Converting Conventional Lorenz Two Tuber

Conversion is quite simple. Drill 3/32" hole and insert eyelet in hole c. Remove .005 which runs from eyelet a to the grid of second stage. Discard. From eyelet A run the .02 disc capacitor to eyelet c. From eyelet c run one CK705 to the grid of second stage. Run second CK705 from this same eyelet c to eyelet b, which is ground. Solder the .01 from the grid flea clip of second stage to the ground flea clip. Use spaghetti on all bare component leads. NOTE--carefully observe the polarity of the diodes: this is extremely important. The cathode ends of the diode are marked with a narrow strip as well as the letter K.

Converting PC Lorenz Two Tuber

Remove the .005 grid coupling condenser from eyelets 1 and 2. With a sharp model knife, such as exacto, remove the shaded portion of the copper strip between positions 2 and 4 on the base. Drill a 1/16 diameter hole at 4. Care must be used to avoid tearing the copper strip. Insert .02 in eyelets 1 and 2. Solder 1. Insert diodes in 2, carefully observing the required polarity. Solder 2. Insert the other end of first diode in eyelet 3. The unanchored end of the second diode goes into the hole 4. Place the .02 disc in eyelet 3 and hole 4 and solder both. Snip off the excess. All components are placed on the underside of the PC base--the side shown, and laid flat against the base. Observe carefully the polarity on the diodes. See foregoing paragraph.

General Hints for Operating the Two Tube Duo Diode

Tuning the TT receiver is much the same as the older circuit, except that a much lower idle is used on the first stage. In spite of the lower idling the second stage will hold itself cut off to 0. This allows a greater economy of battery operation and considerably extends tube life.

Hookup just as you did the earlier version, making sure pot is set at maximum resistance. With meter in MJ 1, you should have an idling current of about .1 ma. If lower than this advance pot until you obtain the required reading.

Key transmitter to tune receiver for greatest drop. The first stage MUST super-regenerate to operate. This can be determined by a headset, listening for the audio hiss. Adjust antenna coil for the loudest hiss possible--this is most sensitive spot.

Insert another meter if possible in MJ2. This should hold to 0, if first stage is supering at .1. Decrease pot in first stage, and observe both meters. As first stage is decreased, second stage will have an occasional tendency to jump up a slight bit. Advance pot, until there is no tendency of meter in second stage to jump at all. Now advance pot just a bit higher, so that lowering battery voltages will not accidentally trip second stage. This is the operating point for the tube in the first stage.

It may be necessary with some of the new RK61's to run the first stage idle up at .2 ma for the first 4 to 5 hours of operation. As the tube ages, the idle can be decreased somewhat. Happy landings!

