Conducted by E. M. BROWN, W2PAU*

THE 1951 SPRING DX season is off to a good start, at the time of this writing. The closing weeks of April brought several good tropospheric band openings to the North Atlantic coastal states. A hint of what is yet to come this season is contained in the first stories of 420 mc DX from W2QED and K2AH. The 420 gang have spent many hours during the past winter improving their equipment and antennas in preparation for the coming season, and we predict that records will fall before many more months have passed. Auroral propagation was also noted on several occasions during the month of April. W4AO reports working W9EHX and W3NKM on two meters via the Northern Lights during the early evening hours of April 3rd. The boys at Cornell are still watching for auróra, and W2SNY, operating W2ZGP's six-meter transmitter, caught a typical opening into Wisconsin on the 21st. Their research program is providing valuable and hitherto undisclosed data on auroral propagation. The Aurora season should continue for several more weeks, and there is a good possibility that a good display, coming at a time when favorable tropospheric conditions prevail, might set the stage for a record-breaking v.h.f. contact. Sporadic E openings should be breaking out all over the country with increasing frequency any day now—remember June of 1949 and 1950? The W4's are pounding in on six meters as we type this column! Better get that six-meter rig all peaked up and ready, and start watching the band more closely!

VHF DX is being worked so frequently, of late, that there is a growing tendency to take it pretty much for granted. During the recent Massachusetts to Virginia two-meter opening, we noticed that there was a decided lack of the old fighting spirit among the participants. In years past, the high-powered gang vied with their VFO's for first crack at a rare DX station. The low-frequency end of the band used to be jammed with heterodynes and excitedly over-modulated carriers whenever a signal from beyond the 100-mile normal range broke through. Now, it seems, the tendency is for the "established" stations to either hook up with old acquaintances and chew the rag or to withhold their fire, meanwhile tuning carefully for some choice bit of DX that the rest of the gang cannot hear; for a new State to add to the "worked" list, or the like. We do not doubt that fear of TVI might influence some of the suburban dwellers away from high-powered operations during the early evening hours. There are some operators who simply leave their receiver tuned to the frequency of the local DX Champ. When he calls a station worthy of some extra effort, it is the cue to start serious operating! Some of the old timers resent the fact that they receive many calls from stations which are not real DX—these old-timers may have forgotten what a thrill it was when they made their first 200-mile contact using low power and perhaps an indoor antenna! Whatever the cause may be, it seems to us that the gang is not making the greatest use of their opportunities by following this sort of operating procedure. Let's hope that our impressions are not well-founded. If such operating practices are carried to an extreme, much of the thrill of VHF DX-ing may disappear.

It is a great source of satisfaction to have some new-comer to the band state that you are his best DX. Even though the signals from his flea-powered rig and dipole antenna are as hard to copy as those from better-equipped stations twice the distance away, the contact should be worth the effort. The incentive to work more and better DX is generally the reason why a newcomer to the v.h.f. bands continues to improve his equipment until he achieves the high degree of technical perfection that is commonplace today. We should help to provide this incentive wherever possible. Whenever we "sit out" a band opening we are not making the most of our opportunity to study the transmission characteristics of our v.h.f. bands. Need we point out that if it were not for the fact that W2NLY and W2BAV were both on deck and working DX on the evening of September 6, 1950, one of the finest West-East two meter band openings of the year might not have been detected!

We suggest that when you find the band in good condition, you should alert the local gang and try to get them on. Crank up all the power you dare to use, and get on the air and work stations. Try to keep the QSOs short and snappy, even though the urge to chew the rag may be strong. Follow a regular tuning procedure that will insure your tuning across the entire band, and announce your intentions to tune from a certain frequency

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Associate Editor, CQ. Send contributions to E. W. Brown, 88 Emerald Avenue, Westmont, Collingswood 7, New Jersey.

in a specified direction. Answer *all* stations you hear calling you—no matter how strong or how weak they may be. Call frequent (but snappy) CQs when you run out of stations to call. We think it is best to operate consistently on one spot frequency rather than to use VFO tactics. VFOs are fine to break in on a particular station in the least possible time, but for normal DX working, it is a great help to know exactly where to listen for a station—his "spot" in the band becomes well-known. Log the frequencies of all stations worked; this data will come in handy during future openings.

