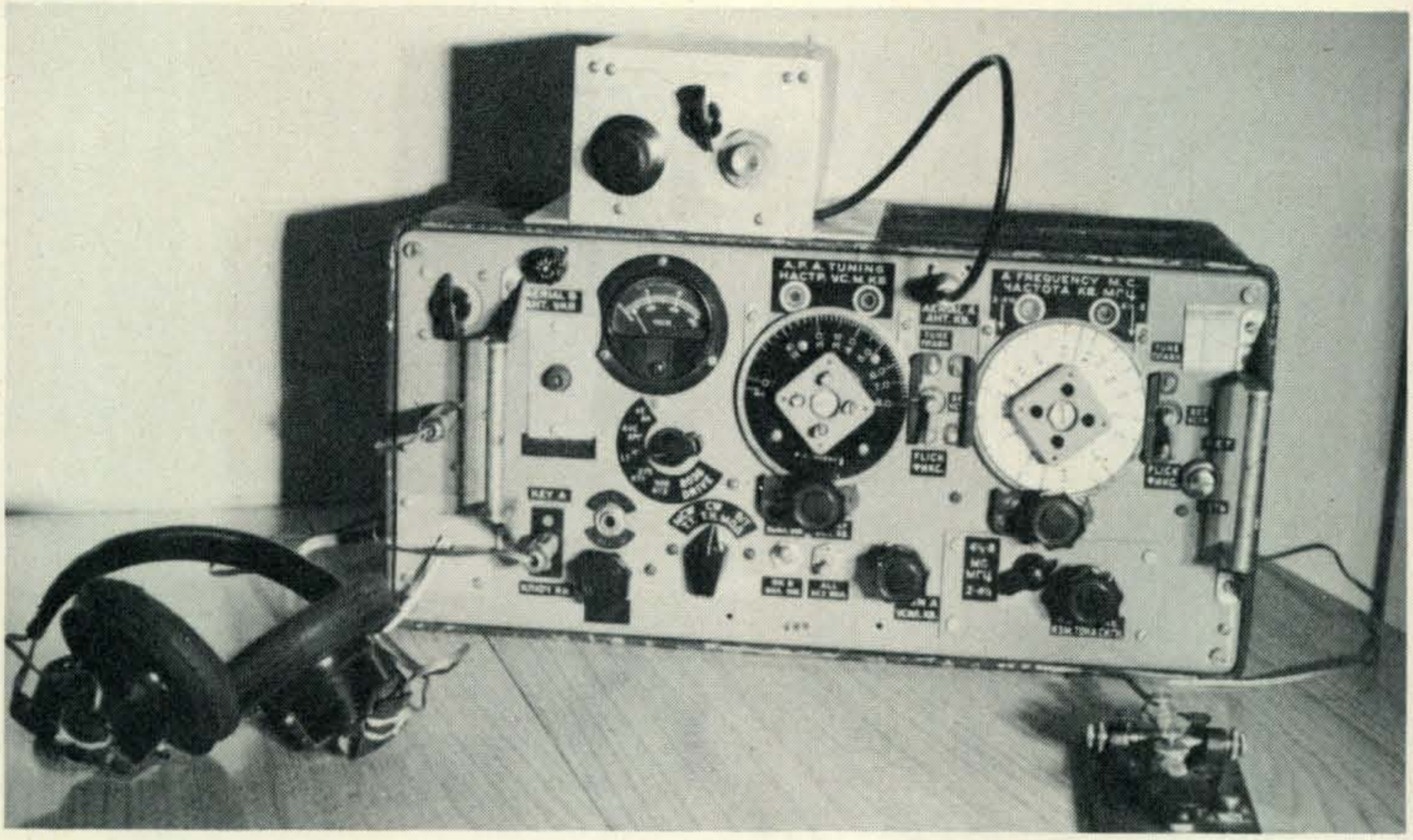

Front view of the converted No. 19 Mark II set with a wide range antenna coupler.

