QST

devoted entirely to

amateur radio

November 1953
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*Patent No. 2,350,010
They're brand-new....
space-savers....
long-lived, with
stable performance

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BEST YET FOR YOUR COMPACT NEW RIG!
If you're not using transistors already,
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2N43
with high gain

2N44
with medium-to-high gain

2N45
with medium gain

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Only those amateurs will be eligible whose names are submitted to
the judges by letter. Terms of the Award were published on this page
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has rendered important service....and your cooperation will help
build wider recognition of the valuable work which all amateurs are
doing in the public interest.

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A self-contained table-top transmitter

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NEW YORK 36 BURBANK DALLAS 2
CONTENTS

TECHNICAL —
An Amateur Television Camera
  John W. Keller, jr., W3NDB 10
 Tube-Keyed Grid-Block Keying
  A. R. Williams, VE3BSH 16
 A Simple Heterodyne Exciter for 10 Meters
  Charles Faulkner, W6FPV 21
 The Single Side-Saddle Linear
  Carl W. Eckhardt, W7BBK 25
 Color Television and the Amateur
  George Grammer, W1DF 31
 A 220-Mc. Station for the Beginner — PART II
  Edward P. Tilton, W1HDQ, and Mason P. Southworth, W1VLH 35
 A Coaxial Antenna for Ten Meters
  Harry M. Neben, W9YVZ 40

MOBILE —
Compact R.F. Assembly for 50- and 144-Mc. Mobile
  C. Vernon Chambers, W1JEQ 17

NOVICE —
Novice 80- and 40-Meter One-Tube Rig
  Lewis G. McCoy, W1ICP 28

OPERATING —
Announcing the 20th ARRL Sweepstakes .......... 46
CE9AA .................. 58

GENERAL —
"I Have Observed All the Rules. . . ."
  Charles L. Wood, W2VMX 48

Hams (poem) .............................................. 134

"It Seems to Us . . . ." ......................... 9 How’s DX? ......................... 59
Our Cover .................................. 15 The World Above 50 Mc. .... 63
Quiz Quiz ................................. 16 Hamlet Calendar .............. 67
Technical Correspondence .................. 39 United States Naval Reserve .. 67
On the Air with Single Sideband ............ 42 Military Affiliate Radio System 67
Happenings of the Month ..................... 44 Silent Keys ......................... 67
YI News and Views ......................... 49 Operating News ................ 68
Hints & Kinks .................................... 51 With the AREC .............. 72
He Makes What We Hams Use .............. 54 ARRL QSL Bureau ................. 76
Correspondence from Members ............. 56 Station Activities ............ 76
In QST 25 Years Ago ................... 112

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INDUSTRIAL ARTS INDEX
Check the specs...  
Check the performance...  
AND YOU’LL CHOOSE

Do you know any better way, any other way, to judge SW equipment than to check the specifications and the performance? Frankly that’s the only valid way we can think of to make sure you get your money’s worth. Check these specs. Take a look at the selectivity curve for the S-76. It is typical of the outstanding value Hallicrafters offers in every price class.

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Double conversion receiver. Broadcast Band 538-1580 kc plus three short-wave bands covering 1720 kc-34 Mc.

Calibrated electrical bandspread for easy tuning. Double superhet with 50 kc second i-f and giant 4-inch “S” meter. Five position selectivity, one r-f, two conversion, two i-f stages, temperature compensated. 3.2 or 500 ohm outputs.

Satin black steel cabinet. 18½” x 8½” x 9½” deep. Nine tubes, plus voltage regulator and rectifier.

For 105/125V. 50/60 cycle AC  $199.95
Use R-46 speaker . . . .  $199.95

Built-in Narrow Band FM one r-f, two conversion, and three i-f stages. Temperature compensated, voltage regulated. Three watt output (terminals for 500 and 3 ohms).

Satin black steel cabinet. 18½" x 8½" x 12" deep. Eleven tubes plus regulator, rectifier.
For 105/125 V. 50/60 cycle AC....$249.95

Model HT-20. T.V.I. suppressed 100 watt AM-CW transmitter with all spurious outputs above 40 Mc at least 90 db. below full rated output.

All stages metered; single meter with eight position meter switch; output tuning indication. Frequency range of 1.7 Mc to 31 Mc continuous on front panel control. Seven tubes plus five rectifiers.
For 105/125 V. 50/60 cycle AC......$499.50

Models S-40B, S-77A. Covers Broadcast Band 540-1680 kc plus three short-wave bands covering 1680 kc-44 Mc.

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S-77A Same, for 105/125 V. AC/DC 32 lbs. ...............$129.95

Model R-46. Matching 10" PM speaker for use with Hallicrafters communications receivers SX-71, SX-76, SX-73 or SX-62. 80 to 5000 cycle range. Matching transformer with 500-ohm input. Speaker voice coil impedance, 3.2 ohms.

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### Section Communications Managers of the ARRL Communications Department

<table>
<thead>
<tr>
<th>Region</th>
<th>State/Province</th>
<th>AMArlington</th>
<th>Box</th>
<th>City</th>
<th>State/Province</th>
<th>AMArlington</th>
<th>Box</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ATLANTIC DIVISION</strong></td>
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<td></td>
</tr>
<tr>
<td>Eastern Pennsylvania</td>
<td>W8EHU</td>
<td>204, Box 144</td>
<td></td>
<td>Pottstown</td>
<td>Reading, PA</td>
<td>2087, Box 18, 14th St.</td>
<td></td>
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</tr>
<tr>
<td>Maryland-Deleware-D.C.</td>
<td>W8OKK</td>
<td>3804 Kemmerer Rd</td>
<td></td>
<td>Palmyra</td>
<td>Reading, PA</td>
<td>2087, Box 18, 14th St.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern New Jersey</td>
<td>K2BG</td>
<td>808 Lincoln Ave.</td>
<td></td>
<td>Toms River</td>
<td>Reading, PA</td>
<td>2087, Box 18, 14th St.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western New York</td>
<td>W8JZV</td>
<td>81 King St.</td>
<td></td>
<td>Toms River</td>
<td>Reading, PA</td>
<td>2087, Box 18, 14th St.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Pennsylvania</td>
<td>W8JCD</td>
<td>RFD 1</td>
<td></td>
<td>Toms River</td>
<td>Reading, PA</td>
<td>2087, Box 18, 14th St.</td>
<td></td>
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</tr>
<tr>
<td><strong>CENTRAL DIVISION</strong></td>
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<tr>
<td>Illinois</td>
<td>W9KOL</td>
<td>1315 S. 5th St.</td>
<td></td>
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<td>Fort Wayne 6</td>
<td></td>
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<td></td>
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<tr>
<td>Indiana</td>
<td>W8BKH</td>
<td>824 Home Ave.</td>
<td></td>
<td>Springfield</td>
<td>Fort Wayne 6</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Michigan</td>
<td>W9JORM</td>
<td>929 S. 7th Ave.</td>
<td></td>
<td>Spring Lake</td>
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<tr>
<td>Minnesota</td>
<td>W8MIXC</td>
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<tr>
<td><strong>DELAWARE DIVISION</strong></td>
<td>W8VKR</td>
<td>1527 Fifth Ave., No. 1</td>
<td></td>
<td></td>
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<tr>
<td>North Dakota</td>
<td>W8VRK</td>
<td>1900 South Mead Ave.</td>
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<tr>
<td>South Dakota</td>
<td>W8VRK</td>
<td>Charles B. Hall</td>
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<tr>
<td><strong>GREAT LAKES DIVISION</strong></td>
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<tr>
<td>Arkansas</td>
<td>W5UX</td>
<td>520 South Maple St.</td>
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<td>Harrison</td>
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</tr>
<tr>
<td>Indiana</td>
<td>W8CLI</td>
<td>4040 W. 50th St.</td>
<td></td>
<td>Indianapolis</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>W8TD</td>
<td>Dr. A. J. Burke</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Michigan</td>
<td>W4ME</td>
<td>109 Dixie Lane</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ohio</td>
<td>W8UV</td>
<td>415 E. Mc Vermont St.</td>
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<tr>
<td>Michigan</td>
<td>W8MIO</td>
<td>3927 Clague Rd.</td>
<td></td>
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<tr>
<td><strong>Hudson Division</strong></td>
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<tr>
<td>Maine</td>
<td>W1HVF</td>
<td>794 River St.</td>
<td></td>
<td>Troy</td>
<td></td>
<td></td>
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<tr>
<td>Massachusetts</td>
<td>W1AFT</td>
<td>117 Harvard St.</td>
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<tr>
<td>New Hampshire</td>
<td>W1JH</td>
<td>410 6 Fifth Ave.</td>
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<tr>
<td>Rhode Island</td>
<td>W1RH</td>
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<td>Vermont</td>
<td>W1RNA</td>
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<tr>
<td>Iowa</td>
<td>W8PA</td>
<td>566 S. 4th Ave.</td>
<td></td>
<td>Mitchellville</td>
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<tr>
<td>Kansas</td>
<td>W8PV</td>
<td>624 Roosevelt</td>
<td></td>
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<tr>
<td>Nebraska</td>
<td>W8PB</td>
<td>1024 South Jefferson Ave.</td>
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<tr>
<td><strong>NEW ENGLAND DIVISION</strong></td>
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<td>New Hampshire</td>
<td>W1LII</td>
<td>203 W. 8th St.</td>
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<td>Pembroke</td>
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<td>Massachusetts</td>
<td>W1AFT</td>
<td>1065 Boston Ave.</td>
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<td>Rhode Island</td>
<td>W1HVF</td>
<td>108 Sias Ave.</td>
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<tr>
<td>Vermont</td>
<td>W1RNA</td>
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<tr>
<td><strong>NORTHWESTERN DIVISION</strong></td>
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<tr>
<td>Alaska</td>
<td>K7LNT</td>
<td>918-6th Ave.</td>
<td></td>
<td>Anchorage</td>
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</tr>
<tr>
<td>Idaho</td>
<td>W8WY</td>
<td>2105 Irene St.</td>
<td></td>
<td>Billings</td>
<td>Everett</td>
<td></td>
<td></td>
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<tr>
<td>Montana</td>
<td>W7KCG</td>
<td>426 Yellowstone Ave.</td>
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<tr>
<td>Oregon</td>
<td>W7BUS</td>
<td>108 Box 106</td>
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<tr>
<td>Washington</td>
<td>W7CSV</td>
<td>Route 2, Box 384</td>
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<td><strong>Pacific Division</strong></td>
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<td>Hawaii</td>
<td>W8GKS</td>
<td>7439 Kailua Dr.</td>
<td></td>
<td>Honolulu 17</td>
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<tr>
<td>Nevada</td>
<td>W7IU</td>
<td>539 Birch St.</td>
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<td>Boulder City</td>
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</tr>
<tr>
<td>Santa Clara Valley</td>
<td>W7JU</td>
<td>1668 Englewood Blvd.</td>
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<td>Allentown 6</td>
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<td></td>
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<tr>
<td>East Bay</td>
<td>W8JZ</td>
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<td>San Francisco</td>
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<tr>
<td>San Francisco</td>
<td>W8GK</td>
<td>16 Colonial Way</td>
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<td>San Joaquin Valley</td>
<td>W8GW</td>
<td>421 East Olive St.</td>
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<td><strong>Rocky Mountain Division</strong></td>
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<td>Colorado</td>
<td>W8CDX</td>
<td>1945 Keswick St.</td>
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<td>Denver</td>
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<tr>
<td>Utah</td>
<td>W8DXY</td>
<td>165 6th Ave., North</td>
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<tr>
<td><strong>SOUTHWESTERN DIVISION</strong></td>
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<tr>
<td>Alabama</td>
<td>W4JW</td>
<td>432 Woodard Blvd.</td>
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<td>Birmingam</td>
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<td></td>
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<td></td>
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<tr>
<td>Eastern Florida</td>
<td>W4FWZ</td>
<td>3809 Springfield Blvd.</td>
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<tr>
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<td>W4MV</td>
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<tr>
<td>Georgia</td>
<td>W8G0L</td>
<td>25 First Ave., N.E.</td>
<td></td>
<td>Atlanta</td>
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<td>West Indies (Cuba-P.R-V.I.)</td>
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<td>Box 373</td>
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"It Seems to Us..."

TVI — COLOR...

We want to direct the attention of every reader of this issue of *QST* to the article on color television interference potentialities beginning on page 31.

The story is about a complex subject; it can't be told in a few paragraphs. Before we could write it, it also cost thousands of the dollars we members put into the League and that, additionally, we garner in the course of our normal business operations. But we can't think of a better example of why we need a League — the experience that inevitably goes with it, and the ability and contacts to do something about it. It is a story that vitally affects every active amateur.

Now to it:

The machinery which over the past few years has been set up to combat TVI problems, through the joint efforts of amateur radio and FCC, with industry co-operation, has been running pretty well of late, with only an occasional shot of oil needed now and then. But in a field as fast-moving as electronics, nothing is truer than the old adage: You have to run to stand still. And so it is that this year we have come face to face with some new problems of TVI — whose exact potentialities remain unknown but may be formidable.

