

The Alden-Somerbridge Set

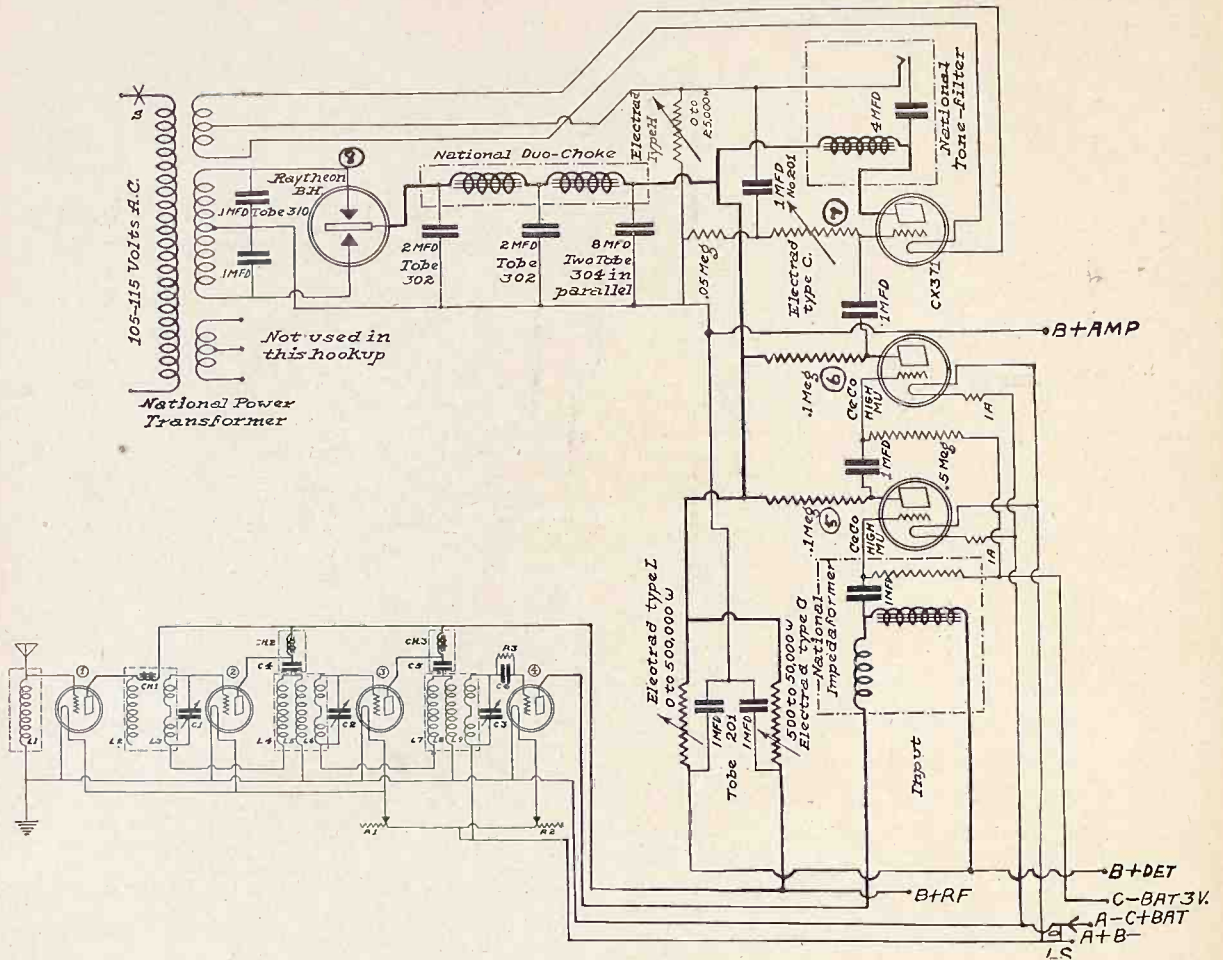


FIG. 4.

How to wire up an Alden-Somerbridge Circuit (lower left) to work in conjunction with the Lynch Lamp Socket Amplifier. Eight tubes are required, including the Raytheon type BH (upper left). The Alden-Somerbridge Circuit is a balanced radio receiver, without audio. The Lynch Lamp Socket Amplifier consists of an eliminator of all B batteries, and A eliminator and C eliminator for the final audio tube, and a splendid tone quality 3-stage audio amplifier.

[The theory of the Alden-Somerbridge Receiver was discussed in the October 30 issue, wherein also were published a top view of the set with two transformer audio stages, and the schematic diagram of that hookup. This week's illustration shows the circuit in conjunction with the Lynch lamp socket amplifier. This makes a 7-tube set, with the eighth tube a Raytheon type BH. The audio channel consists of one impedance stage and two resistance stages. A B battery eliminator is used. The final audio tube is heated from AC and gets its grid bias from the eliminator. The logical way to build the 6-tube set is on a 7x22 or 7 x 24" panel, with the two audio transformers in the set. Blueprints are available for the 6-tube receiver. The 7-tube model preferably should be built with audio omitted, say on a 7x18" panel, for console installation, the audio and eliminator being placed in the lower part of the console.]