By following these general operating practices, one should be able to work the maximum possible numbers of stations during a given band opening, and, by so doing, work all the DX that's worth working at the same time. By encouraging beginners to improve their equipment and by demonstrating to the skeptics that there are still plenty of active stations on the band, we can insure a continued high level of activity.

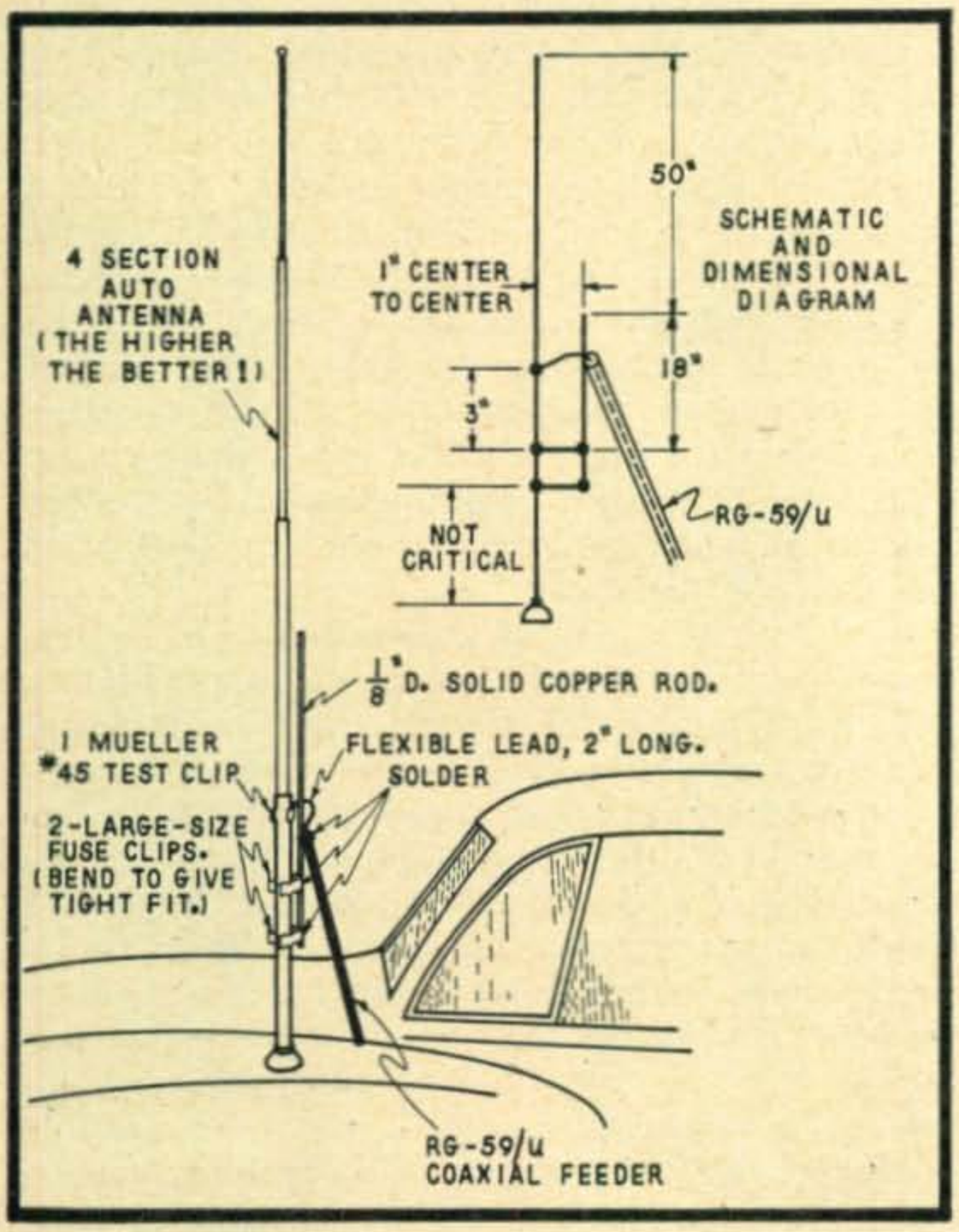

Fig. 1. The "clip-on J" 2-meter mobile antenna

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In our column for May, 1951, we reported on an early-March 144 mc band opening between Texas and Illinois, and gave credit to "The VHF News" as our source of the story. By one of those all-too-frequent slips of the type our version of the story had W5QNS listed as one of the stations active during this opening. The original version, as printed in "The VHF News" showed the correct call, W5QNL. We hereby apologize to Editor McNatt and to W5QNL for our error.