One is color TV. In the compatible electronic color system certain to be approved by FCC, obviously a TV signal has to be more complex — in addition to the sound channel and basic monochrome information, the carrier has to include also "instructions" to the picture tube as to what colors to produce in what portions of the screen at what intensity and at what hue. The modulation processes therefore become extremely intricate, requiring the use of subcarriers to convey additional information. What gave us no little concern earlier this year is that one frequency involved is approximately 3580 kc. There are good and sufficient engineering reasons why this spot is the logical one; and we want to make it plain that no transmission on 3580 kc. is contemplated — the frequency is only one of many which will be running around in the receiver innards. But two serious questions arose — what are the potentialities of amateur 80-meter operation ruining a near-by color picture, and what are the expectations for interference to amateurs from receiver radiation?

Early this year the League addressed the industry group which was setting up proposed standards for color TV, the National Television Systems Committee, warning of possible complications and asking that the matter be given full consideration before proposed standards were finally determined. The response, through NTSC Chairman W. R. G. Baker, was immediate and heart-warmingly cooperative — a special committee was appointed with the sole job of examining the problem as we set it forth. This group held a series of meetings and conducted a number of tests at several cities in the Northeast; for its part, ARRL Hq., designed and built special gear and bought a station wagon to cart it around (there are only a few color receivers in existence, and we had to go where they were). For ARRL it was an effort representing both considerable money and time; we had to take several of our people from their usual jobs and put them to work for months on this particular problem, virtually to the exclusion of *QST*, the *Handbook* and other activities. The results of the committee study, now embodied in NTSC's documents filed with FCC, are encouraging, saying principally: "the real solution to the bilateral... problem lies in suitable receiver design."

The tests have been extremely useful not only in furnishing technical data, but in bringing forcibly to the attention of manufacturers, before designs are finalized, of the need for adequate consideration of the potential interference problem. They are also a shining example of how an advance cooperative endeavor can save us all a lot of headaches later on.

... AND STRIPS

The second problem is a newer one, showing up in some of the uhf. channels and being peculiar to receivers converted for those frequencies by means of inserted channel strips. These gadgets use a dual-conversion system (instead of the single conversion recommended by FCC) and the trouble is that many of the new first intermediate frequencies thus set up fall close enough to the 144-Mc. band so that amateur 2-meter operation can completely disrupt the picture; the makeshift design simply doesn't provide any protection for signals riding in on the i.f.

The League has therefore requested FCC, in instances of such interference, to make it (Continued on page 64)
An Amateur Television Camera

BY JOHN W. KELLER, JR.,* W3NDB

The usual drawbacks to the building and operation of a television camera are the expense of the pick-up tube, the complicated and complex magnetic deflection and focusing circuits, and the need for keystone and shading correction in the case of an iconoscope tube. These drawbacks can be eliminated in the construction of an amateur television camera by the use of the RCA type 5527 iconoscope tube.

The 5527 is a two-inch iconoscope with a definition capability of 250 lines. It uses electrostatic deflection and electrostatic focus, and the need for keystone and shading correction is eliminated by a type of mosaic construction that permits the use of a straight-sided tube. An inexpensive short focal-length lens can be used.

While some may feel that the 250-line definition is not sufficient, let me point out that the pictures are excellent and that only by using a monitor receiver with a picture tube of the 16-inch size or larger does the line structure become noticeable. Although the pictures are not interlaced, they can be received on a conventional television receiver which will lock in on the blanking pulses.

The amateur camera system described here consists of the following units: camera chassis, synchronizing and blanking chassis, and power-supply chassis.

The Camera Unit

As the heart of any television system is the camera, special care should be given to its construction. The camera chassis shown in the photographs contains the iconoscope tube and its lens system, the video preamplifier stages, and the high-frequency peaker stage. The video preamplifier stages and the high-frequency peaker stage, Fig. 1, use Type 6AG5 tubes. No noticeable increase of gain or signal-to-noise ratio was realized by using 6AK5s in place of 6AG5s. Since the signal output from the iconoscope tube is very low, it is necessary to use four video preamplifier stages to increase the level to a value sufficient to feed through coax cable to the video line amplifier, which is located on the synchronizing and blanking chassis.

The output capacity of the iconoscope is shunted across the input of the video preamplifier, so it is necessary to compensate the preamplifier for the loss of high frequencies. This is accomplished by operating the video high-frequency peaker stage and the third video preamplifier stage in series. The 100-µfd. capacitor from the cathode of the third video preamplifier stage by-passes the high frequencies, causing the stage to have more gain for the high than for the low frequencies. This type of high-peaker stage is very stable and quite free from microphonic effects. The amount of high-frequency compensation is set by adjusting the 50,000-ohm potentiometer in the plate circuit of the 6AG5 high-peaker stage. This adjustment is best made by adjusting the control to eliminate a black streak following a black bar on a white background. The control should be set so that the streak is just eliminated, and not moved far enough to cause overcompensation.

As the cathode of the 5527 iconoscope tube is operated at a high negative voltage above ground, it is necessary to use a separate filament transformer for this tube. This transformer is located on the synchronizing and blanking chassis to reduce the possibility of

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*135 No. 11th St., Sunbury, Penna.
Fig. 1 — Camera preamplifier circuit. Resistors are \( \frac{1}{2} \) watt unless otherwise indicated. Capacitance values in \( \mu \)F except as indicated. Socket is for incoming power.

Fig. 2 — Socket connections on camera chassis for iconoscope. Six-prong socket at left is for incoming sweep voltages. 5-prong socket at right for iconoscope power supply. The blanking input connector is a coax fitting.

Fig. 3 — Detail of the iconoscope and lens mounting.

Bottom of the camera-unit chassis. The principal constructional point to watch out for is to keep stray capacitance low in the “hot” video circuits to prevent loss of high-frequency response.
Fig. 4 — Blanking and sync generator circuit. Top section, vertical oscillator and sweep amplifier; middle section, blanking mixer, clipper and amplifier; lower section, horizontal oscillator, shaper, and amplifier. Fixed resistors 1/4 watt, capacitance values in μf, unless otherwise indicated. The inset diagram at the upper right is the high-voltage switching arrangement; when in the off position, the high-voltage filter is discharged through the 220K resistor.

Fig. 5 — Video line amplifier diagram. The frequency response of this circuit is substantially flat from 60 cycles to 2.5 Me. L₁ and L₂ are adjustable peaking coils. 44-66 μH. Noninductive resistors should be used in the plate circuit of the 6AG7. A later modification, which improves the shape of the vertical blanking pulse, is to substitute a 10-μf, 25-volt electrolytic condenser for the 0.25-μf condenser between the 6SN7 cathode and 6AG7 grid. It should be mounted well away from the chassis to prevent loss of high-frequency video.
its magnetic field affecting the iconoscope tube. The camera is built on a 7 × 13 × 2-inch chassis with a bottom plate. The bottom plate is very necessary for shielding — without it, the wiring picks up a strong signal from the local broadcast station, thereby causing interference in the picture. Two five-prong sockets are used to connect the necessary voltages to the camera unit, and the sweep voltages are fed in through a six-prong socket. Regular coax cable connectors are used for the blanking signal input and the video output of the camera.

The interconnecting cables between the camera and the synchronizing and blanking chassis are made up as follows: For the 325-volt B+, the 150-volt negative voltage, and the heater supply, a cable of five wires is used; for the control voltages and heater voltage of the iconoscope tube, a five-wire cable; for the vertical and horizontal sweep voltages, a five-wire cable. The cable-socket connections are given in Figs. 1 and 2.

It may be wondered why shielded cable was not used for the sweep voltages; this was tried, but because of the capacitive effect of the shielded cable, the 15,750-cycle horizontal sawtooth voltage was distorted. This resulted in a nonlinear picture. As the sweep voltages are relatively high, the unshielded cable worked well, and if the length is not excessive there is no need to worry about using shielded cable.

The first video amplifier stage is connected to the signal electrode of the 5527 iconoscope tube by a low-capacity shielded lead, made up by using a small-diameter lead shielded by braid having a rather large inside diameter.

The peaking coils used by the author were standard 117-microhenry units used in Motorola television sets. The new adjustable-type video peaking coils can be used if desired. These can be adjusted to the correct value needed for best

The sync and blanking generator. This unit also contains a video line amplifier. Controls are as follows: top row, left to right—intensity, focus, high-voltage switch; second row—vertical centering, horizontal centering, blanking; bottom row—vertical size, horizontal frequency, horizontal size. The control at the extreme lower right is the video gain control.

The heater leads for the 6AG5 tubes should be run along the edge of the chassis to reduce the field around these leads. The 0.1-μf. coupling capacitors should be placed well away from the chassis as should the peaking coils. The Type 5527 tube is mounted in a shielded housing to protect it from stray fields.

The lens system is shown in Fig. 3. The lens used was a surplus one originally made for the sniperscope unit. It is a Bausch & Lomb f/2.1, focal length 3.5 inches. With this fast lens very good pictures can be obtained by using one or two No. 1 photoflood lamps to supply the necessary light.

A piece of 27/8-inch copper tubing 4 1/4 inches long is mounted to the front of the camera by

Top and bottom views of the sync, blanking, and video line amplifier chassis. The video line amplifier is along the left-hand edge of the chassis in the top view, and along the lower edge in the bottom view.
using spade lugs. The lens is fitted to slide in and out of the copper tubing for focusing. It is adjusted to the correct diameter for a light-tight fit by gluing felt around it. The inside and the outside of the copper tubing is painted a flat black to eliminate reflections.

Sync and Blanking Chassis

The synchronizing and blanking generator is built on a 13 x 17 x 3-inch chassis. An 8½ x 19-inch panel is used to mount the necessary controls for the camera unit. The circuit of the synchronizing and blanking generator is shown in Fig. 4. In the unit built by the writer standard-size tubes were used, but miniature types may be used if desired. The photographs show several views of this unit.

The vertical synchronizing and sweep pulses are generated by a Type 6AC7 tube. The grid of this tube is coupled to the 6.3-volt heater voltage, thus locking the vertical synchronizing and sweep voltage directly to the power-line frequency. A Type 6SN7 tube is used as an amplifier to provide sufficient sweep voltage for the iconoscope tube. The 0.5-megohm control located in the grid of the second section of the 6SN7 should be adjusted for equal output voltages to the deflection plates of the 5527 iconoscope.

The horizontal synchronizing and sweep pulses are generated by a free-running multivibrator using a Type 6SC7 tube. The horizontal frequency can be set by a front-panel control. The 6J5 is used as a horizontal discharge tube, and the horizontal sawtooth is amplified by a 6SN7 to an amplitude sufficient to sweep the 5527 tube.

The straight-sided pulse that is developed in

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**Fig. 6 — Regulated plate supply for sync and blanking tubes and video amplifiers. T1 — 525 v. each side c.t., 300 ma.; 5 v. at 6 amp; 6.3 v. at 6 amp. CR — Selenium rectifier, 65 ma.**

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**Fig. 7 — High-voltage supply for iconoscope. La — Thordarson T20C50. T1 — Neon-sign transformer (see text). Thordarson T22R40 or equivalent may be used, but it may be necessary to change the values of R1 and R2. R1 should be of proper value to permit varying the output voltage from 700 to 900 volts. T2 — Filament transformer, 6.3 volts, 1 amp.**

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**Fig. 8 — Centering-voltage power supply diagram. T1 and T2 are replacement-type power transformers rated at 600 volts, center-tapped, at 40 ma. With different transformers, Vf should be chosen to give the transformer secondary voltages indicated. CR — Selenium rectifier, 65 ma.**
This power supply chassis contains the three supplies shown in Figs. 6, 7 and 8. Right—bottom view of the power supply chassis.

the cathode circuit of the 6AC7 vertical oscillator and the straight-sided pulse that is developed in the plate circuit of the 68C7 horizontal oscillator are fed into a 6SL7, which mixes and clips them to develop square waves that are used for blanking. These blanking signals are amplified in one half of another 6SL7 where pulses of proper polarity to blank the 5527 iconoscope are taken from the plate. A like pulse but of opposite polarity is taken from the cathode of the same tube and used for blanking the video line amplifier. (A monitor television receiver also can be locked in on these pulses.)

The video line amplifier, the circuit of which is given in Fig. 5, is built along the right edge of the chassis. As in the construction of the camera preamplifier, all leads should be kept as short as possible and the coupling capacitors should be dressed away from the chassis to prevent any loss of high frequencies. The blanking pulses are fed into the plate circuit of the second video amplifier stage. The 1000-ohm resistor in series with the blanking lead is used to prevent loss of video signal.

The filament transformer for the tubes in the synchronizing, blanking video line amplifier, as well as for the camera preamplifier stages, is located on this chassis.

**Power Supplies**

The power supplies for the operation of the camera unit are built on a 13 × 17 × 3-inch chassis. For the operation of the camera preamplifiers, video line amplifier, and necessary synchronizing and blanking stages, a 325-volt regulated supply is used. A 150-volt negative supply is used for the video high-peak stage. Two 75-volt supplies are used to furnish centering voltages for the iconoscope tube. An 800-volt supply is also included on this chassis to provide the necessary negative high voltage for the iconoscope tube.

