

# Putting The ARC5 On Two-Meter SB

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Under the auspices of the Central Technical Net of Air Force Mars whose NCS is AF5LHX the author worked out a conversion of the T23 ARC-5 for two-meter sideband.

The two 1625's are replaced with two RK34's to gain an extra stage and to reduce the current drawn from the power supply.

One half of the first RK34 (see fig. 1) is a 32.5 mc xtal controlled oscillator. This tube is installed in the original oscillator socket. The tuned circuit for this oscillator is mounted just in front of the oscillator socket. The 25 mmf APC capacitor is fastened to the side of the chassis. The coil is suspended between the stator of this capacitor and a tie point.

The second half of this tube is a doubler to 65 mc. The channel D oscillator coil is re-wound to resonate at 65 mc with the output capacity of the tube.

The second RK34 is installed in the original 1625 multiplier socket. Only one half of this tube is used. It functions as a doubler to 130 mc. The channel D plate coil is rewound to resonate at 130 mc with the output capacity of the tube.

The 832A that was used as a multiplier is now used as a mixer. The channel D grid coil which is on the same form as the second RK34 plate coil is rewound to resonate at 130 mc with the input capacity of the mixer. The screen of the mixer has no dc voltage applied to it. A 14 mc tuned circuit is connected between the screen and the chassis. The coil form

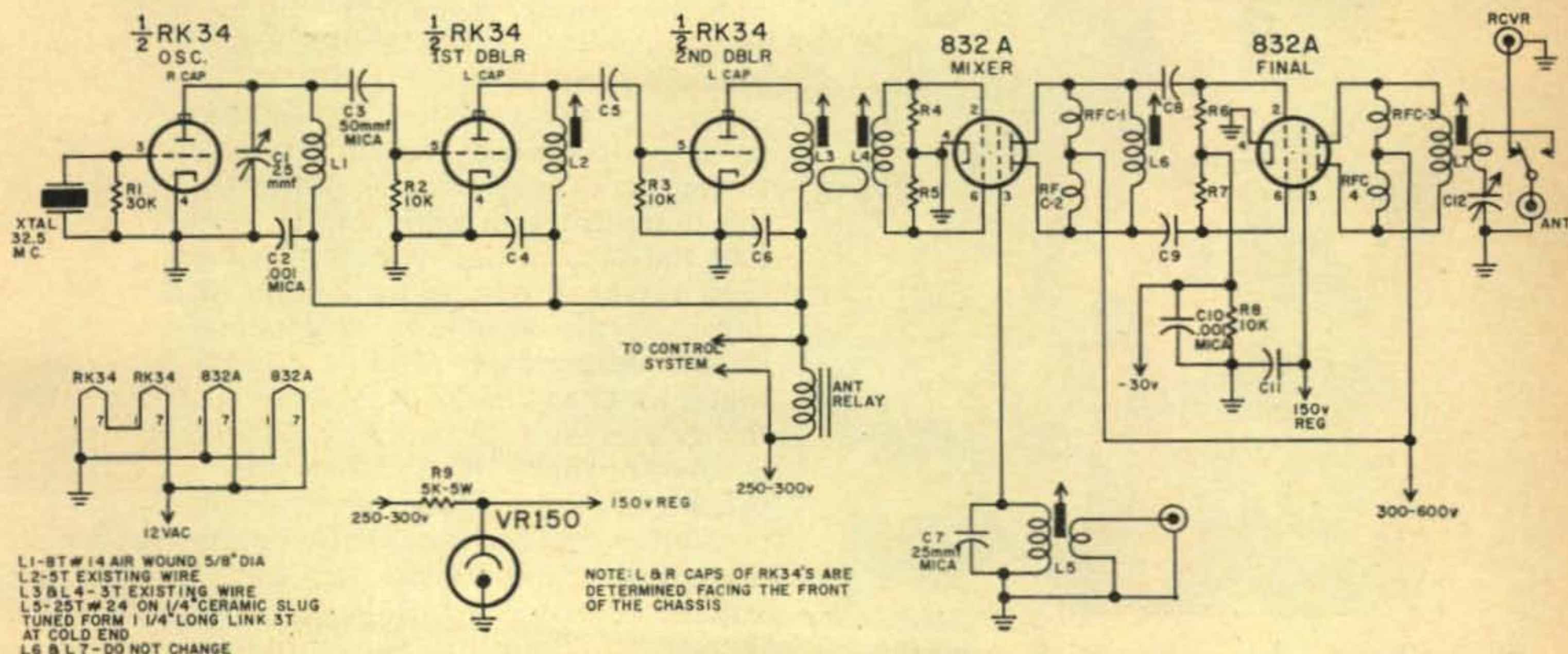
for this tuned circuit is mounted inside of the box that holds the 832A tube socket. It is mounted horizontally below the tube. The screen bypass must be removed from the socket. The lead from the cathode to the plug in the bottom of the box is removed and the cathode is grounded to the box with the shortest possible lead. The pin thus released is used to bring the inner conductor of a piece of coax to the link on the screen tank. The other end of this coax goes to a chassis fitting mounted on the side of the chassis. The plate circuit of the mixer is left intact as it is in the original unit.