By Wendell Buck

LAST week's article on the Alden-Somerbridge Receiver discussed the underlying theory of the new and original radio frequency amplifying system and stabilization method used in the set. "Theory," says the average experimenter after reading a technical article, "is all very well, but the important thing is: how well does it work out in actual

practice?" Circuits and circuit theories come and go. Some are very impressive on paper, but not so impressive when worked out in their final form in the completed receiving set. In the last analysis ten minutes' actual operation of the set is worth more than ten hours of

theorizing about its inherent advantages.

Before starting the description of the construction of the Alden-Somerbridge Receiver it will be well to review the actual advantages of the set as they will work out in the operation of the receiver in your living room. Bearing these points in mind, the operator will be able to get the utmost out of the set without experimenting for himself to find out what's what.

LIST OF PARTS

for RF Side of Set

- One Alden-Somerbridge RF Transformer, Type No. 1.
- One Alden-Somerbridge RF Transformer, Type No. 2.
- One Alden-Somerbridge RF Transformer, Type No. 3.
- One Alden-Somerbridge Balancer, Type 1A.
- One Alden-Somerbridge Balancer, Type 2A.
- One Alden-Somerbridge Balancer, Type 3A.
- One two-section variable condenser, .00035 mfd. for each section.
- One single condenser, .00025 mfd.
- Two National Velvet Vernier Type C illuminated dials.
- One Lynch grid leak, 2 meg.
- One Fixed Condenser, .00025 mfd.
- One Fixed Condenser, .002 mfd.
- Front panel, subpanel, brackets, binding posts.

1. Constant tone quality, unaffected by bringing the receiver to the resonance point, that is, its point of maximum efficiency. Due to the exact and perfect stabilization of the radio frequency circuits, pure, undistorted tone quality is maintained even when the greatest energy is put into the audio amplifier. In a word, volume varies as you wish it; tone quality remains pure regardless of whether you have a whisper or maximum volume coming from the speaker.
2. The circuit can be brought into full resonance without worry of oscillation or "spilling over" of the tubes.
3. The unique balancing method used in The Alden-Somerbridge Receiver allows great sensitivity without the set being critical or difficult to handle or tune.

It Works On Any Aerial

4. Due to the high efficiency and tremendous amplification on the radio frequency side, distant stations are received with extraordinary volume. During experimental tests with the set, DX station up to 1,000 miles away came in with volume practically equivalent to local reception.
5. The set works with almost equal efficiency on long and short serials. In tests using antennas varying from twenty feet vertical to 200 feet horizontal only a slight difference in sensitivity was noticed. The antenna circuit in the receiver is in no way affected by the length of aerial.

Building the Receiver

Referring now to the radio side of the schematic diagram, Fig. 4, you will notice that the first RF stage is untuned, capacity coupling, rather than straight transformer coupling. This feature in the circuit gives a very high degree of selectivity. The second and third RF stages, also using the Alden-Somerbridge system, are tuned with .00035 mfd. condensers.

Complete stabilization in the radio frequency amplifier is achieved through the special Alden-Somerbridge RF Transformers and Alden-Somerbridge Balancers. These parts are really the heart of the entire circuit. The set cannot be built right without them. Any other equipment in the list may be changed for other apparatus of equivalent and identical characteristics.

The circuit has been so well and thoroughly worked out that no adjustments are necessary. The Balancers are fixed, and when once the builder has incorporated them in the set, he can rest assured that his receiver will perform at maximum efficiency without touching or tinkering with the Balancers.

The detector circuit is non-regenerative. There is no reason at all for use of regeneration in circuit, and the non-regenerative feature gives every assurance that the detector will pass on to the audio amplifier the undistorted signal received from the RF side of the set.

Most of the apparatus is mounted on the baseboard, and nicely spaced for short, neat wiring. There is plenty of room to work in. No attempt should be made to crowd the apparatus on an undersized panel and baseboard, with the result that the builder must resort to clever methods to solder certain connections.

Easy to Identify

The Alden-Somerbridge RF Transformers and Balancers are equipped with convenient soldering tabs, making for easy connections.

It may be necessary to use a little spaghetti, but not very much, in the close wiring down near the binding post strip on the rear of the baseboard. (Fig. 1 in October 30 issue.)

The illuminated type dial enhances the appearance of the completed receiver immensely.

In the matter of selecting the audio channel, use good judgment. If you select transformer coupling you can't expect any receiver to give wonderful quality of tone if it has cheap or poorly designed transformers.

Operating the Set

The most satisfactory tube combination you will find for use in the Alden-Somerbridge Set is the following.

Detector socket 200A.