IMPROVED PERFORMANCE FROM THE NO. 19 SET

BY SAM KELLY,* W6JTT

AFTER using my converted No. 19 set on a few portable operations, it was obvious that several changes could be made to greatly improve the performance and convenience of operation. The original antenna coupling circuit was designed strictly for coupling to a 12 foot whip, while I usually wound up trying to load in to a random length of wire. Bandpass was poor, especially on 40 meters. The set tended to chirp under certain loading conditions, and the a.m. feature was useless.

On the asset side, the set was cheap, rugged, and compact enough for truly portable operation. The following modifications can be made in a few hours and will result in greatly improved performance.

Keying and Bias

A complex bias control system was originally required to get adequate performance with control grid modulation. Since the a.m. feature was worthless, the bias system was no longer needed. C.w., performance can be improved by removing the components associated with the 6H6 bias regulator and rewiring the final amplifier bias circuit as shown in fig. 1. Using a keying relay eliminated the +275 volts on the key and also cured a peculiar problem caused by the final amplifier oscillating when receiving high level signals.

Tuning Range and Bandspread

The set can be modified for optimum operation on either 80 and 40 meters, or on 160 and 80. Either modification is simple, but the easiest one for beginners is the 80/160 meter modification. This is because it is possible to wind up transmitting 900 kc away from the desired frequency at 7 kc unless you have checked the buffer tuning with a grid dip oscillator or wavemeter.

*12811 Owen Street, Garden Grove, California 92641.

[1]Kelly, S., "Converting the No. 19 Set, "*CQ*, May 1969, p. 25.

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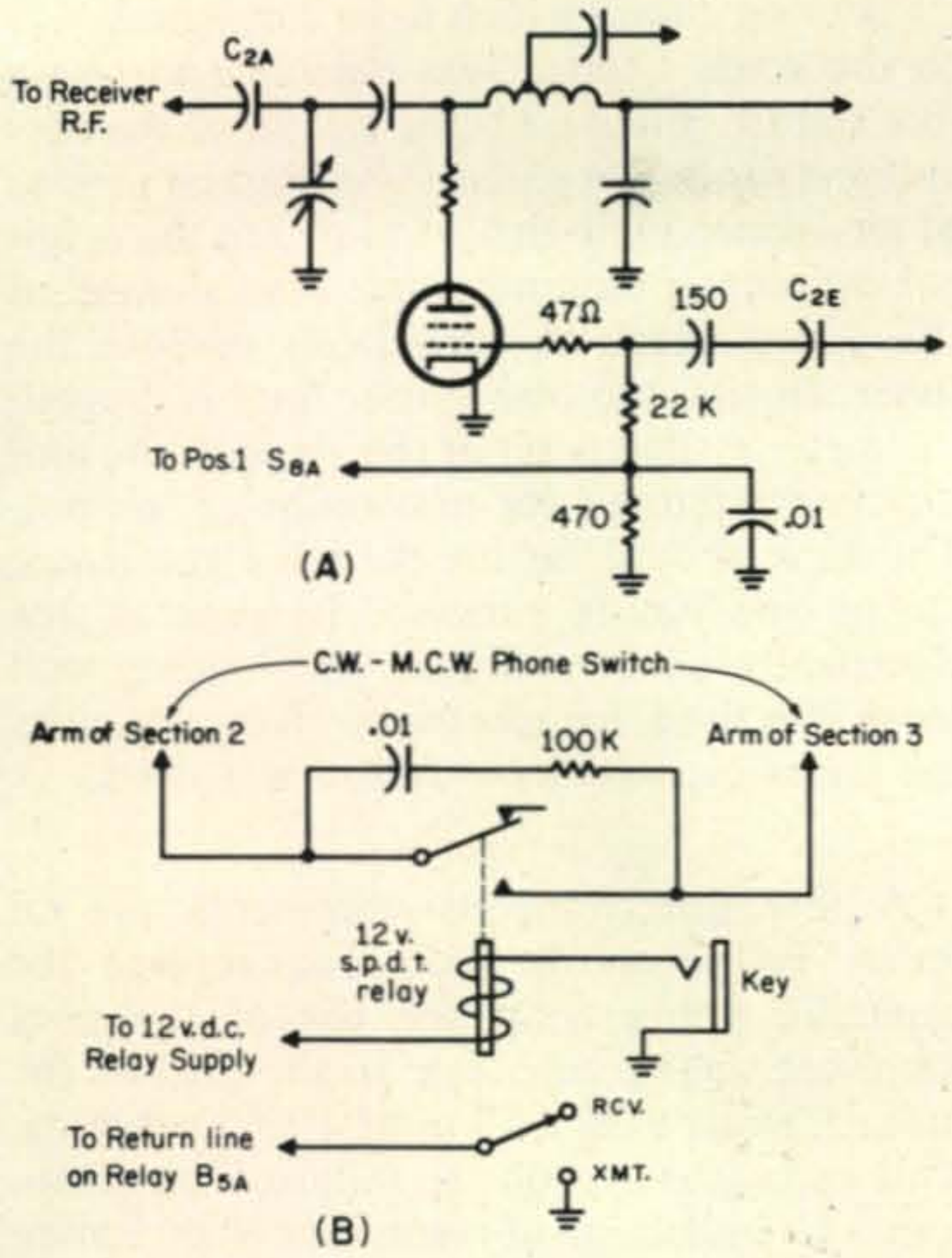