While we are on this subject, it has been called to our attention that an item in our column for April, 1951, might have been construed as an attempt to discredit the "News" for publishing "an exaggerated report" . . . . We regret that what was intended as a friendly jest may have been misinterpreted. W9NFK is doing a thoroughly commendable job in editing and publishing his monthly paper. There has never been any friction between us, and we'd hate to have any develop. As every dyed-in-the-wool v.h.f. man knows, our particular phase of the radio hobby thrives best when there is a free interchange of ideas and a wide dissemination of news items from all sections of the v.h.f. world. We all owe a vote of thanks to Bill McNatt, W9NFK, for his share in bringing this about.

(That last paragraph contains a big hint. Postal cards still cost only a penny, and you can get a lot of news on one if you try. What's the matter—don't you guys like to see your names in print?)

A Simple but Effective 2-Meter Mobile Antenna

Many of the two-meter mobileers are operating with improvised antennas envying the more fortunate hams who wield sufficient authority to chop a hole in the roof of the family chariot. The quarter-wave vertical whip in the center of the car top seems to be the standard antenna for the v.h.f. mobile services, and as such has achieved more popularity than it might deserve. It may come as a surprise to some to learn that the famous 18" vertical is theoretically and practically inferior to the much-maligned straight dipole!

Although several hams have discovered that a conventional cowl-mounted auto radio antenna can be used with some success on 144 mc when fed at the base with its standard length of low-capacitance co-axial cable (which is designed specifically to feed into a broadcast receiver,) there is danger that the cable and the antenna mount may not be properly insulated for v.h.f. use. Because an appreciable part of the radiating section of the antenna lies below the level of the car roof, unwanted directional characteristics may result.

W2JAV, W2OQN, and others have noted that the familiar "J" antenna does a creditable job in a mobile installation. Although the "J" possesses the undesirable property of radiating a certain amount of energy from the un-balanced bottom stub which tends to raise the effective angle of radiation slightly, the effect of this radiation seems to be negligible compared to the shortcomings of other simple antenna systems. The fact that the radiating section of the "J" is located above the plane of the car roof probably makes up for its inherent defects. Comparative tests made by W2PAU show that a "J" on the new Plymouth performs as well as any of the practical mobile antennas we have used to date. (Some will say that the new car has less ground-current losses than the old one, but gosh, the top wasn't *that* rusty!) The "J" is almost the equal of the 5/8-wave vertical whip mounted in the middle of the roof—the best antenna tested to date!

Figure 1 shows our version of the "clip-on J". Although there are any number of combinations

of stub-length, feeder tap position, and radiator length which will produce a matched antenna system, the set of dimensions finally selected were based on a radiator length slightly greater than 1/2 wavelength. The height of the base of the "J" above the fender top had no appreciable detuning action. The dimensions chosen were those which gave a standing-wave ratio of 1:1 at the operating frequency of 147 mc. All dimensions should be multiplied by the ratio of 147 to the desired frequency (in megacycles) to obtain comparable performance at some other frequency.

The RG-59/U 75-ohm coaxial feed line was fed through a convenient crack between the hood and the fender, so no surgery except that necessary to secure the BC antenna was required. The feed line for the BC set is left attached, so by unclipping the "J" stub, normal low-frequency operation can be restored. In fact, if the v.h.f. feeder is link-coupled to the transmitter and the receiver, and if its outer shield is not grounded, simultaneous v.h.f. and l.f. operation can be achieved, since the small capacitance of the two-meter feed line to ground does not appreciably short-circuit low-frequency signals.

While we are on the subject of antenna systems, here is a description of one which we thought was unusual enough and had sufficient practical merit to justify passing it along:

The Folded Collinear--A VHF Array

by

Neal H. Brown, W7SLO*

This antenna was developed with the idea of obtaining greater gain than is possible with the usual arrangement of straight dipole elements, at the same time retaining the virtues of simple all-metal construction. Means for matching to a wide range of feeder impedances are provided directly in the antenna proper without the need for external transformers or stubs. Each basic element has excellent signal-pickup efficiency, approximately equal to that obtained from the usual "three-half-waves, in phase" array. These elements can be combined to form larger arrays, in much the same manner that single dipole elements are combined in driven phased arrays or parasitic configurations.