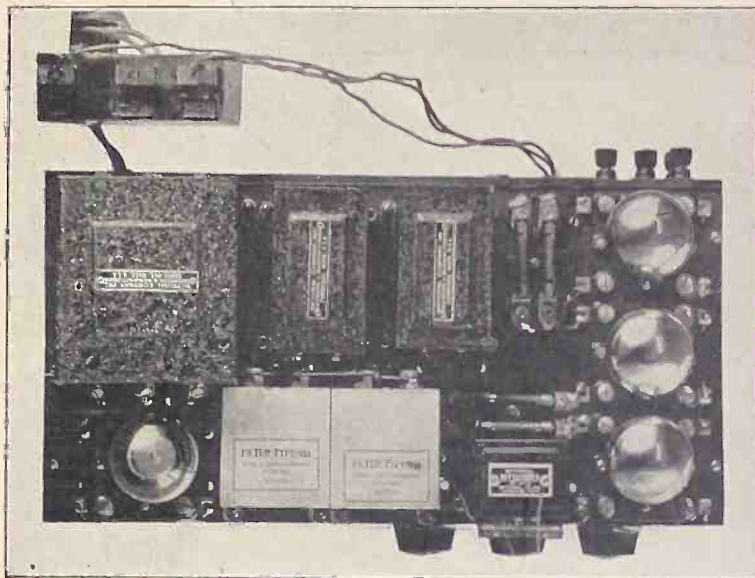


FIG. 5

Top view of the Lynch Lamp Socket Amplifier, which may be used in connection with any receiver. It consists of a B eliminator and a 3-stage audio amplifier, with A eliminator and C eliminator for last audio tube only.

Three RF stages and first AF 201As or CeCo type A.

Second audio stage 112 or CeCo type F.

Use 45 volts B voltage on the detector tube; 90 to 135 volts B on the B plus amplifier post; 7½ volts C bias will be right for the 112 type power tube.

Looking directly at the front panel, the two dials, of course, control the variable

condensers tuning the radio frequency stages. The dials operate at the same settings: that is, a station will come in best at 70 and 70 on the dials, or at 55 and 55, not at 60 on one and 45 on the other. Tuning any receiver to the best advantage is largely a matter of getting the knack of it. Rotate the two dials together, slowly, keeping the numbers approximately the same. When a station comes in, adjust the left-hand dial to secure the best volume, then similarly, the right one.

There are two rheostat knobs on the front panel. The left-hand one controls the radio frequency tubes; the right-hand one controls the detector and audio frequency tubes in the 6-tube model, and the detector alone in the 7-tube set.

When you first hook up the set and connect the batteries, turn both rheostats well up and tune in a strong signal from a station nearby. Adjust the condensers to get maximum volume, then slowly turn down the rheostats until there is a real loss in signal strength when you back them off more. The point just before you start to lose volume will be a good permanent setting for the rheostat.

Antenna Lengths

Control the volume of the set with the RF rheostat (left-hand one) and leave the other rheostat alone. The theory of this is that a weak impulse (such as in the RF side) is much easier to control than a strong one, such as in the audio stages.

As mentioned previously, with The Alden-Somerbridge Circuit, antenna length is not of such vital importance. Experiments show that the set has practically the same degree of sensitivity and selectivity on a twenty-foot aerial as on one 200 feet long. You will get very good results from a short indoor aerial strung around the room.

If you are free and clear, out of town, and away from such disturbances as car lines, power houses, and other forms of local interference, there is a slight advantage in using plenty of aerial.

LIST OF PARTS

For Lynch Socket Amplifier

- Two Bakelite panels 2x14x3/16".
- One Bakelite subpanel, 7x14x3/16".
- Two hard rubber Garfield brackets.
- Four Eby push type sockets.
- Four Eby binding posts, B-, B+, B+RF, B+Amp.
- One National Universal Power Transformer.
- One National first stage Impedaformer, Type B.
- One National Duo-Choke.
- One National Tone Filter.
- Two Tobe 4.0 mfd. condensers (304).
- Two Tobe 2.0 mfd. condensers (302).
- Five Tobe 1.0 mfd. condensers (201).
- Two Tobe 0.1 mfd. condensers (310).
- Two Lynch double resistor mounts.
- One Lynch single resistor mount.
- One 0.5 meg. Lynch metallized resistor.
- One .05 meg. Lynch metallized resistor.
- Two 0.1 meg. Lynch metallized resistors.
- Six lengths flexible Acme Celatsite.
- Two Electrad Royalty Variable Resistances, Type C, 500-50,000 ohms.
- One Electrad Royalty Variable Resistance, Type H, 0-25,000 ohms.
- One Electrad Royalty Variable Resistance, Type L, 0-500,000 ohms.
- One Electrad single circuit open jack.
- One Raytheon BH tube.
- One Cunningham CX371 tube.
- Two CeCo high mu tubes (type G.)
- Two 1-A Amperites.
- One Cutler-Hammer toggle switch (S at cross in Fig. 7).
- One Eveready 4½-volt C battery.
- One jack plug for speaker.