Fig. 1(A)—Modified bias circuit for the No. 19 Set. The following components have been removed: R_{1C}, R_{1D}, R_{43A}, R_{7G}, R_{7D}, R_{15A}, R_{15B}, R_{42B}, C_{15M}, R_{19A}, C_{15C}, C_{34A}, C_{2D}, R_{1E} and C_{15D} and replaced with the above circuit. Capacitor C_{2A} must be replaced with a 50 mmf, 1000 volt mica. (B) Modifications to the keying circuit include the addition of a 12 v.d.c. relay as shown above.

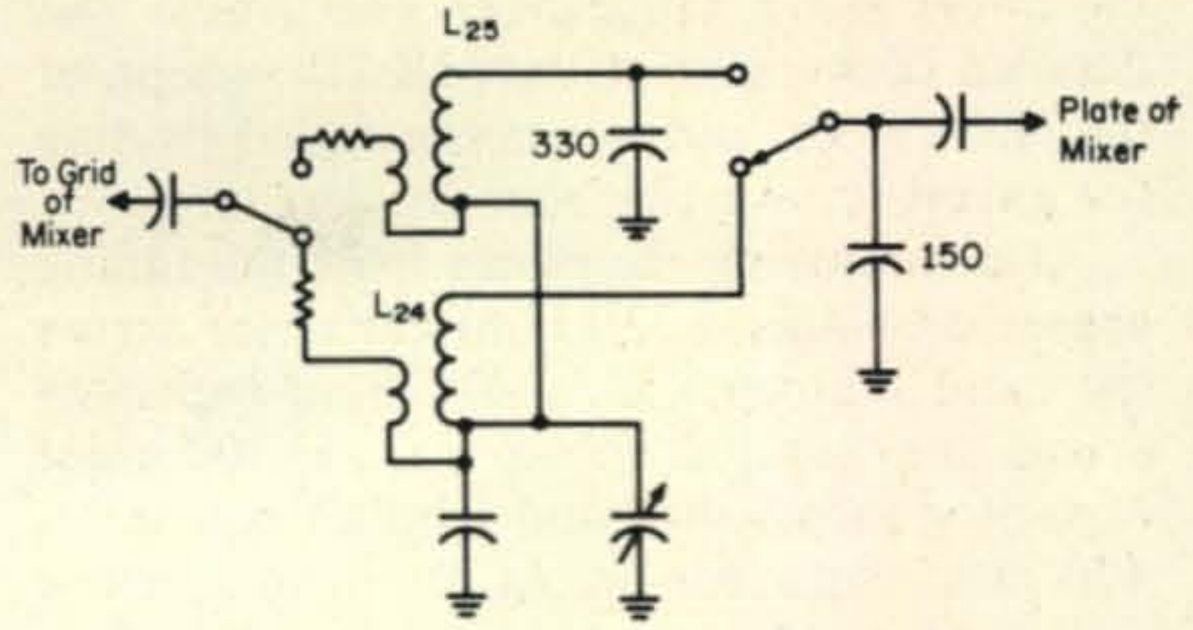

Fig. 2 — Receiver oscillator modifications for operating the No. 19 set on 80 and 160 meters.