The term "pickup efficiency" may require a word of explanation. A half-wave dipole antenna cut for 420 mc is just as efficient a transmitting radiator as a half wave antenna is on ten meters. But it is very apparent that the half wave dipole on 420 with a physical length of only about 12 inches cannot extract anything like the same amount of energy on receiving as does a 10-meter dipole, with a physical length of 16 feet. In order to improve the pickup efficiency of our v.h.f. arrays we must increase their effective length.

The collinear type of antenna seemed to have most of the characteristics we were looking for, but it presented quite a mounting problem, even where only two elements were involved. Use of more than two elements called for the use of some kind of phasing stubs, which are difficult to support, and if insulating spacers are used across the stubs or at the feed point, their losses may be high.

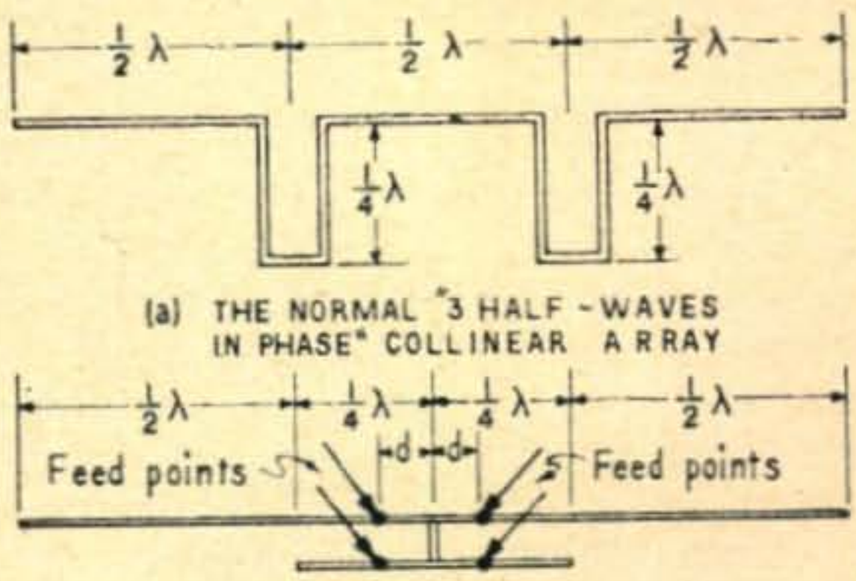
Looking for a simplified method of mounting, we hit upon the idea of forming the center section of the familiar three-half waves-in-phase array by folding back the usual phasing stubs onto the center dipole. The resulting arrangement might also be visualized as two "J" antennas butted end-to-end, with the two quarter-wave stubs forming the support and insulating system. Figure 2 shows the idea.

We now have two half wave dipoles, with their centers spaced a full wavelength apart. When fed with equal currents these two elements will provide a field pattern about the same as the usual three-dipole configuration. The center point of the system is at ground potential, and therefore may be mounted directly on a supporting structure without insulation. The quarter-wave stubs provide a variable impedance matching system for any type of feed line one might wish to use. Close to the shorting bar the stub impedance is very low, but as the tap point is moved out toward the end of the stub the impedance rises to several hundred ohms. The symmetry of the system makes it possible to feed with a symmetrical feeder harness and thus insure that equal currents are set up in both sides of the array.

One of these collinear sections can be backed up by a reflector system, to provide a directional array in much the same manner that a parasitic element is added to a simple dipole to form a beam antenna. It is suggested that in the interests of ease of assembly the reflector system be made exactly the same as the driven element. (Some fine tuning may be required in order to attain the best possible front-to-back ratio.) In a multi-section array of this type it seems preferable to place the half-wave section which forms the stubs directly in front of the driven element— in the direction of transmission.

At W7SLO, four of these sections are employed

Figure 2



*516 McMillan Drive, Tucson, Arizona

in a stacked array for 420 mc. This array shows exceptional gain and good directional characteristics. All-metal construction is employed. The supporting mast and booms were drilled to provide a snug fit for the cross members, then all joints were brazed, using aluminum brazing rod and a special flux marketed especially for low-temperature work. If brazing equipment is not available, the conventional methods of assembly could be used just as well, provided that low-resistance joints are provided at the element mounting points.

