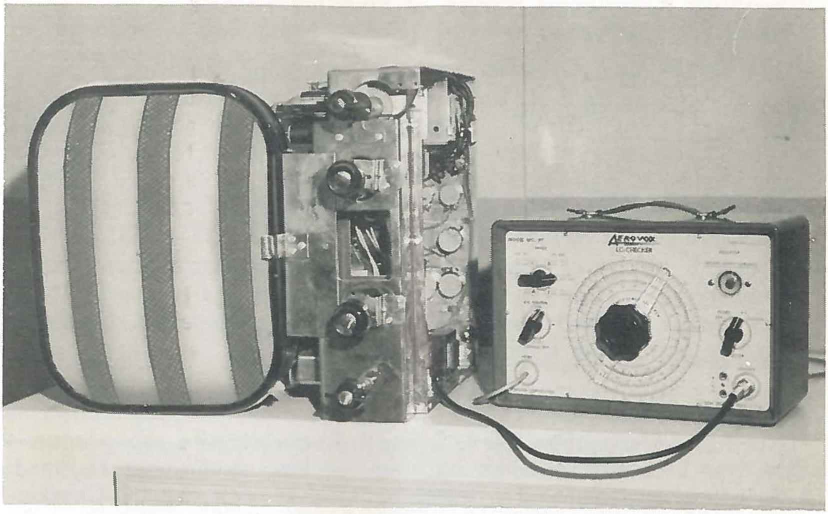
Using the Checker as a Signal Generator and for Signal Substitution

Since the LC-Checker constitutes a highly stable, accurately calibrated oscillator, it may be employed as a signal generator for use in determining the tuning range of receivers, providing marker signals for visual alignment of broadband I. F. circuits, and checking the coverage of other oscillators and signal generators. With the use of auxiliary quartz crystals, the Checker may be crystal controlled to provide standard frequencies of high accuracy for television I. F. sound and picture carrier markers, etc.

In using the Checker as a tunable signal generator, a warm-up period of about 5 minutes should be allowed to permit the oscillator to reach thermal equilibrium. This will insure maximum frequency stability. After this period, the Checker is ready for use.

To check the frequency range of a radio receiver, enough stray signal will usually reach the receiver to make any direct coupling unnecessary. A short length of wire may be necessary on the receiver antenna binding post however. The receiver is then tuned to one extremity of its range and the Checker, in an oscillating condition, is tuned through the appropriate ranges until a "plop" or other indication is heard in the receiver output. In some receivers having poor image rejection, two responses may be detected. These will be separated by an interval equal to twice the I. F. frequency and should differ considerably in strength. In accordance with the usual practice, the receiver local oscillator is placed higher in frequency than the received signal, so that the indication detected when the Checker is set at the lowest frequency is the correct one and should be stronger. The other extremity of the receiver tuning range is determined in the same manner.

One of the more common troubles encountered in T. V. receivers is a defective stage in either the video amplifier, video detector or video I. F. strip. This results in a blank raster (absence of all video information) on the cathode ray tube (C. R. T. or picture tube). In the case of intercarrier receivers this may also result in the loss of sound. The L. C. Checker is ideal for trouble shooting this type of defect and in a matter of minutes the defective stage can be isolated.



Typical Operating Procedure

1. Set "Selector Switch" to "R. F." position.
2. Connect the red alligator clip of the clip cord assembly through a 5 mmf capacitor to the grid of the video amplifier and the black alligator clip to the common negative of the receiver. Turn contrast control of the receiver to maximum. Set the LC Checker to a frequency that the video amplifier will accept and pass. Check the C.R.T. for the presence of a series of black bars. The presence of these black bars indicates that the video amplifier is operating satisfactorily. In this same manner work progressively toward the front end of the receiver (for example video detector stage next, 4th video I.F., 3rd video I.F. etc.) When injecting a signal into the I.F. strip, the LC Checker should be set to the video I.F. frequency of the receiver. Let's assume we have worked progressively toward the front end and we are now injecting a signal into the grid of the first video I.F. tube. We note that the raster remains blank with no evidence of the series of black bars. It can then be assumed that the trouble lies between this point and last point where we injected the signal and noted the black bars on the C.R.T. It is then a simple matter to locate the defective unit by voltage and resistance checks.

Generating Crystal Controlled Marker Signals

The LC-Checker may be used as a source of highly accurate crystal controlled signals for marking television I. F. sound and picture carriers and other standard frequencies if suitable piezoelectric crystals are available. In this application, the crystal is plugged into the socket marked "XTAL," and the "Selector" switch is turned to "R.F." The Checker is then tuned to the crystal frequency, care being taken to approach it from the low frequency side. When the eye remains open at the crystal frequency, the LC-oscillator is being stabilized by the crystal.