The first step is the same for either modification. This is increasing the bandspread by removing plates from the main tuning capacitor (4 sections). Remove the set from the case and remove the three tubes next to the tuning capacitor. Cut through the web that holds the plates together three plates back from the front panel in each of the four sections. Peel the web from the remaining plates using your diagonal cutters. Remove all but the three plates in each section. This requires a bit of skill. I found it easiest to wiggle each plate back and forth with a soldering aid until it was loose then removing it by pulling it straight out with a strong pair of pliers. After removing the plates, trim the spacing bar to remove rough edges.

Modification for 40 and 80 Meters

Switch to band 2 (4.5-8 mc). Solder a 22 mmf capacitor across the 4.5-8 mc oscillator trimming capacitor. Set the main tuning capacitor 3/4 open (about 7.0 mc on the dial) and couple in a 7.15 mc signal. Adjust the receiver oscillator trimmer (band 2) until the signal is received. Switch the meter switch to DRIVE. Key the transmitter and adjust the RF DRIVE and BUFFER TUNE capacitors for maximum drive. Use a Wavemeter or Grid Dip Oscillator to be sure the transmitter is tuned up on 7.15 mc. Open the key and peak the receiver signal using the 4.5-8 mc receiver r.f. trimmer.

Now switch to band 1. Set the tuning dial to 2.0 mc. Solder a 130 mmf capacitor across the 2-4.5 mc oscillator trimmer. Couple in a 3.5 mc signal and adjust the trimmer until it is received. Peak using the 2-4.5 mc receiver r.f. trimmer. Peak the mixer and buffer capacitors (C_{10} E & F), located below the chassis, for maximum r.f. drive.

Modification for 80 and 160 Meters

This conversion was inspired by Jake, WB-2PAP, who sent me an article by G3TKR in