The general layout of the array is shown in figure 3. Exact constructional details are not given, as it is assumed that every ham who wishes to duplicate this system will attempt to work out his own version of the design to suit the space and type of material on hand.

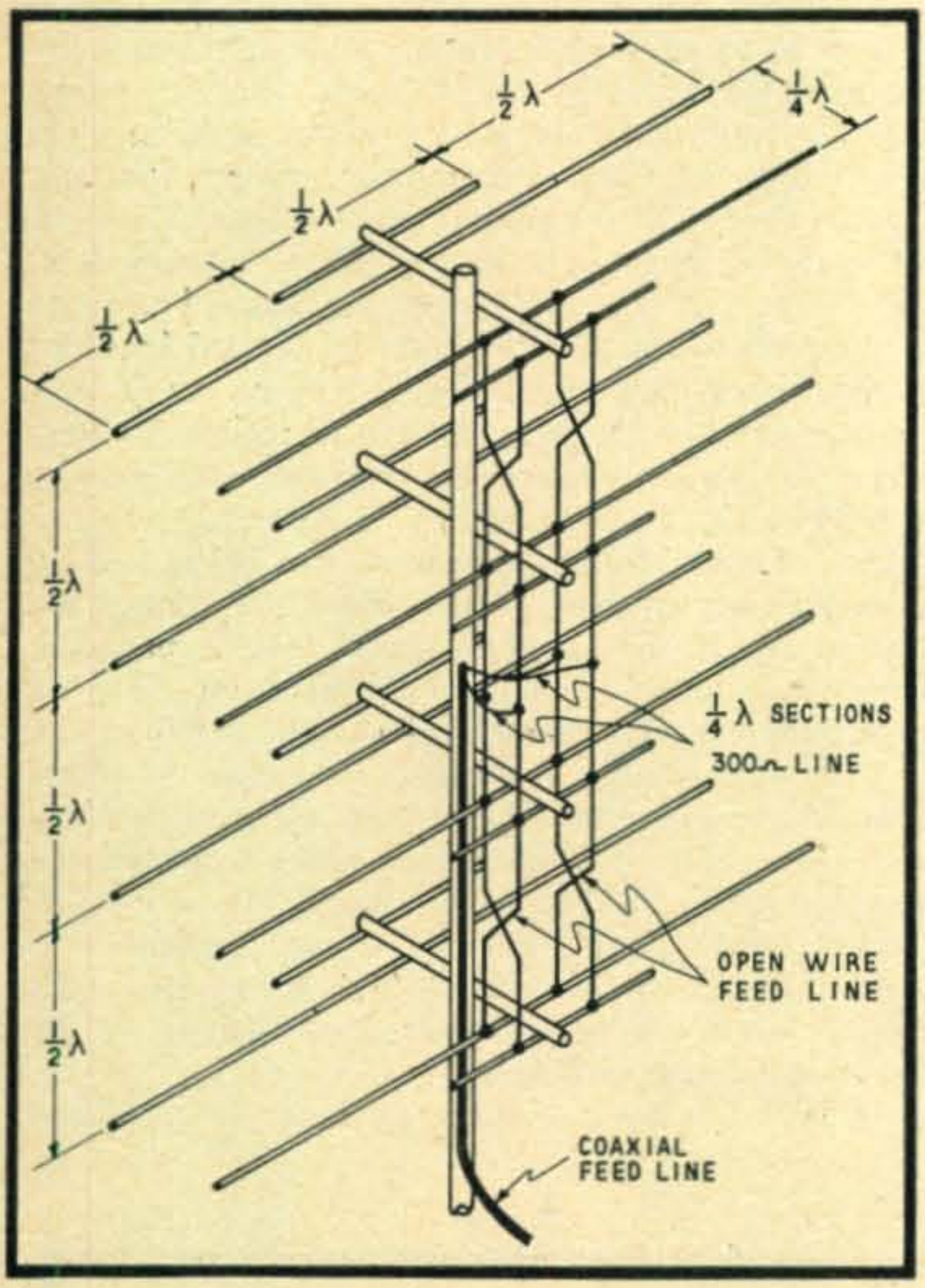


Fig. 3. W7SLO's array of "folded colinear" elements

The directional characteristics are shown in the plot of figure 4. The half-power beam width is approximately 30 degrees. For the "four-stacked" model, horizontally polarized, the vertical beam width is