Checking Frequency Range of Oscillators and Signal Generators

In determining the tuning range of operating frequency of signal sources, such as an R. F. oscillator or signal generator, the Checker response is just opposite of that noted when a passive circuit is checked. As the LC-Checker is tuned through the frequency of the R. F. source being measured, a slight closing of the eye tube will be noted. Coupling may be accomplished either by means of the inductive loop or by coupling to the red alligator clip with "Selector" switch on "R. F."

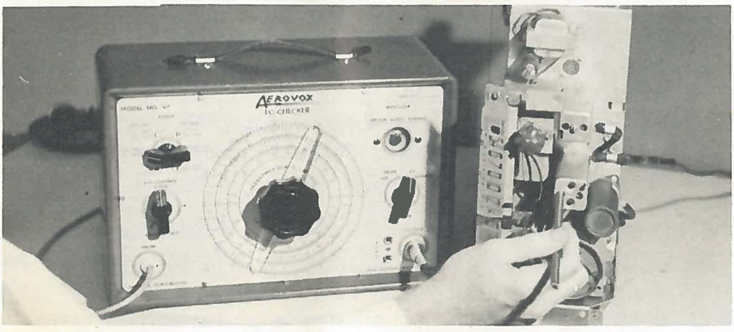
An R. F. voltage of about one volt will be required to give an indication on the 6E5. The eye control should be adjusted to the point at which the eye is slightly open. In this condition, an external signal will have the most visible effect.

Aligning Receiver Circuits

It is possible to align the R. F. and I. F. circuits of a super-heterodyne type broadcast or communication receiver, or the stagger-tuned I. F. stages and traps of a television receiver with the LC-Checker without the application of voltages to the circuits being tuned.

The first step in the "cold" alignment of a radio receiver is to determine the proper I. F. frequency. This may be accomplished by reference to the receiver instruction manual, from other published information, or by testing with the Checker. The latter is done by connecting the clip cord test leads of the Checker to several of the I. F. transformers in turn and locating their resonant frequencies. These will usually be found to group around one of the standard I. F. frequencies and can be assumed to have been originally at that frequency.

Each I. F. stage is then aligned to that frequency by connecting the clip cord leads in turn between grid-and-ground and plate-and-ground of each stage and tuning the corresponding transformer winding until the Checker eye opens. The Checker should remain set at the I. F. frequency determined as above. The red alligator clip of the clip cord should be connected to the "high" side of each transformer being aligned, with the black clip connected to ground.



Front-End Alignment

When the I. F.'s have been set, the front-end R. F. circuits may be aligned and tracked. To do this the Checker and receiver dials are adjusted to some frequency near one end of the receiver tuning range and each circuit in the receiver front-end, which operates at signal frequency, i. e. antenna tuner, R. F. stage and mixer, is capacity coupled to the Checker and tuned with its trimmer capacitors or inductive trimmers to give a response on the Checker. The same procedure is then performed near the low end of the receiver tuning range. For broadcast receivers covering 550-1600 KC, alignment frequencies of 600 and 1400 KC. are usually employed. If the receiver coils were originally designed properly, and the gang-tuning condenser has not been damaged, the circuits aligned at 1400 KC. should be found to check within a few percent at the low end.

Tracking the Oscillator

When the I. F. frequency has been determined and the tuning range of the receiver is known, the local oscillator tracking range is defined. In modern practice, the local oscillator is set above the frequency of the received signal by an amount equal to the I. F. frequency and must maintain this spacing over the entire tuning range.

Thus, if the receiver tuning range is 550-1600 KC. with a 456 KC. I. F., the oscillator must tune from 550 plus 456, or 1006 KC. to 1600 plus 456, or 2056 KC. In practice it is customary to check the oscillator tracking at 600, 1000, and 1400 KC.

The first step in this procedure is to set the receiver dial to 1400KC. and tune the oscillator shunt padder until the oscillator circuit is resonant at 1856 KC. (carrier plus I. F.) as indicated by the capacitively coupled LC-Checker. The receiver is then tuned to the 600KC. setting and the series oscillator padder is adjusted until the Checker, set at 1056 KC., indicates resonance. This procedure is repeated several times, adjusting first the oscillator shunt padder at the high end of the tuning range and the series padder at the low end, until accurate tracking is obtained at these two points. If the proper I. F. frequency has been chosen, the oscillator resonance should fall reasonably close to 1456 KC. when the receiver dial is tuned to 1000 KC.