The 325-volt regulated supply uses two 5U4Gs for rectifiers, two Type 6AS7 tubes as series regulator tubes, a 6SJ7 as control tube, and a VR-150 as reference tube. The 150-volt negative supply uses two selenium rectifiers in series to supply the necessary voltage. This voltage is regulated by a VR-150. The two 75-volt centering supplies each use two selenium rectifiers in a full-wave circuit, with the output voltages regulated by VR-75e.

In the author's unit a neon sign transformer was used to supply the negative 800 volts necessary for the operation of the iconoscope tube, the voltage being rectified by a 1B3G. The use of this 60-cycle supply requires rather elaborate filtering. A radio-frequency type power supply would require a lot less filtering, and since the total drain is very small this type of supply should work very satisfactorily.

**Acknowledgment**

I would like to thank Mr. R. R. Barrett and Mr. M. M. Goodman, Tube Department, Radio Corporation of America, and the McGraw-Hill Publishing Company, Inc., for permission to use some of the circuits from the article. "Simplified Television for Industry," that appeared in *Electronics*, June, 1947. Thanks also are due to Ken Neidig, W3MXT, who took all photographs [including cover shot — Ed.] of the equipment.

**OUR COVER**

John Keller, author of the TV camera article presented in these pages, puts his equipment through its paces in the W3NDB shack. Other cameras, built by W4ATO and W4HER, are shown on page 83.
Tube-Keyed Grid-Block Keying

BY A. R. WILLIAMS, VE3BSH

Tube keysers are usually used in the cathode circuit of a keyed stage, but the principle can be applied to grid-block keying of a low-level stage with little or no difficulty. The keyer to be described has been in use at VE3BSH for over a year, and it has been so satisfactory that it is certain to be included in any future transmitter installations.

As can be seen from the diagram in Fig. 1, it consists of a 6SJ7 keyer tube and a low-powered negative-voltage supply. The power supply can be anything that will furnish about 5 ma. at about 250 volts; using material around the shack I found an old audio output transformer, $T_1$, and current is a maximum of $\frac{1}{2}$ ma., and the sparking at the key is imperceptible.

In the transmitter at VE3BSH, two 6F6 isolation stages following a 6AK6 Clapp oscillator are keyed with this arrangement, and the keying is very clean and pleasing to listen to. A resistor is used at $R_1$ instead of the r.f. choke used there originally, to eliminate a tendency toward a parasitic oscillation, but this had nothing to do with the keying system, of course.

If one has an oscillator that is stable enough to key without chrip, it may be keyed by this circuit by lifting the "cold" end of its grid resistor and connecting it to the junction of $C_3$, $R_3$ and $R_4$. Several stages can be keyed simultaneously by returning their grid resistors or r.f. chokes to this same point. In any event, it should be used with stages running little or no grid current, because any flow of current will develop additional grid bias across $R_4$.

Fig. 1 — Circuit diagram of the grid-block tube keyer.

- $C_1$ = 100 µfd.
- $C_2$ = 0.02 µfd.
- $C_3$ = Normal cathode condenser, if used.
- $C_4$, $C_5$ = 2 µfd. 350-volt electrolytics.
- $C_6$ = 0.001 µfd. mica.
- $C_7$ = 0.1-µfd. paper.
- $R_1$ = 4700 ohms, or 2.5-mh. r.f. choke.
- $R_2$ = Normal cathode resistor, if used.
- $R_3$ = 0.1 megohm.
- $R_4$, $R_5$ = 47,000 ohms.
- $R_6$ = 470 ohms.
- $R_7$ = 15,000 ohms.

All resistors $\frac{1}{2}$ watt.

- $L_1$ = Small filter choke.
- RFC = 2.5-mh. r.f. choke.
- $T_1$ = Small audio output transformer.

✅

a 6X5 half-wave-connected rectifier to be satisfactory. The 6.5 volts for the voice-coil winding can be borrowed from the transmitter heater circuit, of course.

When the key is "up," the 6SJ7 grid is at cathode potential, the 6SJ7 conducts, and the negative voltage from the small supply is connected to the grid of the keyed stage. When the key is closed, -30 volts is applied to the grid of the 6SJ7, cutting it off and disconnecting the small negative supply from the keyed stage. The "make" characteristic is controlled by the value of $C_2$ and $R_4$, and to a lesser degree by $R_3$, $C_4$ and $C_7$ in the 6SJ7 grid circuit. Making any of these values larger will "soften" the keying on make — $C_2$ is probably the best one to operate on to get a desired characteristic. On "break" the keying can be softened most readily by increasing the size of $C_7$.

$C_7$, $R_3$, $R_4$ and RFC also constitute an r.f. filter for eliminating any local b.c.-receiver click caused by minute sparking at the key, but no trouble has been encountered along these lines. The key

* Sioux Lookout, Ont.

Quest Quiz

The new 20-meter beam that A built will require a 200-foot feed line into the shack. Finding that the loss in 200 feet of RG-8/U coaxial cable would be 1.25 db. for the matched condition, A has been considering the use of an open-wire line. His friend B advises him against it, saying that although the theoretical loss in 200 feet of open-wire line would be only 0.15 db., the actual loss through radiation from the line would equal or exceed the loss in the coaxial line. Which feed line is better, and why?

(Please turn to page 64 for the answer)
Compact R. F. Assembly for 50- and 144-Mc. Mobile

Using the Multicircuit Tuner at V.H.F.

BY C. VERNON CHAMBERS,* WIJEQ

While the objectives in the design of mobile equipment for v.h.f. are, of course, the same as in low-frequency gear, some of them are not so readily attained in units operating at 6 and 2 meters. Many of the liberties taken in achieving compactness and simplicity at the lower frequencies would be fatal to the performance of a rig operating at v.h.f. Nevertheless, with proper attention to the essential factors, it has been possible to arrive at a simple unit of small dimensions that requires no compromise in efficiency, while maintaining operating conveniences usually found only in lower-frequency gear. The transmitter described is ideally suited for under-the-dash mounting — it is only 3 inches high — or it may be lashed to the fire or side walls of the cab.

Aside from a very desirable form factor, the transmitter has several other features which should interest the mobile fan. One of these is the ease with which the rig can be hopped back and forth between bands. For instance, to get from 50 to 144 Mc., only change the crystal, flip the s.p.d.t. output-coupling switch — the only r.f. switch in the layout — and retune three stages. Plug-in coils and complicated r.f. switching circuits have been eliminated completely by utilizing wide-range tanks in the exciter stages and by employing a multicircuit tuner in the plate side of the amplifier. Incidentally, this tuner not only shows efficiency comparable with the more commonly used series-tuned circuit at 144 Mc., but also features construction that is rather novel. A single length of B & W Miniductor, with minor modification, provides a rugged one-piece assembly containing the amplifier-plate and the output-coupling inductances for both bands of operation.

A wide range of crystal frequencies — 8 through 25 Mc. — may be used with the transmitter. In addition, the entire rig may be operated from a 300-volt supply capable of delivering 100 ma. This means that a standard 200-volt 200-ma. supply could be used to power the r.f.

*Technical Assistant, QST.

In this view the perforated top cover has been removed to show the complete transmitter. The input and output connectors are on the rear chassis wall and the 5763 subassembly is inside directly to the left of the meter switch. The Z-shaped partition supports C12, RFC4, and the 2E26. Notice that C12 is mounted on an insulated feed-through bushing. The oscillator tuning capacitor, C5, is panel-mounted directly below C9. The output switch, S1, is partially hidden by the Z-shaped plate. The multicircuit tuner is at the upper end of the chassis, just below the link tuning condenser, C13.

November 1953
Fig. 1 — Circuit diagram of the v.h.f. mobile transmitter.

(NOTE: All resistance values in ohms, K = 1000. Resistors ½-watt, unless otherwise noted.)

C1 — 100-µuf. variable (Hammarlund HF-100).
C1a — 50-µuf. variable (Hammarlund HF-50).
C1b — 15-µuf. per-section variable (Hammarlund HFD-15-X).
L1 — 1.9 µh, 34 turns No. 22 enameled, ½-inch diam.,
close-wound.
L2 — 0.44 µh, 6 turns No. 20 tinned, ½-inch diam.,
2½ inch long (B & W 3003).

Section as well as an external modulator. However, provision is made for the application of higher voltage (above 300) to the amplifier from a separate supply if this proves desirable. The transmitter also includes a meter-switching circuit that provides for the metering of an external modulator.

Although the transmitter is referred to as a 2-band mobile rig, it may be used as the exciter for a 50- or 144-Mc. amplifier, or as a source of 48-Mc. excitation for a v.h.f. tripler.

Circuits

As shown by Fig. 1, the Tri-tet oscillator employs a Type 5763 tube, as does the multiplier or driver stage of the transmitter. The oscillator has a fixed-tuned cathode circuit that is resonant at approximately 15 Mc., a frequency that was determined experimentally as being optimum for the range of crystal frequencies usable with the transmitter. Cathode bias developed across R2 holds the input to the tube to a safe value in the event of excitation failure. The plate tank for the oscillator uses C5 to resonate L2 at 21 through 36 Mc.

This plate tank is tuned to 25 Mc. for 50-Mc. output of the transmitter, and may be tuned to either 24 or 36 Mc. for amplifier output at 144 Mc. Capacity coupling is used between the oscillator and the driver stages.

The multiplier is straightforward, employs protective cathode bias and is capacity-coupled to the amplifier grid circuit, C5C6. The multiplier operates as a doubler to 50 Mc. when the transmitter is set up for that frequency of operation, and as either a doubler or tripler (depending upon the tuning of the oscillator) to 72 Mc. when the rig is fired up for 144-Mc. work.

The Type 2E26 in the final operates straight through at 50 Mc. and as a doubler for output at 144 Mc. A combination of fixed and grid-leak bias is used. The value of fixed bias is not especially critical (either 22.5 or 45 volts) and is recommended mainly as a protective measure against damage to the amplifier tube in the event of excitation failure. Screen voltage is taken from the plate supply through R11. A value of 22K for R11 gives the proper voltage drop for the screen over a supply-output range of 300 to 400 volts.

The plate tuner for the amplifier consists of capacitor C17 and inductors L4 and L6. Output from the amplifier is transferred to J1 by a series-tuned circuit consisting of C18, L6 and S1. As seen in Fig. 1, L6 is electrically subdivided by a tap which connects to C18. The portion of L6 above the tap provides output coupling at 50 Mc. and the lower section of the coil couples to L6 when S1 is set for 144-Mc. operation.

The metering circuit uses S8, a 200-ma. d.c. milliammeter, and resistors R4, R5, R10, R12 and R13. R12 is connected to Terminals E and E1 of the switch and, in turn, to Pins 7 and 8 of the power-input connector, J2. This last set of con-
Connections allows the plate current of an external modulator to be checked by the meter.

Provision for connecting either a single or a pair of supplies to the transmitter are provided for at J2. If a single 300-volt pack is used for the entire r.f. section, it is necessary to connect a jumper between Pins 3 and 5 of J2. With separate supplies, connect the 300-volt job to Pin 3 and the amplifier supply to Pin 5. If a modulator is to be connected to the transmitter, connect the secondary of the modulation-transformer between Pins 5 and 7 of J2, connect B-plus for the r.f. amplifier to Pin 7 and then return the B-plus lead of the modulation-transformer primary to Pin 8.

Construction

An aluminum chassis, measuring 3 by 5 by 10 inches, is used as the housing for the transmitter. Most of the actual construction is made easy by the use of subassemblies, as indicated by the accompanying photographs.

A view of the oscillator-multiplier section along with Fig. 2 identifies the components for this assembly. The plate that supports the component has 3/4-inch lips at the right and the bottom edge for bolting to the chassis, and also has a narrow flange at the front (as seen from the inside view of the transmitter) to give additional mechanical strength. The tinned-wire lead which connects to C5 (at a later stage of the construction) should be about 3 inches long and the five leads which will be joined to J2 and S2 can be 5 inches long.

The interior view of the transmitter shows a Z-shaped partition fastened to the front, bottom and rear surfaces of the chassis. To simplify construction, this partition is actually fabricated from two pieces of aluminum. The rear section has 3/4-inch lips for fastening to the rear and bottom of the chassis, a 2 1/2 inch span to support the 2E26, a 1 3/4-inch member that runs parallel with the length of the chassis and still another lip that holds to the forward partition. The forward section is 2 1/2 inches wide and has 3/8-inch mounting lips front and bottom.

The socket for the 2E26 is mounted above deck to permit a short plate return. The socket should be mounted by means of bolts, nuts and 3/8-inch metal posts directly above a 1 3/4-inch hole that has been punched in the mounting plate. Probes 1, 2, 4, 6 and 8, and the screen by-pass capacitor, C9, should all be returned directly to ground on the socket side of the mounting plate. A 2-terminal tie-point strip to the rear of the socket is used to support the heater lead and the h.v. end of the screen resistor R11.

