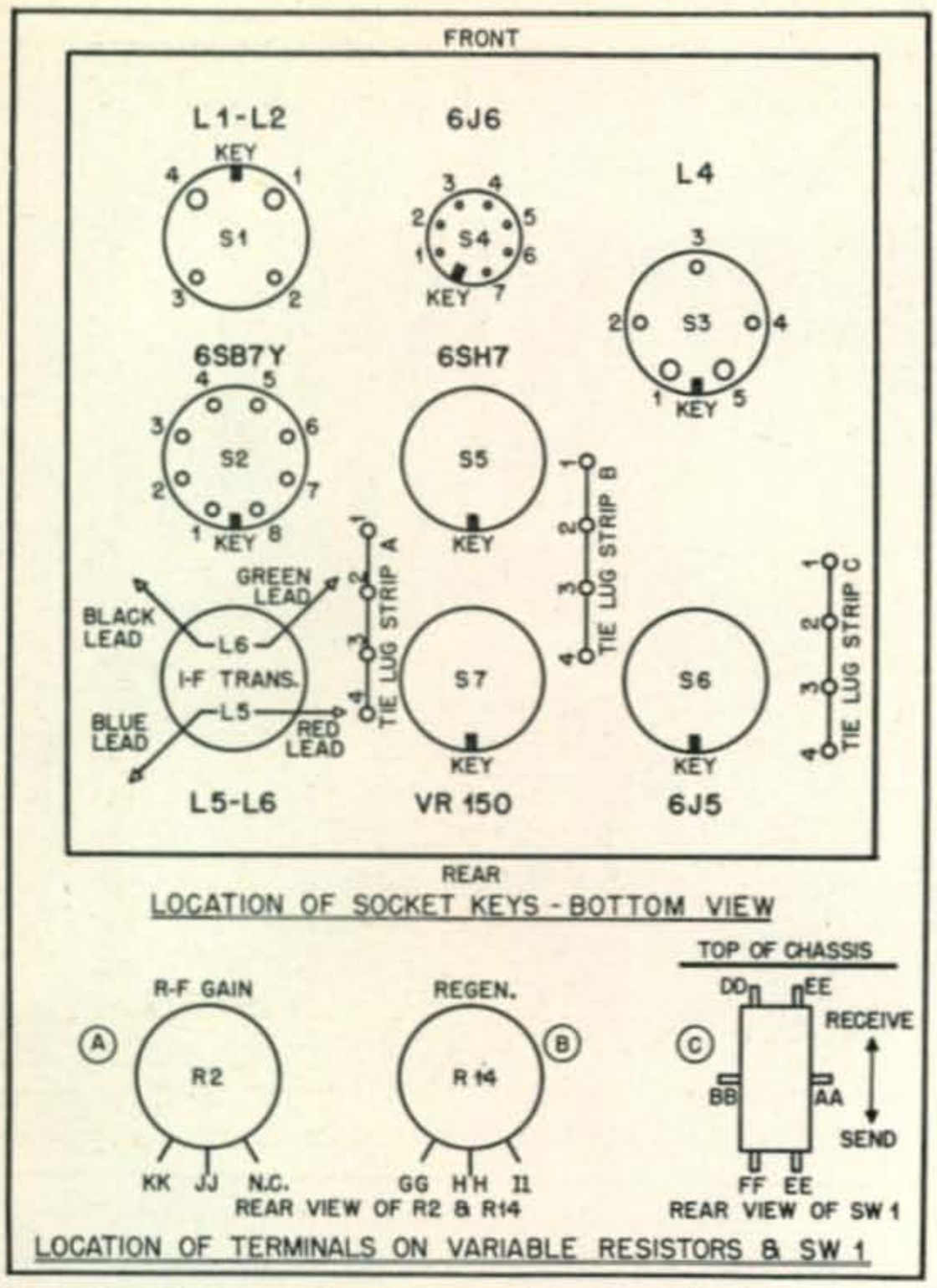


Fig. 4. Bottom view layout showing the location of socket "keys" and the placement of the tie-lug strips. Fig. 4a. Rear view of R2 indicating the terminals by letter, to correspond with connections in Fig. 1. Fig. 4b. Terminals on R14. Fig. 4c. Terminals SW1.

plus 7300 or 9000 kc (signal frequency *plus* the intermediate frequency). However, the band can usually be found by careful adjustment of *C12*. Once located, the band can be spread across the dial by adjusting the tap on *L4*.

C-w signals will be heard *only* when the regeneration control, *R14*, is adjusted to produce oscillation of the 6SH7. Radio phone signals will be heard without oscillation but maximum signal strengths will be obtained just below the point of oscillation.

Setting of Bandset Condenser

With the coils wound as shown in preceding paragraphs and with an intermediate frequency of approximately 1780 kc the bandset condenser (*C13*) was adjusted as follows:

3500–4000 kc band	60°
7000–7300 kc band	26°
14,000–14,400 kc band	55°

Zero degrees on *C13* indicates full capacity and 100 degrees indicates minimum capacity.