Ace Radio Control
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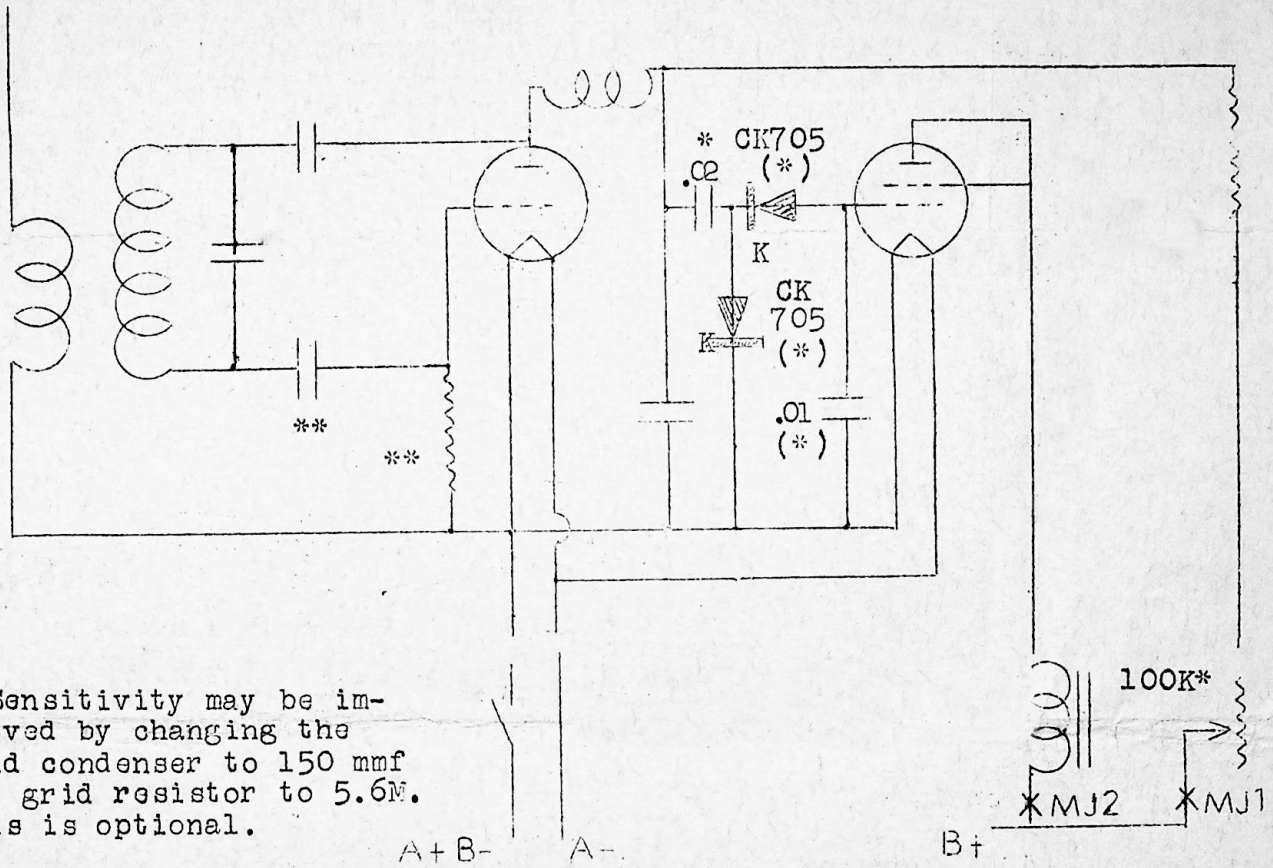
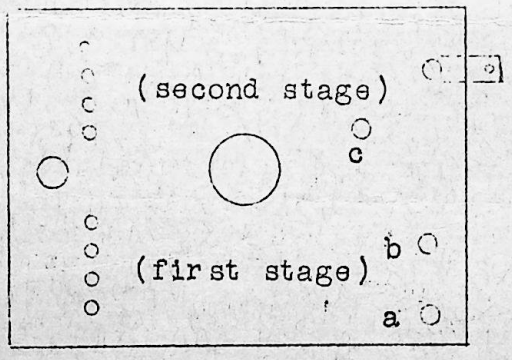
LORENZ TWO TUBE

DUO DIODE CONVERSION

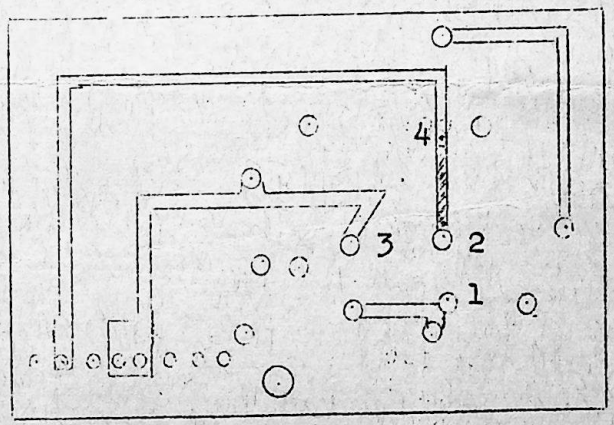


**Sensitivity may be improved by changing the grid condenser to 150 mmf and grid resistor to 5.6M. This is optional.

Conversion Kit includes:
2 CK705 Diodes 1 100K pot
1 .02 disc ceramic
1 .01 disc ceramic