approximately equal to that of the usual 16-element array, or about 30 degrees. This pattern should give an effective gain of about 15 db, but in actual tests made on the air, the apparent gain ran much higher—in the order of 20 db! The minor lobes which show up at the 60° points are not objectionable. The band-width of the array is sufficiently great to include the entire 420 mc band, an dthe element lengths are not especially critical.

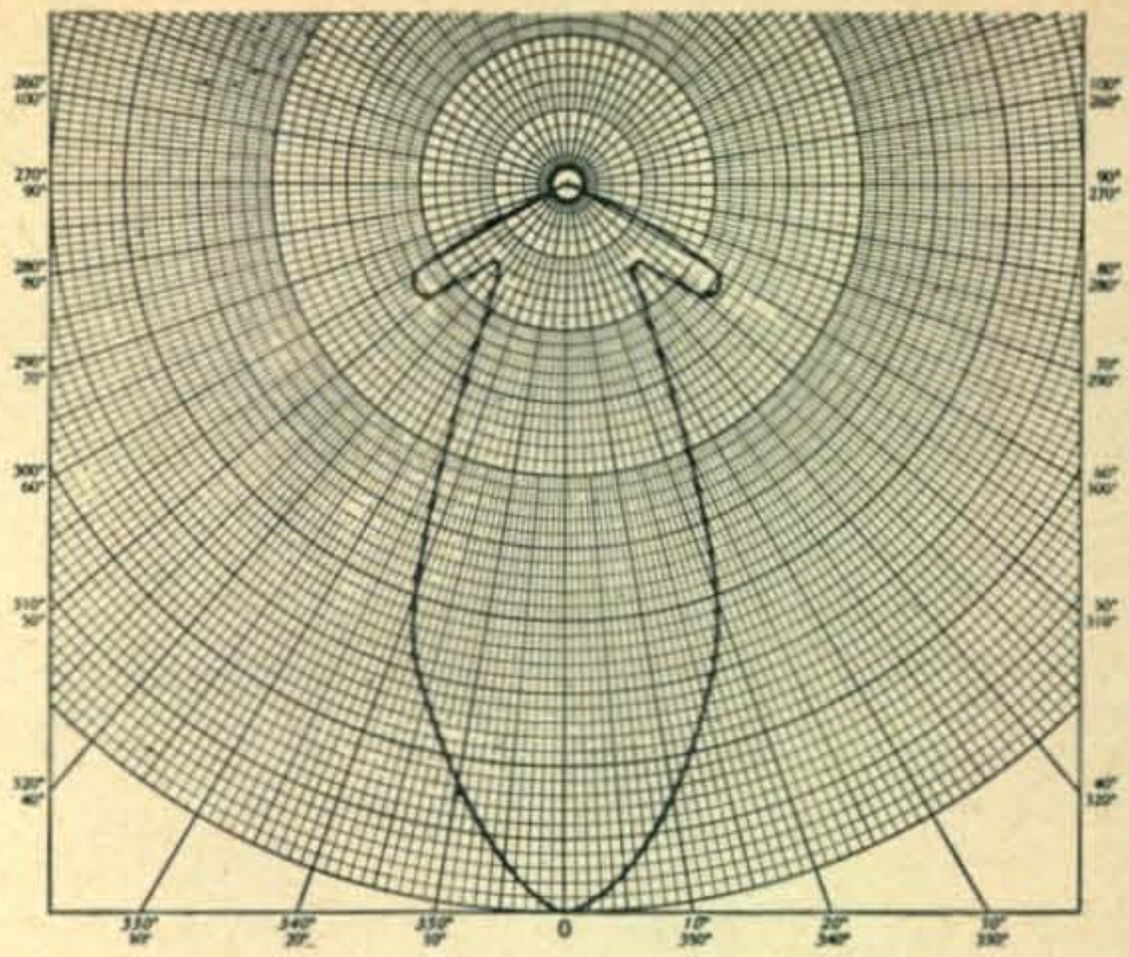


Fig. 4. Approximate pattern of W7SLO's 420 mc beam, in terms of relative voltage.