The bracket that fastens to the front wall of the chassis should be fitted with a feed-through bushing (we used a Millen type 32100) which will, in turn, support the amplifier grid-tuning capacitor, C12. Place the bushing at a point that will provide adequate clearance between C12 and the rear partition. C12 may now be bolted in place with the bushing hardware.

Next, mount the meter shunts across the terminals of S2. Now, join Contacts A1 and B1 (Fig. 1) together, and then connect 8-inch wire leaders to the rotor-arm contacts and to Contacts C1, D1, E, and F1. A leader about a foot or so long should be soldered to Contact D.

Construction of the multielectric tuner constitutes the last subassembly operation. The tuner will be a compact and rugged affair if instructions are followed. First, reduce a Type 3006 B & W Miniductor to a total of 14 1/2 turns. Now, without breaking the support bars, clip the winding at points which will leave 5 full turns at one end and 3 1/2 turns at the opposite end. The 6 turns that are left intact between end windings are used as the output coupling inductance. Short tinned leads (2-inch lengths of No. 16 will do) should now be soldered to the free ends of the three windings.

Also, solder a short lead at 1 1/4 turns from the 144-Mc. end (the end closest to the small outside coil) of the output inductor. This should place the tap at the top of the coil, as shown in the inside view of the transmitter.

To assemble the tuner, turn C17 with the insulated support bar facing toward the left, as viewed from the shaft end of the condenser. Now, place the 3-section inductor about 3/8 inch...
above and parallel to the condenser, and then bend the four leads from \( L_4 \) and \( L_5 \) into place. Make certain that the outside ends of the two plate coils go directly to the stator terminal at the rear of \( C_{17} \) and that the inside lead of \( L_5 \) (the one next to the coupling link) goes to the stator terminal at the front. The cold end of \( L_4 \) (the one next to the output link) may be returned to a soldering lug at the rear of the condenser. The lug can be held in place by one of the machine screws that pass through the isolantite base plate to the rotor frame of the capacitor.

It is now time to start mounting parts on the main chassis. Center \( J_2 \) on the rear wall at a point located \( 4\frac{1}{4} \) inches in from the right end (rear view) of the chassis and mount \( J_1 \) at the lower left-hand corner. Holes for the panel-mounted parts should now be marked and drilled. The shafts for \( C_{17} \) and \( C_{18} \) are each located 1 inch in from the right end of the unit. \( S_1 \) is centered \( 1\frac{3}{4} \) inches to the left of \( C_{17} \), and the oscillator capacitor, \( C_5 \), is still another \( 1\frac{3}{4} \) inches to left of \( S_1 \). A panel-bearing assembly for \( C_{12} \) must be set in the front wall just above \( C_5 \). Spacing between the meter switch, \( S_2 \), and the tuning capacitors is also \( 1\frac{3}{4} \) inches. The meter mounts at the extreme left end of the panel.

The subassemblies may now be positioned in the chassis while mounting holes are marked. As seen from the inside view of the transmitter, the section for the 5763s is located \( 3\frac{3}{4} \) inches in from the bottom of the chassis. The Z-shaped plate which crosses the chassis has the lower section (the one that supports the 2E26) fastened to the rear wall at a point \( 5\frac{1}{4} \) inches in from the bottom of the unit.

After the necessary holes have been marked and drilled, set the subchassis aside and proceed with the wiring. Connect \( S_1 \) to the tuner and to \( J_1 \); solder the tap on \( L_6 \) to \( C_{16} \); mount \( L_5 \) on the terminals of \( C_5 \); connect the rotor arms of \( S_2 \) to the meter.

Now, mount the exciter assembly and, using the leads already provided, wire it to \( C_5 \), \( J_2 \) and \( S_2 \). Mount a 1-terminal tie point at the right end (front view) of the crystal socket and mount \( R_9 \) between the terminal and Contact C of \( S_2 \). Run leads to the crystal socket, and then mount the partition carrying \( C_{12} \), \( RFC_4 \) and the 2E26. Be sure to use an insulated shaft coupling between \( C_{12} \) and the panel bearing. The remaining wiring can now be finished off in a few minutes.

### Testing

A conventional a.c. power supply that will deliver 6.3 volts at 2.3 amp. and 300 volts at 100 ma. may be used during testing of the transmitter. Do not connect the output of the supply to the amplifier input terminals (Pin 5 of \( J_2 \)) at this time. Bias for the amplifier may be obtained from a small B battery. A 10-watt lamp bulb, that will be used as a dummy load, should be plugged into \( J_1 \) and a crystal must be placed in the crystal socket. For 50-Mc. operation, the

(Continued on page 114)

This subassembly measures \( 2\frac{1}{4} \) by \( 3\frac{1}{4} \) inches and supports most of the components for the exciter stages. \( C_{16} \), with one end floating free, is at the upper right-hand corner. The wire leaders at the bottom of the plate connect to the oscillator tank, meter switch and power connector, as shown by Fig. 2.
A Simple Heterodyne Exciter for 10 Meters

Stabilizing the VFO for Higher Frequencies

BY CHARLES FAULKNER, W6FPV

Previous articles in QST and elsewhere have pointed out the advantages of the heterodyne type of VFO. However, most of the units described have been designed for either 3.5- or 7-Mc. output, making it necessary to multiply frequency (and any drift or other instability along with it) to get to the higher-frequency bands. It is, however, possible to avoid this multiplication by heterodyning directly to the higher frequencies. (See Fig. 1.) While there may be certain complications in attempting multiband operation on this principle, the system can be quite simple if only one band, such as the 10-meter band, is involved. In doing this, the VFO can still operate at a frequency low enough to assure good stability. Since there is no frequency multiplication involved, the stability at 28 Mc., in terms of cycles, will be essentially the same as at the VFO's fundamental.

Choice of Frequencies

So far as arriving at the desired output frequency is concerned, the only requirement is that either the sum of the two oscillator frequencies, or their difference, equal the desired output frequency. However, there are other considerations.

In the process of mixing, spurious frequencies are unavoidably generated and it is desirable to select oscillator frequencies that will place these spurious frequencies as far removed from the desired output frequency as possible so that they may be more easily rejected by the tuned circuit in the output of the mixer.

Also, from the consideration of frequency drift (and chirp in c.w. operation) it is desirable to allow both oscillators to run continuously without causing interference in the receiver. This can be done, provided the oscillator fundamentals and their harmonics fall outside the band of operation, since the desired output frequency appears only when the mixer stage is operating.

The mixer can be keyed for break-in c.w., or switched on and off for push-to-talk 'phone.

Using the BC-459

Although other combinations might have been considered, I had a surplus BC-459 covering 7000 to 9100 kc., and a crystal I had been using for 6 meters. A little figuring showed that these could be used to produce output in the 10-meter band. The crystal is a 3rd-overtone unit marked 12,535 kc., whose fundamental is about 4178.3 kc. By using the 9th overtone at about 37,600 kc., and the difference frequency, it is possible to cover the output range of 28.5 to 29.7 Mc., while tuning the BC-459 from 9.1 to 7.9 Mc.

By adjusting the slug and padding, or perhaps pruning the oscillator coil, in the BC-459, so that the VFO tunes up to 9600 kc., the entire band down to 28,000 kc. could be covered. However, as the output frequency goes from 28,000 to 28,267 kc., the third harmonic of the VFO will go from 28,800 to 28,000 kc., putting a signal in the band over this range. Some may not consider this to be too serious, since only at 28,200 kc. will this harmonic fall directly on the operating frequency. However, if the harmonic is pronounced, the selectivity of the following circuits may not be sufficient to keep it from reaching the antenna.

If this is to be avoided, the most convenient combination, assuming that the BC-459 is to be used, would be to retune the VFO slightly so that it goes to 9200 kc., and use a crystal-oscillator frequency of 37,200 kc. (The crystal would be an overtone type nominally close to 12,400 kc.)

This BC-459 has been revamped to provide a heterodyne-type exciter for the 10-meter band. The upper portion of the panel is new. Original holes in the lower portion are used for the key jack, VFO-set switch and a panel lamp. The grid-current jack, buffer tuning slug, C3 and C5 adjustment holes, are along the side.

* 8804 Cedros, Van Nuys, Calif.
Fig. 2 — Circuit of the 10-meter heterodyne exciter.

C₁ — 15-mfd. variable.
C₂, C₅, C₆, C₇, C₈, C₁₆, C₁₈, C₁₉, C₂₀, C₂₂, C₂₃, C₂₄, C₂₅ — 0.001-mfd. disk ceramic.
C₃, C₄, C₉, C₁₀, C₁₁, C₁₂, C₁₃, C₁₄ — 30-mfd. mica trimmer.
C₁₅, C₁₇ — 0.01-mfd. mica.
C₁₆ — 47-mfd. mica.
C₁₈, C₁₉ — 0.0047-mfd. mica.
C₂₀, C₂₁ — 0.002-mfd. 1200-volt mica.
C₂₂ — 50-mfd. 1000-volt variable.
C₂₃ — 100-mfd. 1200-volt mica.
C₂₄, C₂₅, C₂₆, C₂₇, C₂₈ — As originally in BC-459.
R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, R₉, R₁₀ — 22,000 ohms, 3½ watt.
R₉, R₁₀ — 22,000 ohms, 1 watt.
R₁₁, R₁₂, R₁₃ — 47 ohms, 3½ watt.
R₁₄ — 330 ohms, 1 watt.
R₁₅ — 15,000 ohms, 3½ watt.
R₁₆ — 10-watt resistor, resistance value depends on supply voltage — adjust for 250 volts at screen with amplifier loaded.
R₁₇ — As originally in BC-459.
L₁ — 13 turns No. 20 enam. ⅛-inch diam., 1 inch long.
L₄ — 7 turns No. 20 enam., ⅛-inch diam., ¾ inch long.
L₅ — 4 turns No. 22 bare, ⅛-inch diam., 1 inch long.
L₆ — 8 turns No. 22 enam. on ⅛-inch slug-tuned form (e.g., Millen 60046).
L₇ — 10 turns No. 24 enam., ⅛-inch diam., ¾ inch long.
L₈ — 6 turns No. 14 enam., 1-inch diam., ¾ inch long.
L₉, L₁₀ — As originally in BC-459.
L₁₁, L₁₂, L₁₃ — As originally in BC-459.
L₁₄, L₁₅ — Closed-circuit 'phone jack.
J₁, J₂ — Coax connector.
MA₁ — 200-ma, d.c. milliammeter.
RFC₁, RFC₂ — 2.5-mh. r.f. choke.
S₁ — S.p.s.t. toggle.
With this combination, no VFO harmonic will fall inside the band. The second harmonic of the crystal oscillator will fall in the gap between TV Channels 4 and 5, and its third harmonic between the high and low v.h.f. TV bands. The first VFO harmonic to fall in the TV bands is the seventh. Harmonics of the 28-Mc. output frequency must be treated as usual with any other type of circuit, of course.

The Circuit

The circuit of the rig is shown in Fig. 2. The crystal-oscillator is of the regenerative type, operating at the 9th overtone of the crystal, as discussed previously. A 9002 was used in this instance, but almost any of the small triodes should work equally well. Don’t let this circuit scare you, since it is not difficult to get output on overtones much higher than the ninth. A little care is necessary in finding the best position for the tap on L1 but, once set, no further adjustment should be necessary.

As stated earlier, the VFO is the original in the BC-459 although, of course, any good stable VFO covering the required frequency range could be substituted. The two oscillators are fed into a 12SA7 mixer whose output is tuned to the 28-Mc. band. A slug-tuned coil is used in the output circuit of the 6AG7 buffer stage.

If you have been bothered with TVI and have not yet tried the pi-network output circuit, let me recommend it to you. This exciter was first built with a conventional plate tank for the 1625 final. Although there was no TVI without the antenna, Channel 2 was taken out completely as soon as the antenna was connected. After reading the article on pi networks in QST, this circuit was tried out. Then, with the antenna connected, only a slight herringbone pattern was visible in Channel 2 and this could be eliminated with a low-pass filter. The output condenser, C16,

\[ C_{16} \]

should be resonated with \( L_{7} \) to the local band where TVI is worst. The circuit is designed to work into coax to an antenna tuner, and thence into any type of antenna or feed system. \( R_{9}, R_{7}, R_{3} \) and \( R_{18} \) are necessary to suppress v.h.f. parasitic oscillations.

All stages, except the two oscillators, are keyed simultaneously in the common cathode lead.

Construction

The BC-459 chassis is stripped of everything but the oscillator tube and associated circuits. The original amplifier tuning condenser is left in so as not to disrupt the tuning cable, but otherwise is not used. One of the 1625 sockets is removed and the hole covered with a piece of aluminum. The aluminum is then punched for the 6AG7 socket. The socket for the calibrating crystal at the center of the rear of the chassis is similarly replaced with a socket for the 9002 (or other crystal-oscillator tube). The socket formerly used for the “magic eye” is used for the 12SA7.