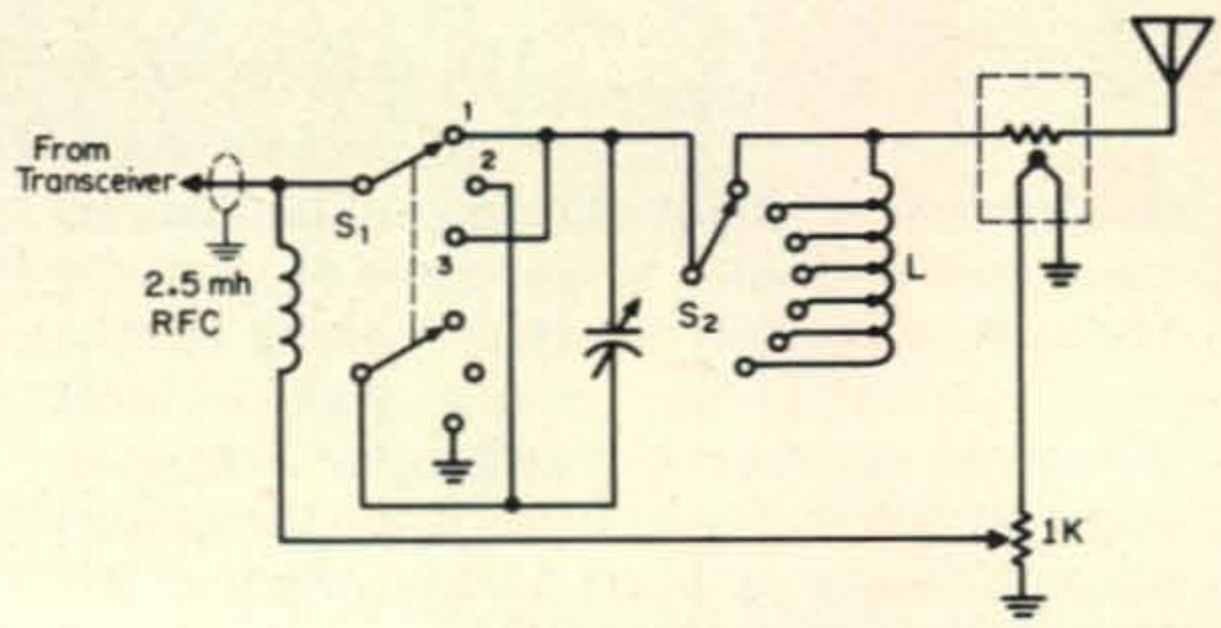

Fig. 3—Circuit of an antenna tuner designed for use with the No. 19 set. The switch positions for S_1 are 1 — Loading Coil Only; 2 — Series Capacitance; 3—Parallel Capacitance. Switch S_2 is a tap switch from a BC-375E tuning unit. The thermocouple, *Tc*, can be obtained from the antenna r.f. ammeter of an ARC-5. Inductor *L* is made up of 15 turns of Air Dux 2006T and tapped every other turn.

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the *Short Wave Magazine*.[2] The article was detailed conversion of the MK III version of the No. 19 Set, and is recommended reading for anyone converting that version.

After removing the plates from the tuning capacitor, solder a 330 mmf capacitor across the band 1 mixer coil, a 470 mmf capacitor across the band 2 mixer coil, a 300 mmf capacitor across the band 1 buffer coil and a 470 mmf capacitor across the band 2 buffer coil. Add the capacitors as shown in fig. 2 to the receiver oscillator coil. With this modification band 1 coverage will be approximately 1.8 to 2 mc and band 2 will cover 3.5 to 3.9 mc. Connect an additional 100 mmf transmitting grade capacitor in parallel with the plate tuning capacitor. Repeat the alignment procedure outlined in the 80/40 conversion, only this time peak the drive and receiver r.f. capacitors at 1.9 and 3.7 mc.

After completion of the conversion, make a new dial from a piece of art board or manila folder and calibrate it using an LM or 221 frequency meter.

Antenna Tuner

The original variometer incorporated an r.f. sensing circuit which fed a d.c. signal back on the coax. I felt it was desirable to retain this feature. Figure 3 is the circuit of the new antenna tuner. The circuit was built on a piece of aluminum plate drilled to match the original variometer mounting holes. An aluminum shield was made to completely enclose the tuner. In use, the transmitter final is dipped, the meter switch is set at the AE position, and the tuner adjusted for maximum r.f. output. The tank should be checked for resonance during the tuning process. In general, for electrically short antennas the loading coil alone was used, for electrically long antennas the series capacitance position was used.

General

A few miscellaneous comments are in order. To be on the safe side, replace the capacitor going from the top of the final amplifier tuning capacitor to the grid of the first r.f. stage with a 50 mmf 1000 volt mica. This capacitor is prone to failure. The symptom is no indication of resonance when tuning up on 40 meters.

Before replacing any glass tubes with their metal equivalents check the shield pin (pin 1). In most cases this pin has been used as a tie point for the +275 volt line. You can get quite a thrill by simply plugging in a metal tube. ■

[2]Raven, D.J., "More About the 19 Set," *Short Wave Magazine*, March 1969. 55 Victoria Street, London, S.W. 1, England.

WELCOME COMMITTEE FORMED FOR FOREIGN AMATEURS VISITING NEW YORK

BY GEORGE PATAKI,* ex-YO2BO

EVERY year, many foreign radio amateurs come to the United States, some of them for business, others for study or visiting friends and relatives. These amateurs want to meet American amateurs as much as the American hams try to meet local hams when they travel abroad. Many of these DXers know a few W and Ks, having had QSOs with them, but there is a real need for a center where every visiting foreign amateur can make some useful contacts.

I am myself a foreigner; I know how much I wished to meet American amateurs and how happy I was when I was invited by some of them to see their shack or to visit their radio clubs.

I would like to ask for volunteers for our program in the New York City area. Anybody who thinks they will enjoy welcoming foreign amateurs should drop me a letter, giving his address, phone number, profession, hobbies, time of availability and any information which may be helpful in organizing this program.

At the same time, foreign amateurs intending to visit New York City are invited to conact our welcoming group by writing me in advance and phoning me as soon as they get to New York City. ■

*34-24 76th St., Jackson Heights, N.Y. 11372. Telephone: 212-639-3195.

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