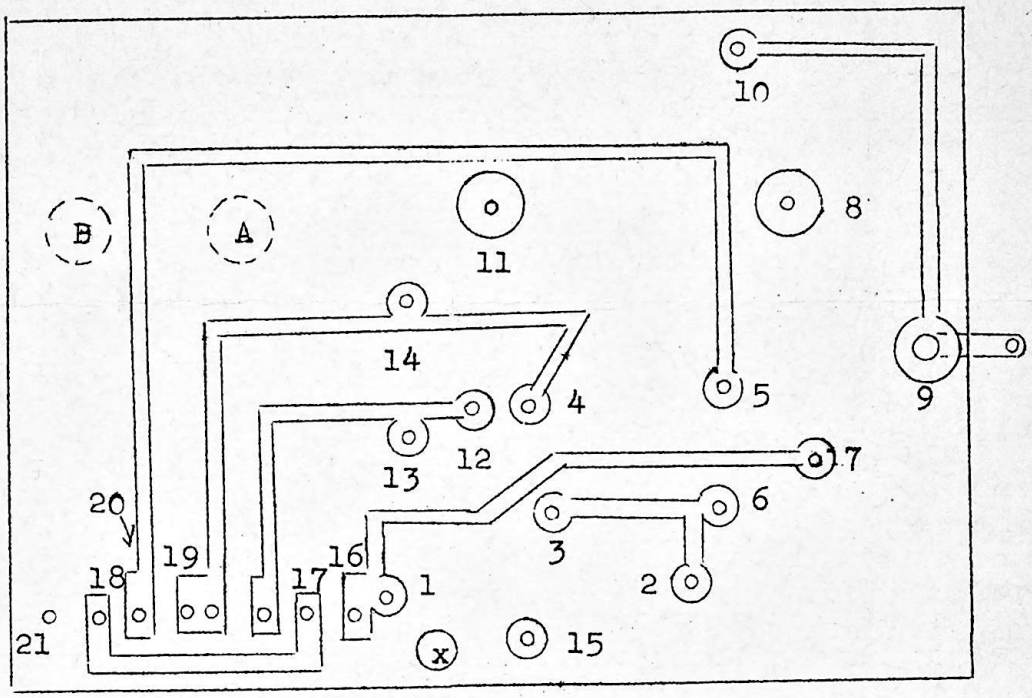
Conventional Lorenz base as it appears from underside. Eyelet c is new and must be added to present base.



ACE PC base viewed from underside. Only the portions of the copper you will need to use is shown. Wiring in the additions are done on this side

In the schematic above--
unmarked components have same values as in original circuit
* represent components whose values are changed in new conversion
** represent optional component value changes
(*) represent components not used on the original

Ace PC 2--Lorenz Two Tube Printed Circuit Receiver



Your Ace PC2 will be easy to hook up if a few simple proceedures are followed. All you'll need in the way of tools are a small soldering iron such as Ungar 25 or 37½ watt, and a wire cutters. We strongly recommend the use of Ersin solder, which is furnished.

As you receive the kit, all components are mounted by their own leads in the exact location they are to go. All you need do to wire, is to turn receiver with printed side up and make all solder connections. To make sure you do not miss any, a numerical guide is provided above. While it is not absolutely essential that guide be followed to the number, it is provided as a check to make sure no connections are missed. In practice, solder the component lead to the eyelet, and run a small amount of solder from the eyelet to the copper "wire". Care must be used to avoid connecting strips of copper which are close together. Make sure you have a SOLDER joint and not a high resistance "rosin" joint, which will cause malfunction.

Component wires are bent in order to hold them in place. Before solder connection is made, wire should be straightened and soldered and then cut off close. Straighten only one wire at a time, so that components remain in place until soldered.

Care should be used when soldering flea clips to copper to keep solder from flowing into the head of the clip. Receiver may be propped up vertically when making these connections to avoid this possibility. Solder can be removed from the flea clip head, but this is a tedious proposition.

When connections 8 and 11 are made on base, turn receiver over, and solder the tank coil to the leads of the wires you just completed in the base. Receiver will function erratically if these solder connections on coil are not made.