When the receiver has been "cold" aligned in this manner, a final peaking of the I. F. and R. F. circuits, as well as oscillator tracking, should be performed. For this purpose the receiver should be turned on and the LC-Checker used as a very loosely coupled signal generator.

The I. F. stages are peaked first by setting the Checker to the I. F. frequency and coupling it to the mixer grid. Sufficient signal should reach the receiver if the test lead is connected to the grid and placed about one-half inch from the red clip of the Checker. An increase in the noise output of the receiver should then be noted in the receiver output when the Checker is tuned to the I. F. frequency with the receiver gain open. Each I. F. adjustment is then carefully trimmed for maximum noise output. Very little tuning should be required to "peak" each stage.

The receiver front end circuits may then be given a final adjustment in the same manner, using either a signal from the LC-Checker moved some distance from the receiver, or by using a signal from a broadcast station. In making such adjustments, the same sequence of operations as outlined above should be followed.

ALIGNMENT OF T.V. RECEIVER CIRCUITS
(Traps, Sound & Video I.F.'s)

The extreme versatility and adaptability of the LC-Checker lends itself to the alignment of both T.V. sound and video I.F. stages in addition to the proper adjustment of adjacent channel and sound traps with power removed. This type of alignment is especially effective when performed on receivers that incorporate a stagger-tuned I.F. system since it is not complicated by tuning interaction as found in a multiple tuned I.F. system.

In aligning sound I.F. stages the same procedure is employed as in the alignment of broadcast or communication receiver I.F.'s as outlined previously. Reference to the manufacturer's service manual should be made to determine the exact sound I.F. frequency of the receiver being aligned. If the receiver is of the modern intercarrier type using a 4.5 MC sound I.F., it is recommended that a 4.5 MC crystal be used with the LC-Checker (See Paragraph—"Generating Crystal Controlled Marker Signals") to insure an even more precise and accurate alignment.

For video I.F. alignment the trap circuits should be adjusted first. For traps that are coupled to I.F. coils (transformers) it will be necessary to short out the I.F. winding during adjustment of the trap to prevent tuning interaction.

Typical Alignment Procedure

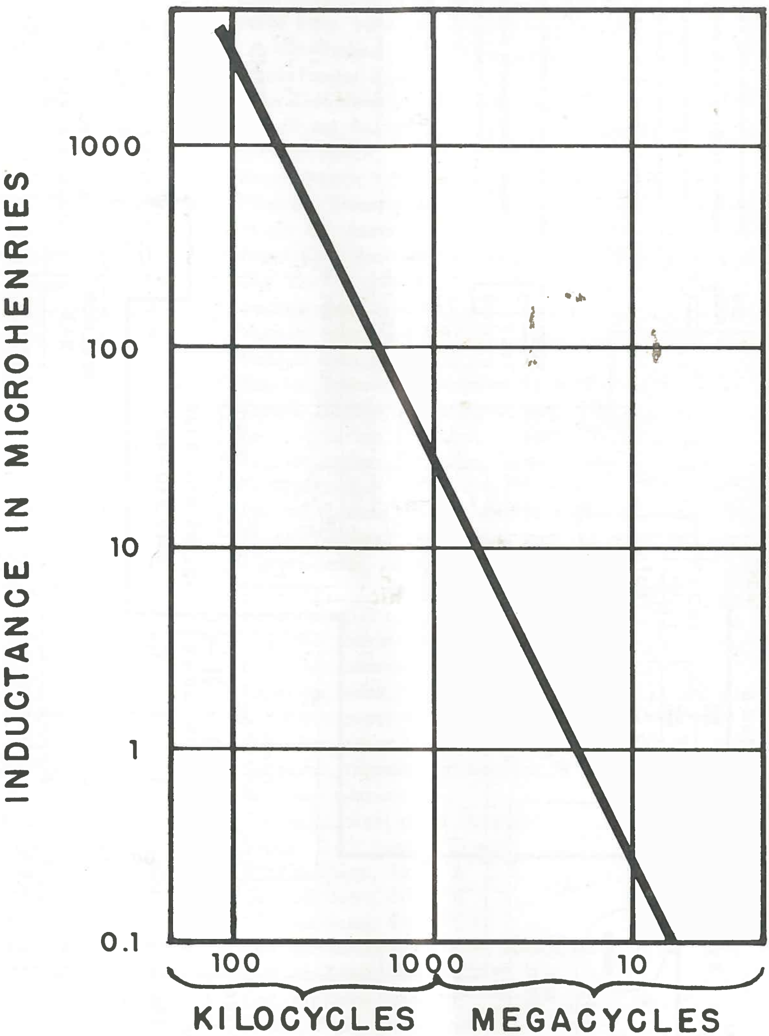
1. Allow LC-Checker to warm up for a period of not less than 5 minutes so that the oscillator will reach maximum stability.
2. Check manufacturer's service manual for exact frequency of trap to be aligned and set LC-Checker to this frequency.
3. Set Selector switch to R.F. position.
4. Connect the red alligator clip of the clip-cord assembly through a 5 mmf. capacitor to the high side of the trap and the black alligator clip to the low side.
5. Adjust the trap slowly until the opening of the tuning eye is at maximum. The trap is now resonant at the specified frequency.