The components associated with the two oscillator tubes and the mixer tubes are mounted underneath at the rear of the chassis, close to the tube sockets. \( C_{7}, C_{8} \) and \( C_{8} \) are mounted so that they may be adjusted through holes in the sides of the chassis. \( L_{6} \) is mounted near the 6AG7 socket so that the slug can be adjusted from the side. The output-circuit tuning condenser, \( C_{15} \), and the coil, \( L_{6} \), are mounted on top of the chassis, as shown in the top-view photograph.

Top view of the 28-Mc. heterodyne exciter. At the left, from bottom to top, are the 1629, the 9002 and the 12SA7. To the right of the original oscillator unit are the 6AG7 buffer and the 1625 final with its pi-section output circuit. The crystal socket has since been moved inside to eliminate the last traces of key-up signal.
An aluminum patch was cut to cover the top of the panel, and the meter, output-stage tuning control, and coax connector were mounted on it. Existing holes in the lower portion of the panel were used for the key jack, the switch $S_1$, and a pilot lamp. The amplifier grid-current jack, $J_2$, was mounted on the side of the chassis.

**Adjustment**

Fig. 3 shows the circuit of a suitable power supply. Oscillation in the crystal circuit can be determined by connecting a low-range milliammeter in series with the 105-volt terminal and watching for the dip in plate current as $C_1$ is tuned through its range. The 1620 should be removed temporarily. If you do not have a calibrated wavemeter or g.d.o. covering 37 Mc., it should be possible to check to make sure that you are on the correct overtone by listening with the receiver. Place a wire close to the crystal oscillator and run it to the antenna terminal of the receiver. Add your receiver i.f. to the crystal-oscillator frequency, divide by 2, and subtract the i.f. You should hear the crystal-oscillator signal close to this calculated frequency, making use of the 2nd harmonic of the receiver’s high-frequency oscillator. As an example, if your crystal-oscillator frequency is 37,200 kc., and your i.f. 465 kc., then

\[
37,200 + 465 = 37,665
\]

\[
37,665/2 = 18,832.5
\]

\[
18,832.5 - 465 = 18,367.5 \text{ kc.}
\]

When you have located the signal on the receiver, wave your hand around $L_1$ to make sure that the crystal is controlling. If it is not, the frequency will change with the motions of your hand. The tap on $L_1$ should be set as far toward the grid end of the coil as possible, still maintaining oscillation. If you cannot find the signal at the right frequency, see if you can find another dip in plate current by resetting $C_1$.

After the 1626 has been replaced and the range of the VFO checked, it should be possible to hear the resultant signal in the 10-meter band. Then $C_4$ and $C_5$ can be adjusted for maximum deflection on the receiver S-meter. The slug of $L_4$ is

(Continued on page 110)

Bottom view of the 10-meter heterodyne exciter. The amplifier tuning condenser at the right is not used in the circuit. $C_6$ is in the upper left-hand corner, adjustable from the rear. $L_2$ and $L_3$ are in the lower left-hand corner, with the trimmers $C_5$ and $C_6$ adjustable from the lower side.
The Single Side-Saddle Linear
A 75-Meter 807 Linear Amplifier for S.S.B.

BY CARL W. ECKHARDT,* W7BBK

Here is a low-power Class B linear for one of the new, popular, simplified s.s.b. exciters designed by Rust,1 Edmonds,2 and Norgaard.3 There have been several excellent linear designs in the medium- and high-power class, such as the Lazy Linear,4 and Two-Stage Linear Amplifier,5 and the Power-Peaker.6 The Side-Saddle Linear is designed for the low-power station and will operate from existing 50-watt 600-volt power supplies. The 807, in the Side-Saddle Linear, performs efficiently as a Class B linear and will deliver approximately 50 watts of peak s.s.b. output at 75 watts peak input. Fifty watts of s.s.b. output should be properly evaluated, considering that s.s.b. gives an effective gain of at least 9 db. over a.m., equivalent to increasing the transmitter power 8 times.7 Furthermore, the 807 is literally loading at 600 volts plate voltage.8

Every effort was made to “de-bug” the amplifier before construction by referring to the excellent articles on linear design by Reque9 and Long,10 and using straightforward mechanical and electrical layout. The resulting amplifier is stable and behaves properly, just as the experts say it should.

The receiver has been connected directly to the antenna coax transmission line through an electronic “TR” switch,11 and although the 807 is not biased to cut-off during receive periods (the exciter is), the linear is perfectly quiet, with no trace of thermal noise.12

The drive requirement is approximately 2 watts. As Fig. 1 shows, the grid is series-fed, and 35 volts of bias is supplied by batteries. Since approximately 1 ma. of grid current will flow on peaks, batteries provide the cheapest and most

*Ritzville, Wash.
1 Rust, "Single Sideband for the Average Ham," QST, August, 1949.
7 ARRL Handbook.
12 This may not hold true in all cases where the final runs idling current and an electronic TR switch is used. --- Ed.
convenient method of supplying the required well-regulated bias voltage.

The plate is shunt-fed, and 300 volts regulated is provided for the screen. Instability cannot be tolerated in a linear amplifier. To insure a stable-operating 807, the physical layout of the Torpedo Twins was used. The grid and plate circuits are effectively isolated above the chassis as illustrated, and by a 3-inch aluminum shield running the depth of the sub-chassis, near its center, thereby isolating $C_4$ from $C_5$. Further to guard against instability, small 1-watt noninductive resistors $R_4$ and $R_5$ are placed in the grid and screen leads directly at the socket. The cathode is grounded to the tube-support chassis with a short lead at the socket. The screen by-pass condenser $C_9$, a disk ceramic, is wired directly across the tube socket, keeping leads as short as possible. Noninductive resistor $R_3$ provides the proper amount of swamping.

The values given for the grid and plate tank circuits should be followed if proper circuit $Q$ is to be maintained. The Bud coils specified must be pruned to get the desired $L/C$ ratio. Three turns are carefully removed from both $L_1$ and $L_2$. The end link of $L_2$ did not provide sufficient coupling and was cut from its supporting leads at the coil. One of the remaining link support leads is used as the antenna tap to $L_3$. Scrape a small section of the enamel covering from the 3rd, 4th, 5th, and 6th turns from the ground end of $L_3$ and carefully solder the antenna tap to the proper turn during the tune-up procedure.

The amplifier is constructed on an $8 \times 12 \times$ 3-inch aluminum chassis. A $4 \times 6 \times 2$-inch aluminum chassis provides the tube support as shown. The 807 is provided with a base shield. Grid and plate tank circuits are near the left- and right-hand ends of the chassis as illustrated. You will note that $J_1$ and the rotor of $C_1$ are at $-35$ volts bias potential and must be insulated from the chassis. This is done by slightly enlarging the mounting holes for $C_1$ and $J_1$, and insulating each of the bushings with a couple of fiber washers. The terminal strip and input and output...
coaxial sockets are on the rear of the chassis. An aluminum subchassis shield 7½ inches long by 2½ inches high, with a ½-inch lip, should be placed as mentioned earlier.

A pilot light, a power switch, and J2 are mounted on the front center of the chassis as shown. (The potentiometer below the chassis is not being used and should be ignored.)

The power supply shown in the schematic of Fig. 2 delivers approximately 600 volts at 150 ma. to the plate of the 807, and 300 volts regulated to the screen.

**Tune-Up Procedure**

Before applying power to the 807, check the bias and screen voltages. Without excitation to the linear, and applying power, the grid current should be 0 and plate current 10—15 ma. The amplifier should be perfectly stable without a trace of self-oscillation or parasites.

In applying grid drive and antenna loading, adjust for the following goals:

<table>
<thead>
<tr>
<th>Grid Current</th>
<th>Plate Current</th>
<th>Relative Ant. R.P. Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idling (no voice)</td>
<td>0</td>
<td>10-15</td>
</tr>
<tr>
<td>Maximum peak, tone or whistle</td>
<td>1 ma. max.</td>
<td>140</td>
</tr>
<tr>
<td>Normal speech peaks</td>
<td>100</td>
<td>high</td>
</tr>
<tr>
<td>Normal voice</td>
<td>10-15</td>
<td>60-70</td>
</tr>
</tbody>
</table>

Relative readings are suggested for output r.f.

current, as this will depend on the impedance of the line and the s.w.r.

Tap up from the ground end of L3 with the antenna tap until the above maximum peaks are reached. Provide just enough excitation to the linear by adjustment of L2 and gain control of the exciter so that the above maximum peaks are achieved. If additional gain or coupling of L2 will not give the peak readings desired, additional coupling to the antenna will be required. If you are overdriving, reduce the drive to the point where the peak conditions of plate current just begin to drop off.

Of course, in time you will wish to give your linear the acid test, the two-tone adjustment as described by Ehrlich, “How To Test and Align Your Linear Amplifier,” May, 1952, QST.

**TR Switch**

The TR switch in use is shown in Fig. 3, and in a modification of Cronin’s system. It shows about 1 S-point loss on 75 meters over a direct connection, and it protects the receiver to the point where a maximum of 4 volts reaches the receiver input terminals.

In use, the linear amplifier is mounted in a wooden rack above the Edmunds crystal-filter exciter. The meters measure antenna current, grid current and plate current.
Novice 80- and 40-Meter One-Tube Rig

Simple Construction for the Beginner

BY LEWIS G. MCCOY, WI1CP

When designing a Novice’s first rig, cost, simplicity, and TVI precautions most often are the prime considerations. The transmitter described in this article tries to fulfill these requisites. It is low in cost — approximately $14.00 for the parts at amateur prices. It is simple in design, utilizing a minimum of components. And the use of an aluminum chassis helps keep harmful TVI harmonic radiation down considerably.

The transmitter is a 6AG7 crystal-controlled oscillator, running at approximately 10 watts input. The output circuit can be tuned to 80 or 40 meters. The output circuit is the type known as a “pi-section tank” and is explained in Chapter 6 of the ARRL Handbook. It is a type that furnishes a fairly easy method of feeding random lengths of wire for antennas. The author strung up 30 feet of wire indoors to use as an antenna to test the rig described here. The first CQ brought a reply from Maryland, over 200 miles from northern Connecticut. It is worth mentioning that the received report of the contact was RST 580, so don’t be afraid to try indoor antennas.

Construction

After you’ve purchased all the parts for the rig (or raided your amateur friend’s junk box), you are then ready to go to work. Before cutting holes in the chassis, beg, borrow or steal a February, 1952, copy of QST. On page 30 is an article entitled “How To Wire a Transmitter.”

The first transmitter the Novice builds should be as simple as possible so that the builder has only a minimum of problems. Here is a transmitter that goes far toward being the ultimate in simplicity of construction.

study of this article, and the one on the use of tools in the May, 1952, issue, will save the builder a world of headaches and serve to point the way to neat workmanship. In the “layout” (placement of parts) of the transmitter, the power-supply section is kept in a line at the back of the chassis. The r.f. components are mounted toward the front of the chassis. As can be seen in the photographs, there are three octal sockets — one for the 5Y3 rectifier, one for the 6AG7 oscillator, and a third which is used as a crystal socket and key jack. The use of an octal socket for crystal and key terminals saves the cost of a crystal holder and a key jack.

With the exception of the three sockets and the meter, all the mounting holes can be made with an ordinary hand drill. For the socket holes, one can purchase, or borrow, a socket punch. The meter hole can be started with the socket punch and then enlarged with a half-round or rattle file. When drilling the mounting holes for the variable condensers be sure the condensers are placed so that their shafts extend far enough out from the front of the chassis to accommodate the tuning knobs. Incidentally, you will note from the circuit diagram, Fig. 1, that the rotors of the

Top view of the transmitter. $f_A$ at the top right-hand side is shown in the 80-meter position. The shorting clip is clipped to the feed-through bushing. The lead to the key is a short piece of 300-ohm Twin-Lead which is terminated in a Millen 300-ohm plug. This type of plug is the correct size for octal socket Pins 2 and 3.
condensers are grounded to the chassis, so there is no need to worry about insulation. These condensers are of the broadcast-receiver replacement type, and can be purchased locally, or from one of the large mail-order houses. They are usually listed in the catalogs as single-gang midget r.f.
condensers and have a maximum capacitance of more than 300 μfd. So long as those you buy have more than 300-μfd. Maximum capacitance, you’ll be safe. They cost about one dollar each.

The power transformer is mounted in such a manner that the high-voltage leads and the 5-volt rectifier leads are brought out at a point close to the 5Y3 rectifier socket. A three-terminal tie point is mounted close to the transformer 115-volt leads to furnish terminals for the power switch and transformer leads. After the sockets, a.c. switch, meter, and feed-through bushings for holding L1 are all mounted in place, we are ready to wire the rig.

The soldering iron to be used should have a clean tip so we’ll be sure to transfer enough heat to the point being soldered. Also, we use rosin-core solder, not acid-core.

Wiring

Connect the two 115-volt transformer primary leads (black), each to one of the tie-points. Then also connect one of the power-cord wires to one of these tie-points, and one terminal of the power switch, S1, to the other. Connect the remaining side of S1, and the remaining power-cord wire to the third tie-point. Fasten one of the 6.3-volt transformer leads (green) to a solder lug under the tie-point mounting screw. The remaining 6.3-volt transformer wire (green) is connected to Pin 7 on the 6AG7 socket.