The mixer tuning and gain controls, *C1* and *R2*, are not critical but should be properly adjusted to obtain maximum results. *C1* will help to eliminate unwanted signals as it tunes the mixer to the frequency of the desired incoming signal. The mixer gain control can be adjusted to give the desired signal level in the headphones.

After obtaining satisfactory performance on the 7-mc band, repeat with the 3.5 or 14-mc coils, and locate these bands. Keep in mind that in isolated locations the 3.5-mc band will usually produce signals during the dark hours of the day and 14 during the daytime hours.

(*Continued on page 77*)

The Drooping Ground-Plane Antenna

B. A. ONTIVEROS, W6FFF*

The sketch shows a useful modification of the ground plane antenna that is easy to build, not too conspicuous and one that has excellent electrical characteristics.

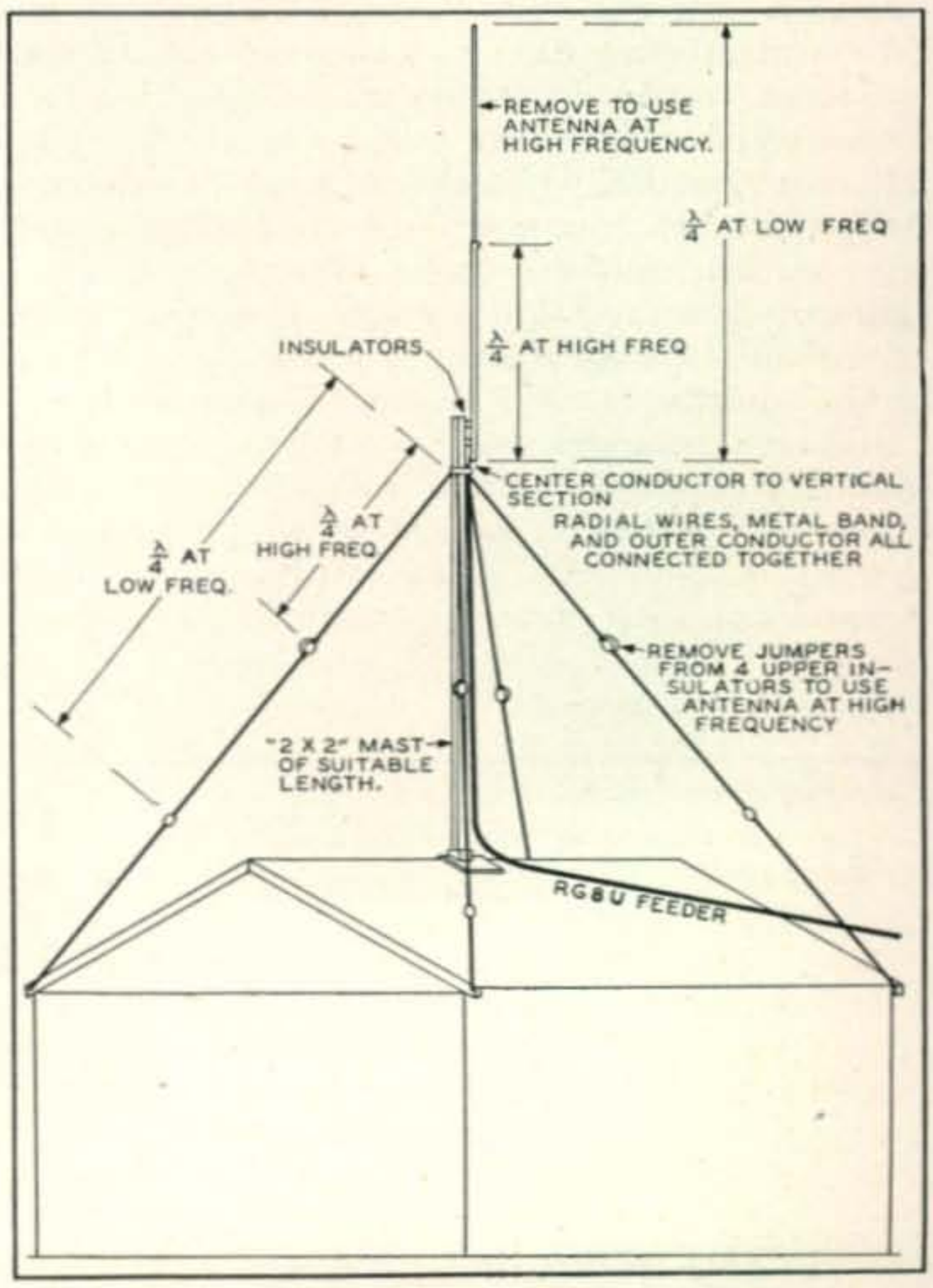
There are a lot of us who like to work 10 and 20 meters but are restricted as to antenna space. Many amateurs are further restricted by a landlord or neighbors who are quick to yelp about anything as complex as a tower and rotary beam, not to mention a couple of stacked rotaries!

The drawing shows a method of using the drooping ground plane on two bands without too much work to make the change from one band to the other. It is an easy one-man job to loosen one guy wire, lay the pole down, make the changes and push the pole up again. A single band 10-meter version can use an automobile whip for the vertical part and a slimmer pole for support. This then looks a great deal like a simple bc whip antenna—a natural where ham radio isn't welcome.