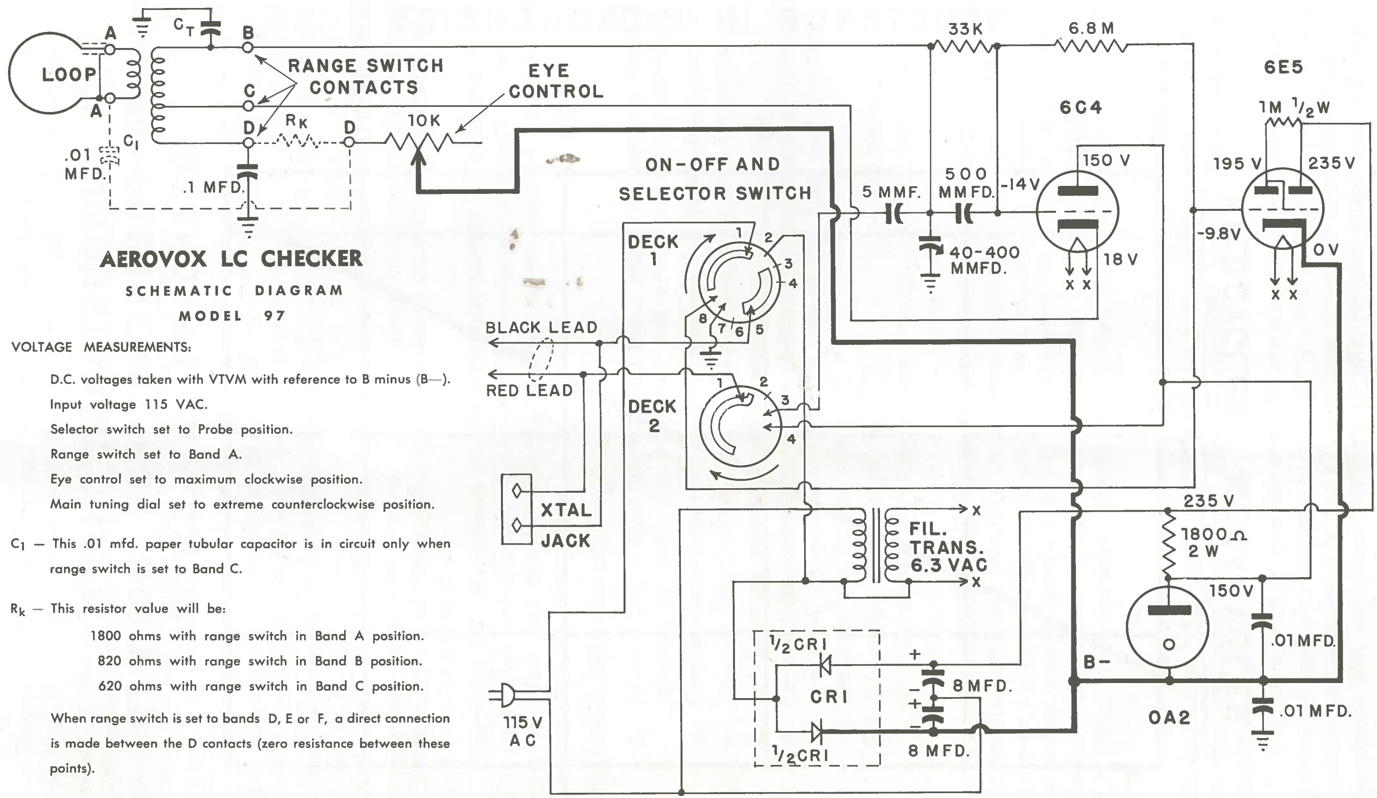
Upon completion of the trap adjustments, the video I.F. coils (transformers) are adjusted in the same manner. It is important that care be taken to align each stage to its assigned I.F. frequency otherwise the overall bandwidth will be incorrect, resulting in an unsatisfactory alignment. Trap circuits that are inductively coupled to the I.F. coils (transformers) should be shorted out during adjustment of the I.F.'s.