For the high-voltage wiring, the center-tap wire of the high-voltage secondary (red and yellow) is connected to ground, one of the high-voltage leads (red) is connected to Pin 4 of the 5Y3 socket, while the other red lead goes to Pin 6. One of the 5-volt rectifier-filament leads (yellow) is connected to Pin 8 of the 5Y3 socket, and the other yellow lead is run to Pin 2. Also connected to Pin 2 of the 5Y3 socket is a lead from the choke, L2, and the lead marked + from C8. The other side of C8, or the negative side, is grounded. The remaining lead of L2, the plus side of C9, and a lead from R3, are all run to a terminal on a tie point. The negative side of C9 and the other lead from R3 are grounded. This completes the power-supply wiring. We are now ready to wire the r.f. section.

Pins 1, 2 and 3 of the 6AG7 socket are connected together with a bare wire and the wire run to ground. Also, one side of C5 must be grounded, so it can be connected to one of these pins. The other side of C5 is run to Pin 5. A lead to RFC3 is also connected to Pin 5. One side of C1, one side of R1, and a lead to Pin 8 of the crystal socket are all soldered to Pin 4 of the 6AG7 socket. The other side of R1 is grounded, while the remaining side of C1 goes to Pin 5. Pins 4 and 6 of the crystal socket are also grounded. The remaining side of RFC1 is connected to Pin 2 of the crystal socket. Also connected to Pin 2 is one side of C8. The other side of C8 is grounded. Although we call it the crystal socket, Pin 2 is the cathode side of the key jack while Pin 4 is the ground side. In other words, your key is connected between Pins 2 and 4 of this socket.

The screen resistor, R2, is connected between the B+ (terminal of C9) terminal and Pin 6 of the 6AG7 socket. Also connected to Pin 6 is one side of C5. The other side of C5 is grounded. A lead is connected between the B+ terminal and the + side of the meter. The other terminal of the meter is connected to one side of RFC5. Also connected to this point on RFC5 is one side of C8, the other side of C8 being grounded. The remaining side of RFC5 is connected to Pin 8 of the 6AG7 socket and C7 is connected between this side of RFC5, and the stator section of C10 is also connected to the nearest of the two feed-through bushings holding L1. The stator of C11 is connected to the other feed-through bushing, and a lead is run from this bushing to the transmitter output terminal mounted on the rear
side of the chassis. This should complete all wiring below the chassis.

**Coil**

As shown in the parts list, \( L_1 \) is a Barker & Williamson stock No. 3016 coil with 13 turns removed from each end. For 40-meter operation, it is necessary to short out a large part of the coil. This is accomplished by use of a short clip lead. One end of the lead is connected, along with one end of \( L_1 \), to the output bushing (the one connected to \( C_{11} \)). The other end of \( L_1 \) is soldered to the input bushing. To operate on 40 meters it is necessary to attach the clip to the 30th turn of \( L_1 \), from the input side. In order not to short out the 29th and 31st turns, they should be bent toward the axis of the coil. This will not affect the operation of the coil and will provide the necessary clearance.

**Testing**

You should now be ready to test the transmitter. You’ll need an 80-meter crystal between 3700 and 3750 kc. for 80-meter operation. For 40-meter work, you need one between 3588 and 3598 kc. Incidentally, don’t make the mistake of leaving your 40-meter crystal in the rig when you tune up on 80. You’ll find that you will be getting out, but not in the 80-meter Novice band — you’ll be operating on the crystal frequency which, in this case, would be lower than 3700 kc.

Let’s assume you are tuning up on 80 meters. You insert the crystal in Pins 6 and 8 of the octal socket. Your key leads are inserted in Pins 2 and 4. Most keys have a built-in switch for opening or closing the key. In this case, we leave the switch open. We are going to need a dummy load to test the rig and a 115-volt, 10- or 15-watt light bulb will serve the purpose. To make it easy to connect the bulb to the output terminal of the rig we can solder a piece of wire to the center terminal in the base of the bulb, and one to the screw shell portion. One of the wires is then connected to the output terminal of the transmitter and the other to the chassis. The 115-volt a.c. switch is turned on and the tubes allowed a minute or so to warm up. After the rig has been on for a minute, you can then close the key. Tune your receiver to the crystal frequency and you should be able to hear the transmitter’s signal. The input condenser, \( C_{10} \), is slowly turned through its range. Two things should happen — the dummy load lamp should light and your meter should show a dip, or lower reading, at the point where the bulb lights. Also, the signal should be louder at this point. Now tune the output condenser, \( C_{11} \), across its range and the bulb should brighten at one point, and the signal get louder in the receiver. A look at your meter will show that you are getting a greater reading than you had with the setting of \( C_{10} \) by itself. You can experiment by switching back and forth between the two condensers, always tuning for maximum brilliance in the bulb.

If you cannot hear the signal in the receiver, or the bulb doesn’t light, carefully check over (Continued on page 110)
Color Television and the Amateur

TVI and ITV Potentialities in the New Color TV System

BY GEORGE GRAMMER,* WIDF

The addition of color to a television picture introduces new elements into the TVI situation. From somewhat limited experience so far, it does not appear that the technical problem of getting rid of TVI will be intrinsically more difficult, but it may not be possible to get by with the minimum measures that sufficed, in certain cases, with monochrome television.

At the present writing it appears a practical certainty that FCC will scrap its current standards for color TV and adopt instead the standards worked out by the National Television System Committee. The NTSC, with membership drawn from segments of radio engineering and industry, has been working intensively on standards for a "compatible" system ever since FCC, after the now-famous controversy over color systems some three years ago, decided to go along with the frame-sequential system. It was not a popular decision, since it meant that the millions of TV receivers in existence could not receive a color signal, even as a black-and-white picture, without considerable modification. The system on which the NTSC standards are based is a compatible one — meaning that any monochrome receiver will reproduce a color signal as an ordinary black-and-white picture without requiring any circuit or other changes.

This is simply a bit of background, of little direct interest to amateurs since it is an internal matter in another service. What is of interest is the effect of the choice of system and standards for color TV on our TVI problems, and on the associated question of ITV. It is possible that by the time this issue of QST is distributed there will be regularly-scheduled color transmission on the air, so color TVI is not just something to anticipate in the dim future. To understand what may be in store, it is necessary to know something about the system.

The Proposed Color TV System

Probably most amateurs are familiar with the essential features of the black-and-white or monochrome television system as it is used in this country. The total channel width assigned for the complete signal, including both picture and sound, is 6 megacycles. The picture signal is amplitude-modulated on one carrier (but with most of the lower sideband removed) and the picture modulation components extend out to about 4 Mc. in the upper sideband. The sound signal is transmitted by frequency modulating a second carrier, which is placed 4.5 Mc. higher in the channel than the picture carrier. The picture carrier is placed 1.25 Mc. above the low-frequency edge of the channel.

This same arrangement is retained in the proposed color system — it has to be, of course, for compatibility. In fact, the detail in a color transmission actually is sent in monochrome, so an ordinary monochrome receiver handles a color signal just as it does a straight monochrome signal, and hardly sees any difference between the two.

At least, the viewer doesn't see any particular difference, and this represents a rather remarkable technical achievement. Because in order to send a color picture it is necessary to send all the information about where and when dabs of which color should appear in the picture, and this additional information has to be sent in the same channel that already is used for plain black-and-white information. It not only has to be sent in a form that can be utilized by a color receiver, but which also will not interfere with the picture in either a color or monochrome receiver.

The technical details are complicated, but to put it briefly, it can be said that the transmission of color requires sending a minimum of three separate sets of information. In the system on

* Technical Editor, QST.

Taking notes during the preliminary color TVI tests at the David Sarnoff Research Center, Princeton, N. J. No ham could see this ideally flat expanse of field behind the Princeton laboratory without having visions of whole families of rhombics! (Photo by W2LV)

November 1953
which the NTSC standards are based, one such set is “brightness,” or the relative intensity of light without respect to color. This is the same as the ordinary monochrome signal that appears as amplitude modulation on the picture carrier in a black-and-white transmission. The other two sets of information give the receiver all it needs to know about the colors in the picture. Although it might be expected that two additional carriers would be needed to convey the necessary modulations, only one carrier is used — and it is actually not transmitted at all, being suppressed at the transmitter. Only the color sidebands are transmitted. One set of sidebands, the red signal, is confined to a bandwidth of approximately 600 kc. and is produced by amplitude modulation of the “color subcarrier.” The other set, the blue signal, is amplitude-modulated on a part of the color subcarrier that has been shifted in phase by 90 degrees, and has a bandwidth of about 1.5 Mc. The composite signal from these two sets of sidebands is modulated in both amplitude and phase, the amplitude variations corresponding to color saturation, or the amount by which the color is diluted by white, and the phase variations to hue.

Since the carrier is not transmitted, it has to be supplied in the receiver for proper detection, just as receiving an amateur single-sideband signal requires a locally-supplied carrier. In this case, however, the locally-supplied carrier has to be exactly right both in frequency and phase, since double sidebands are transmitted. To keep the receiver local oscillator in line, a “burst” of the color subcarrier frequency is transmitted during the blanking period at the end of each line.

The requirement that the color information must not cause interference in the monochrome or brightness channel and thus be invisible in the picture puts definite restrictions on the frequen-

1 See The Radio Amateur’s Handbook, chapter on BCT and TVI; also TVI Tips, QST, June, 1949.

cies that can be used for the color subcarrier. First, it should be as far as possible from the regular picture carrier — in the upper reaches of the picture part of the channel where interference effects are relatively small. On the other hand, it cannot be put too close to the sound channel because of the possibilities of mutual interference there. Second, beat patterns are most noticeable when the frequency of the interfering signal is at or close to an integral multiple of the line frequency (giving vertical or nearly vertical bars) and tend to become invisible when the frequency is halfway between. Hence the subcarrier frequency must be an odd multiple of half the line frequency. The color sidebands will then tend to invisibility also, since these sidebands are discrete frequencies spaced at multiples of the line frequency away from the subcarrier (the sidebands in a regular monochrome signal are likewise discrete frequencies spaced at line-frequency intervals from the picture carrier).

For these and other reasons the carrier frequency has to be placed in a region roughly 3 to 4 Mc. above the regular picture carrier. The frequency eventually decided on, after detailed consideration of the four or five possible frequencies lying within this region, was approximately 3.58 Mc. (3579.545 kc.). The layout of a television channel for color transmission is therefore as shown in Fig. 1. The difference between Fig. 1 and the ordinary monochrome layout is in the addition of the color sidebands at the upper end of the channel.

In-Channel Interference

Now what does this new element mean in terms of TVI, particularly the type of interference caused by harmonics from an amateur transmitter? This part of the TV channel has been one in which a relatively strong interfering signal can be tolerated, as compared with interference from frequencies near the regular picture carrier.1 It has been possible to take advantage of it in, for instance, 28-Mc. phone operation by working on a frequency that throws either the Channel 2 or Channel 6 harmonic in the region 4 to 5 Mc. above the low edge of the channel. But that is just where all the color information lies, in a color transmission.

To date, opportunities to make a field check on this point have been nonexistent, but the question has been investigated on a laboratory basis.2 From past experience, there is every reason to believe that the laboratory results will be valid in actual practice. They show that in the frequency region where a beat pattern becomes less
A view inside the station wagon showing the equipment set up for operation. The transmitter was arranged for either VFO or crystal operation, with Variac control of the plate input. A considerable amount of accessory and test gear also was carried. A 100-foot length of heavy-duty power cable was used for connection to either 220- or 110-volt source of power.

bothersome with a monochrome signal, interference to the color circuits begins to increase. Near the color subcarrier frequency the interference caused by a signal of given intensity will be approximately the same as the interference caused by a signal of equal intensity near the picture carrier. In other words, the upper part of the channel will become just as "sensitive," for color, as the lower part now is, and the middle reaches of the channel will not be much better.

Thus it is to be expected that color TVI of the harmonic variety will not be appreciably alleviated by care in choosing an operating frequency. If you now get into trouble when you operate on a frequency that puts a harmonic near the picture carrier but can "get by" by staying on a higher frequency, you can look forward to having to do a bit better job of harmonic suppression before being in the clear with color. But if you are clean on all frequencies with black-and-white, you can expect to be equally free from trouble with color.

![Megacycles from low-frequency edge of channel](image)

**Fig. 1** — Frequency relationships in a color television channel. The sideband regions are only approximate; no attempt is made in this drawing to show the amplitude characteristics of the standard signal.

That is the situation with a color receiver receiving a color transmission. There are two other cases: a color receiver receiving a monochrome transmission, and a monochrome receiver receiving a color transmission. The first of these is no different from present TV so far as interference is concerned; no color sidebands are transmitted so the interference situation is the same as with a conventional receiver. In the second case, it is probable that the interference potentialities in the color-sideband region of the channel will be less than in color reception. Although an interfering harmonic can cause low-frequency beats with certain sidebands, and thereby put broad bars in the monochrome picture, the interference will be intermittent because the color information transmitted will be changing as the picture changes. Also, the intensity will depend on the characteristics of the receiver; many of them cut off fairly sharply in this frequency region.