The channel D coils for the mixer plate, the final grid, and the final plate are used without any modification.

A few changes must be made to convert the 832A final from class C to linear operation. These consist of changing the grid resistor to 10K, applying -30 volts of bias, and operating the screen at 150 volts regulated. The VR150 that regulates the final screen voltage is mounted in front of the oscillator socket. Some ARC5's already have a hole here with a plug in it. The dropping resistor for the VR is mounted under the chassis.

The antenna relay is retained and is operated by putting it in series with the B plus feeding the RK34's. To allow this relay to be de-energized while receiving its coil is shunted by the control system.

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The control system can take on many forms. Perhaps the simplest is a TPDT switch which operates the antenna relay, silences the receiver, and turns on the SB exciter. If the SB exciter has a VOX relay with enough spare contacts the antenna relay and the receiver can be controlled that way. Also an extra relay controlled by the VOX may be used.

The RK34's should be operated at 250 to 300 volts. The 832A's may be operated at plate voltages ranging from 300 to 600.

### Tune Up

To make the initial tune-up remove the ground end of the grid resistor of the first RK34 doubler and insert a milliammeter with a range of about 10 *ma*. Apply plate voltage to the RK34's and adjust the oscillator tuning capacitor for a maximum reading on the meter. Disconnect the plate voltage, the meter, and reconnect the resistor. Always be sure to kill the plate voltage after each adjustment.

Put the meter in series with the ground end of the second RK34 doubler grid resistor and adjust the plate coil slug of the first doubler for a maximum reading.

Move the meter to the ground end of the 832A mixer grid resistor and adjust the plate coil slug of the second doubler and the grid coil slug of the mixer for a maximum reading. Repeat all of these adjustments with the meter still in the mixer grid circuit.

Move the meter to the ground end of the final grid resistor. With no bias, screen, or plate voltage applied to the final, feed a 14 *mc* carrier from the SB exciter to the screen of the mixer and adjust the mixer plate coil slug for a maximum reading. Removing the 14 *mc* carrier should make the meter read zero. If it does not, the mixer plate is tuned to 130 *mc*. If this is the case re-insert the 14 *mc* carrier and tune the mixer plate higher to the next maximum. Now tune the final grid coil slug for a maximum reading.

Connect two # 47 dial bulbs across the antenna fitting and apply all voltages. Tune the final plate coil slug and adjust the loading capacitor alternately for the highest brilliancy of the bulbs. Reduce the carrier from the SB exciter to the minimum and talk into the mike. The bulbs should flash with modulation.

The filaments of the RK34's are hooked in series while the filaments of the 832A's are hooked in parallel. This is required because the RK34's are six volt tubes and the sockets of the 832A's do not have a connection for the filament center-tap.

Although the output of this transmitter is comparatively low, 10 to 15 watts, it will do a fine job of getting out if coupled to a reasonably efficient antenna. For those who want more power output this unit makes a good exciter for a high powered linear final. ■

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