Four wire cable connections are made as follows: Bring red wire up through h hole marked X and place into eyelet 15. Now solder. Bring white hookup thru hole and put into flea clip 17. Solder. Bring black hookup thru hole and solder into flea clipl9. Bring yellow wire thru x and solder to flea clip 21.

The four leads may be cut evenly and soldered into the four pin plug if that type of installation is to be used. See the next page for suggestion on pin placement. This completes the wiring.

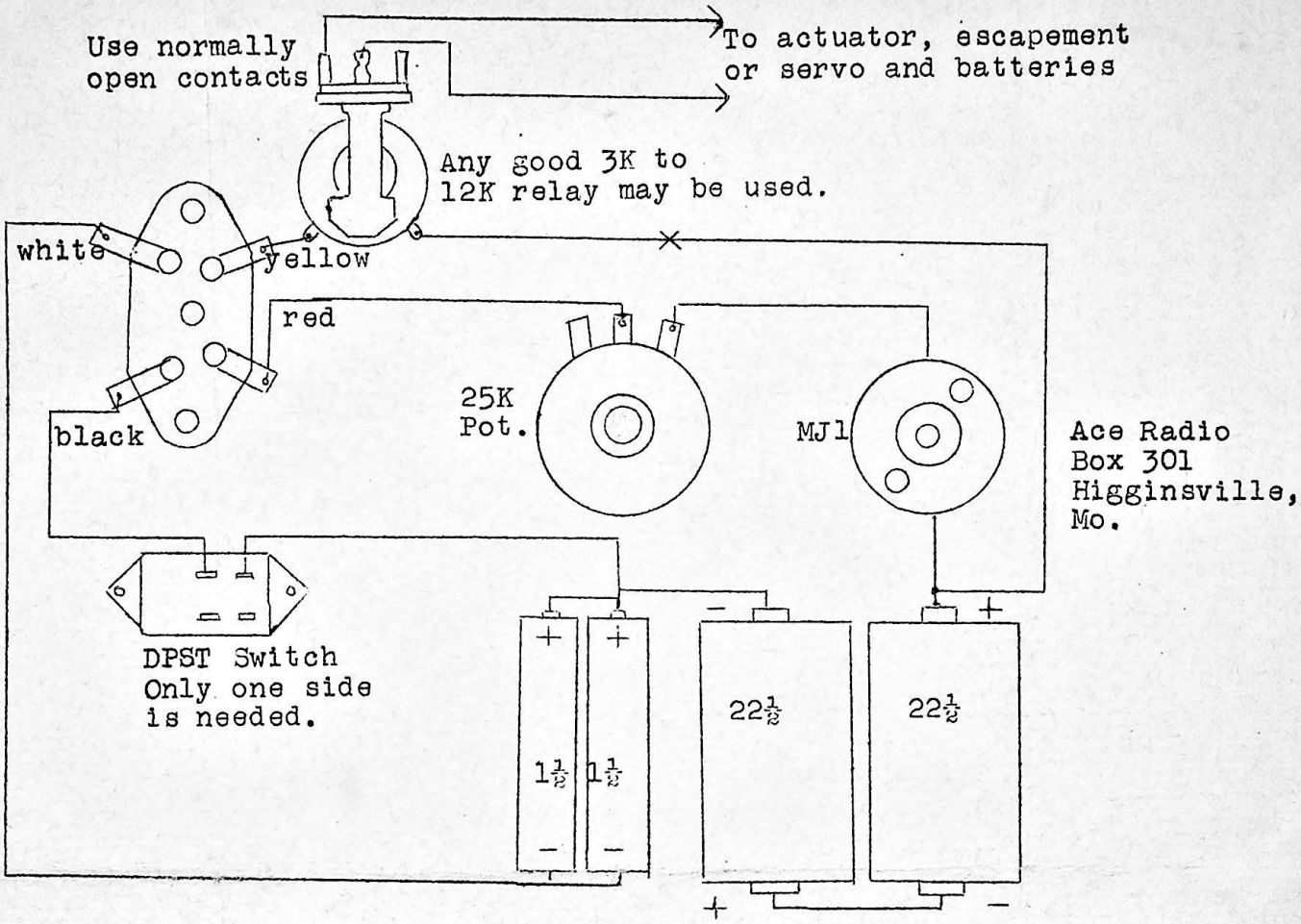
On the base drawing, you will note two dotted circles marked A and B. This denotes tube position. A indicates the first stage, in which an RK61 should be used. B denotes second stage and an RK61, XFG1, 1AG4 (MPC1) or 1V5 may be used. The flea clips have been marked with red dots to denote plate connections and this is where the red dot on the tubes are to go. In using a 1AG4, the screen grid and plate leads are twisted together and slid into one flea clip. Use some of the #20 plastic covered wire for tube hold downs in the small holes drilled in base. Wire receiver up as per pictorial diagram on the next page.