Again it should be emphasized that by and large the problem is no more acute than it has always been; it is just the same old one spread over more of the TV channel. The same considerations also apply to the front-end deficiencies of TV receivers.

**Video Interference**

That 3.58-Mc. separation between the picture carrier and color subcarrier frequencies opens up new TVI possibilities in another direction. When the color signal is detected in the receiver, the locally-inserted carrier is actually on 3.58 Mc. and the color sidebands likewise have been converted down to lie in the 3- to 4-Mc. region. If there is an 80-meter transmitter nearby, it is distinctly possible that enough energy could be picked up directly on the receiver's color circuits, or fed through by stray coupling from the antenna, to cause interference.

Actually, such pick-up is nothing new. It occurs on many present-day monochrome receivers, but is seldom bothersome to the viewer because even the low edge of the 80-meter band is so far up in the video range that the beat pattern is extremely fine. In fact, close inspection of the picture is usually necessary in order to see it at all.

However, with the introduction of a subcarrier in the color circuits of the receiver at 3.58 Mc., together with its sidebands, an 80-meter signal no longer would be in the "invisible" region but in an excellent position to give all kinds of picture trouble, by causing low-frequency beats with the subcarrier and its sidebands. Television receivers, as a class, have not been distinguished for their ability to keep out near-by amateur signals.

Interference of this type is of course no fault of the transmitter. Getting rid of it is purely and simply a question of receiver design and construction. Unfortunately, there is no way to find out whether or not its proportions would be serious short of actual testing under conditions typical of amateur-transmitter and TV-receiver home installation. During the period of working out the NTSC standards there was no possibility of doing such testing, since there was no color transmission and less than a handful of laboratory color receivers.
About the first of this year NTSC adopted its final standards and announced plans for field-testing the system in the Spring. Concerned with the possibilities described above, and also the question of radiation from the 3.58-Mc. oscillator in the color receiver, ARRL Headquarters immediately addressed a letter to Dr. W. R. G. Baker, NTSC chairman, outlining the problem as we visualized it and offering to cooperate in field tests with a view to determining the actual facts. In the event that the interference situation proved to be a difficult one, it was suggested that the solution might be to move the subcarrier frequency. The time to decide such a question, of course, was before the standards became a part of the FCC regulations.

Dr. Baker’s response was immediate, and took the concrete form of appointing a special committee to study the question and report to the main body of NTSC.

The NTSC Ad Hoc Committee on Amateur-Color TV Interference

The rather formidable title above was the official designation of the group. Its instructions were, first, to study the interference possibilities both ways—interference to picture reception, and interference to amateur operations caused by radiation from the color circuits in the receiver. Second, to recommend to NTSC any tests that might be required to obtain needed information. Third, to submit to NTSC, as a result of the study and tests, a report on the degree of interference, together with any recommendations the committee might have to alleviate it.

The success of any committee depends principally on its chairman, who has to spark-plug its activities. This committee was particularly fortunate in that Dr. Baker appointed Earl I. Anderson, W2UE, of the RCA Laboratories Division, to the job. Earl in turn appointed committee members representing principal segments of radio engineering and industry, nearly all of them also active amateurs. The committee membership included K. A. Chittick, RCA Home Instrument Dept.; Larry G. Cumming, W4FB/W2YP, IRE; Donald G. Fink, W3TVI (yes, that’s the right call!); Philco Corp.; W. E. Good, W2CVI, G. E. Co.; Leopold Kay, W2GHA, CBS; W. W. MacDonald, W2TY, Electronics; Robert M. Morris, W2LV, ABC; Wendell Morrison, W2YCE, RCA LaboratoriesDivision; Phil Rand, W1DBM, Remington Rand (and ARRL consultant): Ben F. Tyson, W2PLR, Sylvania; and the writer. Even the one non-licensed member did not escape being tinted by the amateur brush, having been a ham in pre-World War I days. In other words, the committee membership was thoroughly familiar with the amateur viewpoint.

At its first meeting, the committee concluded that the only practical way to get started was to conduct some tests in advance of the formal NTSC field tests, the purpose being, as the chairman expressed it, to “get the feel of the problem.” The obstacles in the way of such testing were considerable. Practically every color receiver in existence was being worked on to get it in satisfactory shape for the coming field tests, so borrowing one for any period of time was out of the question. Even if that had been possible, there still remained the problem of getting a color broadcast signal on which to use it, and of finding a ham transmitter that would be useful for the testing — i.e., one that did not have harmonic output which would confuse the issue, that had at least moderately high power, and that was so situated that it, the receiver, and the signal could be brought together.

It was immediately obvious that, under the existing conditions, any test set-up would require bringing a complete ham station to the spot. This the League undertook to do. Through W2YCE, arrangements were made with the RCA Laboratories to make a color receiver available at Princeton, N.J., where broadcasting conditions could be simulated by putting the r.f. output of a modulated signal generator on an antenna.

The dates set for these preliminary tests, April 1st and 2nd, allowed us just a bit over two weeks to get a portable 80-meter ham station in shape. Thanks to earlier work in checking TV receiver performance, we had a high-power transmitter at Headquarters that gave us no worries on the harmonic score, but innumerable accessories were needed for completing an operating set-up that would permit assembly and testing with a minimum of wasted time and motion. Also, we could not be sure that there would be space available for installing such a station at all of the possible test sites. This, together with the fact that transportation time was an important element, posed so many difficulties that the solution was easy, although not cheap: a station wagon that became literally that — a station on

(Continued on page 118)

At the final meeting of the Amateur-Color TV Interference Committee, June 23, 1953, the members present were cajoled into lining up for this picture. Front row, in the usual order: Phil Rand, W1DBM; Earl Anderson, W2UE (Chairman); Ben Tyson, W2PLR; Bill Good, W2CVI; rear row, George Grammer, W1DF; Wendell Morrison, W2YCE; “Mac” MacDonald, W2LY (Secretary); Bob Morris, W2LV; K. A. Chittick, no call now but a pre-World War I ham. The location is the Sylvania Physics Laboratory, Bayside, L. I., where the NTSC field tests in which the Committee participated were conducted.
A 220-Mc. Station for the Beginner

Part II—The Transmitter

BY EDWARD P. TILTON,* WIHDQ, AND MASON P. SOUTHWORTH,** WIVLH

Just about all the rigs for 220 Mc. described in amateur publications in recent years have been complex crystal-controlled jobs. This is fine for the fellow with some experience in transmitter design and construction, but the cost and complexity of such gear have tended to keep the beginner out of the 220-Mc. picture. The prospect of having to build a multistage transmitter has been particularly frightening to many of the newcomers who need help the most: the Technician licensees who must, by nature of their tickets, make their start in amateur radio on 220 Mc. or higher bands.

The crystal-controlled transmitter and its logical companions in the receiving field, a crystal-controlled converter and a communications receiver, are ideal devices with which to exploit the possibilities of the 220-Mc. band. We want to make this clear at the outset. But they represent a tough technical problem for the fellow who is about to build his first ham gear, and they can run into considerable expense. The beginner's 220-Mc. station may well employ a less formidable approach.

The three principal components of our station are shown in the photograph on this page. At the right is the two-tube receiver described in detail last month. The little one-tube gadget at the left is the r.f. portion of the transmitter, a simple oscillator. The unit in the middle is the modulator. This is not the sort of equipment that will make you the 220-Mc. DX champ of your section, but it will do a creditable job. More important, it is of elementary design. You can build it. Anybody can.

*V.H.F. Editor, QST.
**Laboratory Assistant, QST.

Taming the Modulated Oscillator

V.h.f. beginners of a generation ago knew the modulated oscillator well. It was the means by which both the 5- and 2½-meter bands were populated, and you can find many greybeards today who think it served the purpose pretty well, all things considered. Its principal drawback, and one we cannot entirely overcome even today, is its tendency to shift frequency when the plate voltage is varied. As modulation is nothing more than varying the plate voltage at an audio-frequency rate, it is obvious that a simple oscillator such as this is going to suffer from severe frequency modulation if it is not designed and operated with care.

This frequency modulation need not be too troublesome, however. It's hardly noticeable, in fact, if you are listening with a receiver like the one described last month. It is only when we try to listen to the simple transmitter with a selective communications receiver that the effect of the f.m. is likely to be harmful. And even then, if the oscillator is well designed and the power supply and speech equipment are free from hum, the signal from our little rig can be made to sound very much like the narrow-band f.m. you hear on lower ham bands. It can be copied on all types of receivers in the same way, by controlling the level of the modulation (and consequent frequency deviation) to suit the selectivity of the receiver at the other end.

Thanks to today's vacuum tubes and specially-designed components we can build oscillators for 220 Mc. that are more stable than those we used on 56 and 112 Mc. in the early days of activity on those bands. Many of the tubes we can buy at low

Principal components of the 220-Mc. beginner's station are, right, the receiver previously described; left, the oscillator treated in this issue; and the modulator, center, to be described in a subsequent article.
cost today were designed especially for v.h.f. applications, whereas the bottles used in the 30s were made principally for service in the broadcast band! If the reader is a veteran of those days, we feel sure that he will be pleasantly surprised at the quality of the signal radiated by this modulated oscillator, 1954 model.

There are a few simple precautions we must follow, if we are to put out a good signal with a v.h.f. oscillator. First, as already mentioned, the power supply and speech equipment must be free from hum. That means plenty of filtering in the power supply, and good shielding and proper arrangement of parts in the modulator. Filament-type tubes are out for use in the transmitter, as a.c. applied to the filament would cause hum modulation of the signal. Second, the r.f. portion of the transmitter must be solidly built, so that there can be no vibration in the parts of the circuit that affect the frequency. No haywire is permissible here! Third, we must hold down the level of the modulation if we want the signal to be readable on a selective receiver. More than about 10 or 15 kilocycles frequency shift under modulation will make the signal sound pretty awful. You can use more audio when the fellow you're working is using any form of broad-band receiver, but if you want to keep from sounding like a buzz saw to the fellow with a communications receiver, you've got to keep that audio gain control turned away down!

One other thought to keep constantly in mind: the frequency of the transmitter can be shifted by all sorts of mishaps. It should be checked frequently, to be sure that it is within the amateur band. The Lecher wire device described later is the most reliable means of accomplishing this. There are commercial services operating on either side of the amateur band. Don't risk interfering with any of them!

Construction

The transmitter r.f. section (Fig. 3) uses a 12AT7 dual triode connected as a push-pull oscillator. Frequency is controlled by the length of the plate line, and by the setting of the tuning condenser, C1. The transmitter is built inside a 5 × 7 × 2-inch aluminum chassis (Bud AC-102), to which a bottom plate is affixed with self-tapping screws. The tube socket is mounted 1½ inches from one end of the chassis and oriented so that Pins 1 and 6, the plate connections, are toward the back and front of the chassis, respectively. The tuning condenser, C1, is mounted 1½ inches from the opposite end. The quarter-wave plate line, Lp, is made from No. 12 wire as described in the parts list, and supported by four 1-inch high ceramic stand-off insulators (National GS-1 with hardware removed) mounted 2½ inches and 3½ inches from the tube end of the chassis. If these insulators are mounted ¾ of an inch apart, and the wires are soldered to lugs mounted on the insulators, the line spacing will be correct. The inner stator terminals of C1 are connected to the proper points on the line by short wire leads. The shorting bar may be a piece of wire wrapped around each side of the line. This should be crimped in place, but not soldered permanently until after the frequency of the oscillator has been adjusted. The antenna coupling link (L1) is supported by two more ceramic pillars. These are mounted 1 inch apart and 3½ inches from the tube end of the chassis. A short piece of 300-ohm line is used to connect the link to the antenna terminal, a crystal socket on the rear wall.

The grid coil (not visible in the photograph) is mounted between Pins 2 and 7, and R1 is supported between the coil center-tap and a ground lug under a socket mounting nut. The cathode and heater center-tap connections (3, 8, and 9) are connected together and grounded through a self-supporting r.f. choke (RFC2). The heater pins (4 and 5) are connected to the tie-point in back of the tube socket through RFC3. RFC1 is supported between the end of the plate line and a tie-point near the tuning condenser. Heater and high-voltage leads are brought to a power connector on the rear of the chassis.

Adjustment and Operation

A power source capable of supplying 6.3 volts a.c. or d.c. at 0.3 amp, and 200 to 300 volts d.c. at about 40 ma. is required for testing the oscillator. Allow the heater to warm up and connect a 6.3-volt 250-ma. (blue bead) pilot lamp to a resistor across the antenna terminals before applying the plate voltage. Solder two short pieces of No. 12 or 14 bare wire to the bulb base and center contact, and bend these wires so that they will fit into the crystal socket/antenna terminal. Apply plate voltage, with a 100- or 50-ma. meter connected in series with the plate supply, and check the plate current. It should be about 25 ma. at 200 volts or 35 ma. at 300 volts. The pilot lamp should glow if the transmitter is oscillating. Another check for

The r.f. portion of the transmitter uses a single 12AT7 oscillator. The knob at the right is attached to the tuning condenser shaft.