"Worked All Rochester Award"

The Rochester, N. Y., VHF Group announces a new award, designed to stimulate interest in operations on the bands above 50 mc. Known as the "Worked All Rochester" or "WAR" certificate, it will be issued to any amateur who works a large percentage of the total number of v.h.f. stations active in the Rochester area. For the purposes of this award, Rochester stations are defined as those fixed stations located within 25 miles of the center of the city.

You are eligible for the award if you are located within 25 miles of the center of Rochester and have worked 25 or more Rochester v.h.f. stations since Jan. 1, 1949 from a single fixed location; or, if you are located more than 25 miles airline from the center of the city and have worked 15 or more such stations during the same period. Full details can be obtained from the award committee, which consists of Hank Blodgett, W2UTH, Roger Williams, W2NES, and Ken Evans, W2UAD, who is Chairman of the Rochester VHF Group.

The boys have plenty of these certificates to give away, so point your beam at Rochester and line 'em up! They would like to see other v.h.f. groups around the country follow suit, to give them something to shoot for.

(Continued on page 50)


DATED April 10, 1951 — NUMBER 1

SAMPLE COPY — SAMPLE COPY

WAR

WORKED ALL ROCHESTER

2 METER AWARD

THE ROCHESTER VHF GROUP ORGANIZED IN 1948 TO FURTHER INTEREST AND ACTIVITY OF THE FREQUENCY SPECTRUM ABOVE 50MC.

SAMPLE

THIS CERTIFICATE IS AWARDED TO W2UTH-Henry A. Blodgett FOR CONTACTING . . . AMATEURS IN ROCHESTER, NEW YORK SINCE JANUARY 1, 1949 ON FREQUENCIES OF 50 MC. OR HIGHER.

SIGNED Kenneth W. Evans, W2UAD

Chairman Rochester VHF Group

rectifier toob? The kind with the steel jacket about a quarter-inch thick? Kicked it when you are wearing bedroom slippers? Well, don't doing it, unless you wanting to practise up on how to use crutches. The doctor says I'll be able to get my right foot into my shoe in about another week.

Respectfully yours,
Hashafisti Scratchi

VHF-UHF

(from page 42)

Tropospheric Blobs?

In answer to our request for reports on the effect of antenna "tilting" on long-range v.h.f. contacts comes a report from GM3DIQ, Ayrshire, Scotland. While testing out a 144-mc 16-element stacked array (which appeared to have at least the usual gain on local contacts) he was surprised to receive a report from GM3FOW that he was 2 or 3 S-units weaker with this array than with the simple 4-element Yagi that had been used before. On the hunch that this might have been caused by differences in the vertical radiation pattern of the two arrays, GM3DIQ constructed a five-over-five array with full wave spacing, and made provision for tilting it upward. When the new array was directed toward the horizon, GM3FOW reported the signal was still S6, the same as with the 16-element beam. However, when the beam was tilted about 6 degrees above the horizontal plane, the report was changed to S9-plus!

On subsequent tests made with other stations GM3DIQ found that the tilted array provided noticeably better reports than the "level" job. These tests were made in relatively hilly country, at distances from 12 to 70 miles. He concludes that the results seemed to show that there is an optimum angle of radiation for varying distances and conditions. He does not believe that this is due to tropospheric scattering. Any other opinions?

Miscellany

W7QLZ of Phoenix, Arizona, has his heart set on working into California on two meters. Ol' Clyde has been running serious schedules with the W6 gang, at various times of day between 0400 and 2100. He has boosted the power of his rig to 400 watts on cw and 250 watts on phone. A new beam has been added. To date, the best that can be told is one case of reported reception of W7QLZ's signals by W6HZ, of Los Angeles. This is a hop of about 360 miles, over some of the toughest terrain that this country has to offer. W7QLZ is still in the mountain-top expedition business. On the 22nd of April he travelled to Pioneer Pass, about 15 miles SE of Globe, Arizona. No rare DX was caught, but some nice QSOs were held on two meters with W7NVN and W7FGG of Tucson, 80-odd miles away, despite the fact that the 9,150-foot peak of Mount Lemon lay directly in the path. The 420 mc signals couldn't be persuaded to bend around the mountain.