Antenna coupling coil is movable to find the most sensitive spot. This is generally about midpoint on the tank coil. Coil may be cemented with a dab of fingernail polish if desired, although this will not be absolutely necessary. Antenna may be anywhere from 20 to 28 inches. The Lorenz circuit is not critical in this respect.

To test, make sure 25K pot is turned to maximum resistance. Insert o-3- or O-5 MA meter in meter jack, using one of the plugs provided for meter leads. The other plug is shorted out for use under flight conditions when meter is taken out of circuit. Turn on filament switch. Meter should read about .5 ma and the needle should fluctuate a slight bit, generally less than .2 ma. This indicates set is super-regenerating and is ready to be tuned. Tune slug in coil with an insulated screwdriver, while keying transmitter. At one point the meter will drop to .1 or less, which triggers second stage from 0 to 2.5 or 3 ma depending on type tube and relay resistance.

In the event meter reads higher, set is not superring, or the potentiometer is not at meximum. Check potentiometer setting. If meter still reads high, check your connections to make sure you haven't accidentally connected two copper lines together. Headset may be inserted in series with meter, which will give quite a loud raucous hiss when set is operating correctly. Also shifting the antenna coil in either direction may help get the set operating. If all the foregoing do not help, check your solder joints. One of the tank circuit leads is probably a high resistance joint. Of the hundreds sold to date, three have been returned and were all three found to be a hr joint.

Operation of second stage may be checked when first stage is operating correctly. Meter may be inserted in series with relay. It should idle at 0 or slightly higher, depending on tube used in second stage. With a 1AG4, it may be found necessary to increase 1st stageidle to .7 or .8 to get 1AG4 to idle at 0. It may also be found necessary to slightly lengthen the antenna. With an RK61 in second stage, idle may be held down on first stage to .4 or even .3 ma without triggering, and set will prove just as sensitive as at higher idle. With the longer lived RK61's, we recommend their use in both stages. Even an "old" RK61--one that will no longer operate in the first stage, may be used in the second with many hundreds of hoursof satisfactory service.



When you have familiarized yourself with the operation of your receiver, you are ready to install in the plane. Receiver may be mounted by cementing to foam rubber at least 3/8 to 1/2" thick. Channels may also be constructed to allow receiver to slip into plane. Hole may also be drilled through an unused portion of the base and receiver may be bolted to a Lord Shock mount.

Relay is mounted separately. With the positive action of the relay which is had with the Lorenz circuit, many relays may be mounted solidly without any danger of vibration. If you are troubled with vibration, a Lord Shock mount will cure your trouble.

Your PC2 will give you many hours of trouble free operation. Before flying with it the first time, be sure to tune it on a distance check. Close to the transmitter, anything goes, but the farther you get away the finer the tuning must be. This is not difficult to do. Simply have a friend key your transmitter, while you take a walk with the meter in place. Tune periodically to make sure you are "on the nose." If check has been made at a distance of 400 to 500 yards, you're safe. Your plane will be under control as far as you can see it.

You will find it unnecessary to do a lot of tuning, as time goes by. It will not be necessary to do a distance check every session, unless receiver has been moved in hard landing. Checks should be made, however, before each session to make sure 1st stage is idling at .5 MA or more and for current drop near transmitter. Always check battery voltages, too, before each session UNDER LOAD. Receiver operation will become erratic when B voltage goes below 40, and A voltage below 1.2.