After having adjusted the trap and I.F. circuits, the receiver should be turned on. Connect an antenna and tune to an operating channel so that the video and sound can be checked by the "eye and ear" method.

The LC-Checker can be used in conjunction with a sweep-signal generator and oscilloscope to provide accurate "marker pips" on the oscilloscope waveform of the I.F. response curve. In this manner we can ascertain the individual settings of the various traps and I.F. coils (transformers) and their proper position on the overall I.F. response curve.

INDUCTANCE CHART
L VS FREQUENCY FOR .001 MFD. STANDARD CAPACITOR





AEROVOX LC CHECKER

SCHEMATIC DIAGRAM

MODEL 97

VOLTAGE MEASUREMENTS:

D.C. voltages taken with VTVM with reference to B minus (B—).

Input voltage 115 VAC.

Selector switch set to Probe position.

Range switch set to Band A.

Eye control set to maximum clockwise position.

Main tuning dial set to extreme counterclockwise position.

C_1 — This .01 mfd. paper tubular capacitor is in circuit only when range switch is set to Band C.

R_k — This resistor value will be:

1800 ohms with range switch in Band A position.

820 ohms with range switch in Band B position.

620 ohms with range switch in Band C position.

When range switch is set to bands D, E or F, a direct connection is made between the D contacts (zero resistance between these points).

C_t — Compensating trimmer capacitor, one per band (6 used).

AEROVOX
LC CHECKER
MODEL 97

PARTS LIST

Part No.	Quantity Per Unit	Description	List Price Each
2062-1	1	Cabinet	$6.70
2062-2	1	Cabinet Handle	.45
2062-3	2	Cabinet Handle Clamps	.20
2062-5	1	Main Assembly Panel	5.50
2062-6	1	Probe Form, bakelite	.80
2062-7	1	Clip-On Probe	.85
2062-8	3	Black Pointer Knobs	.20
2062-9	1	Main Dial Knob	.45
2062-10	1	Magnifying Pointer	1.10
2062-13	1	Selector Switch	1.50
2062-14	1	Range Switch	3.95
2062-17	1	Filament Transformer	2.30
2062-18	1	Magic Eye Assembly	1.00
2062-19	1	Probe Cord Assembly	5.95
2062-20	1	Clip Cord Assembly	4.95
*	1	Vacuum tube, type 6E5	
*	1	Vacuum tube, type OA2	
*	1	Vacuum tube, type 6C4	
*	1	Resistor, carbon, 1.0 megohm, ½ watt	
*	1	Resistor, carbon, 620 ohm, ½ watt, 5%.	
*	1	Resistor, carbon, 820 ohm, ½ watt, 5%.	
*	1	Resistor, carbon, 1800 ohm, ½ watt, 5%.	
*	1	Resistor, carbon, 33000 ohm, ½ watt	
*	1	Resistor, carbon, 6.8 megohm, ½ watt	
*	1	Resistor, carbon, 1800 ohm, 2 watt	
2062-27	1	Potentiometer, 10000 ohm, carbon	.70
2062-28	1	Capacitor, 40-450 mmfd. variable, air dielectric	5.50
*	2	Capacitor, electrolytic, PRS 150v — 8 mf.	
*	2	Capacitor, ceramic disc, D1-7 .01 mf. 600v	
*	1	Capacitor, ceramic disc, DI-1 5 mmf. 600v	
*	1	Capacitor, mica, 1468LS .0005 mf. 500v	
*	1	Capacitor, paper tubular, P84CM .1 mf 200v	
*	1	Capacitor, paper tubular, P84CM .01 mf 400v	
2062-34	6	Capacitor, trimmer, air dielectric, 4-40 mmfd.	.45
2062-35	1	Rectifier, selenium	1.60
2062-36	1	Connector, front panel "Leakage"	.70
2062-37	1	Socket, front panel, "Crystal"	.30
2062-24-1	1	Coil, oscillator, Band "A"	1.35
2062-24-2	1	Coil, oscillator, Band "B"	1.20
2062-24-3	1	Coil, oscillator, Band "C"	1.10
2062-24-4	1	Coil, oscillator, Band "D"	1.10
2062-24-5	1	Coil, oscillator, Band "E"	1.20
2062-24-6	1	Coil, oscillator, Band "F"	1.10
*	2	Socket, 7 pin, printed circuit	
2062-38	1	Cord, power, 6 foot, grey, parallel blade plug	.60
2062-39	1	Capacitor, mica, standard, .001 mfd., ±2%, with combination binding posts (auxiliary part)	1.85

* Available from your authorized Aerovox electronic parts distributor.

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