Half-inch aluminum electrician's conduit was tried on the lower part of the vertical, but proved to

(*Continued on page 70*)

**118 S. Alisos St., Santa Barbara, Calif.*



For sensitive neighbors, try this ground plane.

mouth Radio Club. As a member of the FMRC she operates on 10, 20, 40 and 80 meters, phone or c.w., at the club station, W2OEC. Jo tells us her first experience with phone was on MCARA's last Field Day where she operated for some 15 hours, and adds: "I enjoy phone immensely and plan to be on 10 or 75 soon."

However, hamming is strictly a hobby with Jo, and is only one of her interests. Her other hobbies are designing and sewing her own clothes, and dancing a good rhumba or Lindy hop.

Since July, 1942, Jo has been working at Coles Signal Laboratory as a radio engineer. "My assignment is in the d-f antenna section," she explains, "and the work deals mostly with the design and measurement of antennas and antenna systems in the low-frequency spectrum. As all antenna installations and field strength measurements are made in the field, a great deal of the work is out of doors, which I enjoy immensely. I should, by virtue of my job, exhibit a super-duper deluxe ham antenna array, but space and structure limitations in the housing project where I live prevent me from so doing—so I have to fall back upon the old faithful Hertz." [How about a balloon-supported antenna, Jo?—hi!]

Jo concludes: "The highlight of my career was in August, 1946, when General Ingles presented me with the Meritorious Civilian Award for outstanding work—an occasion which I shall always remember." To the best of our knowledge, Jo was the only YL in the agency to be so honored, and probably one of the few in the country—indeed a tribute.

OTHER FELLOW'S STATION

(*from page 34*)

junior operator, she received notice the government was issuing 6BOY for her home station. Sure enough—it *was* a boy. The boy is W6VDR, Lewis (LU) Kirk, very active in the Mission Trail Net.

Moving to Reno, Nevada, Jim Kirk built the first broadcasting station in that state, KFFR. Then back to California again and W6DEG, a call he has now held about 20 years. A few months ago W6VDR named his son James, and both Daddy and Grandfather are already planning on another op in the family. W6DEG's interests in ham radio are chiefly building, experimenting and "chewing the rag."

GROUND PLANE ANTENNA

(*from page 30*)

be too soft to stand up to the spring winds. But it is satisfactory for the vertical part on 10 meters alone. The same size tubing made of the stiffer alloys of aluminum is fine for the main part of the vertical section on both frequencies.

The main requirement of the insulators at the top of the pole is strength as they are subject to leverage from the tubing they support when there is a stiff wind blowing, as well as the strain put upon them when raising the pole. One type of insulator found satisfactory is that of porcelain furnished with a prewar type of house-mounted whip antenna made by Philco. No doubt several other types of insulators may be found that are as good or better.

(*QSY to page 70*)

Variations on the antenna mounting sketched can easily be devised to fit different situations as, for instance, the case where it is desired to mount the supporting pole directly on the ground. This can be done without any particular trouble because the angle of the guy-wire radials is not at all critical.

Electrically, this arrangement has low angle radiation and a good impedance match, because drooping the radials tends to raise the center impedance as compared to the approximately 30-ohm center impedance of the conventional ground plane antenna. This makes the center impedance of this array a pretty close match to the 50-ohm surge impedance of the RG8/U.

If one wants to worry about more exact figures, use 95% of a free-space quarter wave for the vertical section and 100% of a free-space quarter wave for the radial wires at your favorite frequency. For 10 and 11-meter operation cut the elements for 28 megacycles.

A lot of loading troubles can be eliminated and physically loose coupling between the antenna and tank coil maintained if series tuning of the antenna pickup coil is used. A small variable condenser of 50 or 75 $\mu\mu$f may be used as the voltage is low with up to medium power. On 10 meters the ordinary 2 or 3-turn coil usually has enough inductance to hit resonance within the range of the condenser. If resonance is not achieved with the plates fully in, a larger link or some added series inductance is in order. The added inductance or rather large pickup coil is certain to be needed on 20 meters.

BANDSPREAD FOR THE BC-348

(*from page 40*)

on noise to avoid image difficulties. When the mixer trimmer is adjusted, it will be necessary to retune the receiver slightly to retain the signal, since the mixer trimmer affects the oscillator frequency.

The matter of calibrating the new tuning ranges is left up to the individual. The simplest procedure is to prepare a chart or curve showing the important frequencies in the band concerned plotted against the corresponding settings on the band 5 or 6 dial plate. This method of calibration is employed occasionally in commercial communications receivers and has proven quite satisfactory for the author's requirements. The provision of more elaborate dial arrangements for the new frequencies is limited only by the ingenuity of the builder.

REFLECTION AT 144 MC

(*from page 36*)

tions were placed along the same azimuth, a station 20 miles removed in either direction could hear stronger or considerably weaker signals depending upon the distance of the DX station and the point of incidence. The situation is further complicated by the addition of the third dimension to this picture, spreading the inversion over a much greater area.

It is also to be noted particularly, that this warp-