QST for
oscillation, in case no light is seen in the pilot lamp, is to touch a pencil lead to the tube end of the plate line. If the tube is oscillating there will be a fluctuation in the plate current as this is done.

Fig. 3 — Schematic diagram and parts list for the 220-Mc. oscillator.
C1 — 10-µfd. per-section butterfly variable (Hammarlund BFC12).
R1 — 4700 ohms, 1/2 watt.
L1 — Hairpin loop, made from 3¼-inch length of No. 14 wire covered with spaghetti and bent at center around ½-inch diam. form.
L2 — Plate line made from two 6-inch lengths No. 12 timed wire with 1 inch bent down at tube end. C1 is connected to lines 3½ inches from bend and shorting bar is about 1 inch from C1. Wires spaced ½ inch center-to-center.
L3 — 3 turns No. 18 enam., ½-inch diam., and 5½ inch long, center-tapped.
J1 — Antenna terminal: standard crystal socket (Millen 33102).
J2 — 5-pin chassis fitting (Amphenol 86-CPS).
P1 — 5-pin matching cable fitting for J2 (Amphenol 78-PFS).
RFC1, RFC2, RFC3 — 10 turns No. 18 enam., ¼-inch diam., close-spaced.

Next, the frequency must be checked by some fairly accurate means. This can be a trusted wavemeter, a grid-dip meter with an accurate frequency calibration, or a Lecher-wire device such as that shown on page 38. The position of the shorting bar on the plate line should be such that the condenser will tune the oscillator over at least the full band, 220 to 225 Mc. Actually, the tuning range will probably be about 7 or 8 megacycles, so there should be some leeway at each end. When the position of the shorting bar has been set so that this tuning range is achieved, it may be soldered in place on the plate line.

Next, the spacing of the turns in the grid coil, L2, should be adjusted so that the transmitter efficiency is highest; that is, the highest output with the least plate current. The transmitter may now be tested on an antenna system, but the frequency should be checked immediately when the antenna is connected, as there is likely to be some change in frequency as the antenna is substituted for the dummy load. A listening check with the receiver is good enough for this purpose, as a transmitter of this type should not be operated close to the band edges. It is suggested that the frequency be kept between 221 and 224 Mc. as a precaution against accidental out-of-band operation. Keeping above 221 Mc. is particularly desirable, as most operation with crystal-controlled transmitters and selective receivers is in the first megacycle of the band. If we keep our oscillator rig above 221 there will be little likelihood that it will interfere with DX activity that may be taking place in that segment of the band.

Final adjustment of both the antenna coupling and the frequency should be made with the bottom plate fastened in place. The position of the coupling loop can be varied with a fiber rod or crochet hook, reaching through a hole drilled for this purpose in the bottom plate. The coupling should be the least that will transfer power to the antenna satisfactorily.

Making and Using Lecher Wires

The Lecher-wire device shown in the photograph and Fig. 4 on the next page is a convenient means for measuring actual wavelength by observing standing waves along a section of transmission line. The physical distance between two points of maximum current is measured on a metric scale, the length indicated being a half wavelength. A meter is 39.37 inches, or one centimeter is 0.3937 inch.

The two wires held taut by turnbuckles comprise the transmission line, and the block of wood with the metal plates attached is a carrier for the shorting blade mounted on the front of the block. The purpose of the metal plates on the side of the block, and extending down over the track along which the block slides, is to hold the carrier in alignment. They could be made of wood equally well. The top surface of the track is marked off in tenths of meters, beginning at a point directly under the coupling end of the line. A transparent scale marked in the metric system (graduated in centimeters) is mounted on the bottom of the carrier, as shown in the sketch. This type of scale can be found at any stationery counter. It should

November 1953
be about 12 centimeters long, so that about 2 cm. can be fastened to the underside of the carrier.

Mechanical details should be obvious from the drawing. The material used for the track and block is 1 x 2-inch pine, called “furring” in lumberyards. Two pieces are screwed together to form a stiff 7-section base, as shown in the drawing.

Checking the frequency of the transmitter may be done with the Lecher wires in several ways. If the rig is being tested on a lamp load the lamp may be connected at the end of a piece of 300-ohm Twin-Lead that is plugged into the antenna socket. The Lecher wires should also have a short length of Twin-Lead connected to the insulated end. The far end of this piece of line is shorted so that it can be used as a coupling loop. This coupling line and the section of line to which the lamp is connected are then taped together at a convenient point, as was shown in our cover picture last month.

Now we are ready to measure frequency. With the transmitter running, slide the shorting block along the carrier slowly, watching for a change in the brilliance of the lamp. When the light dims, note the reading on the scale. We’ll say, for example, that it is 0.255 meter. Now move the carrier along until the lamp dips again, and note the scale reading. Suppose it is 0.937. Subtract the first reading from the second, giving 0.6818 meter as the length of a half-wave. To convert this to megacycles, we divide 150 by the length of the half-wave just measured, and we find that our transmitter frequency is 220 Mc.

Best measuring accuracy is achieved with the least coupling between the Lecher wires and the lamp load that will give a flicker in lamp brilliance. Measurement may also be done using the oscillator plate current as an indication, and this method is recommended when the antenna is connected to the rig. Couple the Lecher wires to the antenna transmission line, as for the lamp load check, and measure the distance between the points at which a flicker is seen on the plate milliammeter.

The Lecher-wire measuring gadget is a very handy thing to have around. If the assembly is made 7 feet long it can be used for checking in the 144-Mc. band, and it is sufficiently accurate to be used well up into the microwave region. It’s the quickest and surest way to measure frequency on any amateur band from 144 Mc. up. It may be used to measure the frequency to which a super-regenerative detector is tuned by listening for a dip in the background noise, with the Lecher wire loop coupled to the detector tuned circuit.

Part II of a series. Details of the modulator, power supply and suitable antenna systems and control circuits will be discussed in a subsequent issue. A crystal-controlled transmitter for the fellow who wants to step up from the modulated oscillator is also scheduled for early appearance.

Close-up view of the coupling end of the Lecher-wire assembly. Details are shown above.
PI OUTPUT COUPLERS

130 East 24th St.
New York, N. Y.

Technical Editor, QST:

In connection with the current interest in pi-network output couplers, I feel that you should point out the need for (1) elimination of the "sub-harmonic" component before the grid of the final tube, (2) regard for lower-than-output frequency response of antenna tuner and antenna, and (3) a careful check on the air to insure no troubles with "sub-harmonic" radiation, just as with harmonics.

At short, half frequency, the pi network may present even less impedance to the tube than a parallel-plate tank of equivalent Q, but if the load resistance is placed directly across the output condenser of the pi (coax-fed dipole, for example), there is a fair amount of sub-harmonic fed to the load under many conditions. For example, I'm at present having difficulties with a near-by 1-kw c.d. station on 3.5 Mc. whose harmonics are 89 right through 21 Mc. On the other hand, they find me 100 per cent readable (although weak) on 11.5 Mc. when my rig is on 21 Mc. High attenuation in the buildings next to me, whether it is in the city or close to one another that we need more rejection than is obtained by the pi network working directly into the antenna.

-- Eugene Black, jr., WZGEO

[The condition is worst when one arrives at a set of adjustments that makes the tank Q too low. With the wrong combination thing will act like a low-pass filter and will have almost no discrimination against low-frequency spurious signals. It is particularly easy to do this when trying to work into a random wire. The selectivity of the network is not bad if it runs the same operating Q as in a normal tank circuit. When a continuously-variable inductance is used, it is fairly easy to get a poorest of adjustments, and WZGEO's point is one well worth watching out for. -- Ed.]

TORNADO TRACKING

P.O. Box 21
Henderson, Tenn.

Technical Editor, QST:

Tornadoes are tracked by radar and by conventional direction-finding equipment, but I have been using a third method that seems to offer some advantages, and it can be done by amateurs with little extra equipment. Radar tracking is based primarily on the water-vapor content of the cloud and so does not distinguish well between tornadoes and large cloud formations. The d.f. method is based on electrical discharges within the tornado and therefore other types of clouds are not indicated. My method is somewhat similar, in that it uses a TV receiver to track the electrical discharges.

For equipment, one requires an old-model TV receiver, preferably an RCA 630, with means for controlling the a.g.c. sensitivity or a switch for disabling the a.g.c., a rotatable Yagi antenna for the TV channel to be used, and a signal generator capable of introducing a signal in the TV channel. An a.m. broadcast or communications receiver is also necessary.

First, it is necessary to learn, by listening to any a.m. receiver on any frequency range, whether or not a signal exists. This is done by noting the type of QRN that is present. If the QRN is heavy and comes in isolated crashes of varying intensity, then you are listening to a group of widely-separated thunderstorms. If there is no QRN, there can be no tornado or thunderstorm. Tornado static sounds like someone stirring a shovelful of gravel on a metal roof, or like pebbles rolling down a metal drainpipe. One must learn to distinguish between this and the isolated crashes of thunderstorms.

Once you hear the tornado-type static, you are ready to try to find its bearing. With the TV receiver tuned to an (in your vicinity) unused channel and the a.g.c. disabled or reduced, introduce a signal (dummy carrier) from the signal generator to produce an almost-black screen. As the antenna is rotated, a bearing will be found where each "shovelful of gravel" heard in the a.m. receiver will produce high silver streaks across the TV screen. (The new "black-and-white" picture tubes produce only black disks or streaks.) When the antenna is at right angles to the storm bearing, no streaks will be seen. To sharpen the bearing on the tornado, gradually increase the level of the dummy carrier until the streaks on the screen can be seen over only about 5 or 10 degrees of antenna bearing. If simultaneous bearings are taken by two or more stations, the intersection of the bearings gives a "fix" and the location of the storm. Consecutive fixes will give the course and speed of the storm. Bearing accuracy of 5 degrees is quite sufficient for locating storms at distances up to 100 miles, but greater accuracy is desired as the distances are increased. I have confirmed bearings with 5-degree accuracy up to 550 miles, and I have "heard" tornado activity as far away as Minnesota and West Texas. This system is not something that "may work" -- it does work.

One thing that should be recognized at the start is that a tornado cloud without a tail, and causing no damage on the ground, is still a tornado and will slip by posing as an ordinary thunderstorm. At any moment, however, it may swoop down and destroy life and property. With my system, the tailless tornado can be detected just as well as those that wrecked Waco, Flinth, Warren-Robbins, Henderson, Judeonia and other places. With a network of stations taking bearings on these things, it should be possible to warn whole areas of the impending danger hours in advance. In other words, a tornado cloud may have a base 5000 feet in the air and still be just as dangerous as one at a lower altitude; yet it would hardly be noticed from the ground. Within the past few months I had the good fortune to track one that passed 8 miles to the north of me, and as I took bearings with the TV lash-up, I was also able to check by visual bearings. I tracked this particular storm from a few miles east of Memphis until it passed northeast of Henderson. These communities along the path were all that reported damage, to a total of six dwellings. As this specimen passed within sight it was noted that the visible base was more than 5000 feet above the ground.

With trained amateurs and properly-equipped stations, a network could be established for tracking tornadoes and supplementing the other amateur emergency services. Right now one of our bottlenecks is suitable rotators for the necessary Yagi antennas.

-- James Milliken, W4AGC

[Image: Strays]

Nine-year-olds Peter and Michael Blumenfeld, WN1YZZ and WN1ZAZ, are most probably the youngest licensed-amateur fliers in the world. From an early age, father WITFT (ex-W2CVO), who has had his own ticket for 23 years, finds it difficult to reconcile the boys' early bedtime with WIAW code-practice hours.

November 1953 39
A Coaxial Antenna for Ten Meters

A Self-Supporting Vertical Antenna for Restricted Space

BY HARRY M. NEBEN, W9YVZ

- The vertical antenna, especially when self-supporting, is always attractive when space is at a premium. Here is a way to build a ten-meter coaxial antenna without resorting to special fittings. It's especially good for "ground-wave work" and for contacting mobiles.

The ham who has an antenna space problem and yet desires efficient operation on the ten-meter band may well want to consider a vertical antenna. A suitable vertical antenna can be made self-supporting, and is nondirectional. For fixed-station-to-mobile operation, the vertical antenna gives consistently better results than a horizontal antenna.

The antenna at W9YVZ is of the coaxial type, and not only works well but is very inconspicuous. When constructed as described, it is scarcely noticeable in the yard and thus dispels any objections from the landlord or XYL. In fact, at W9YVZ the antenna doubles as a support for the Monday wash line.

The Vertical Antenna

The common type of end-fed vertical antenna has a tendency to have serious feed-line radiation when fed with an open line. The use of coaxial feed may materially reduce line radiation provided the antenna is properly decoupled from the outside of the coax. A concentric J antenna for wide frequency band operation or a coaxial antenna for narrow frequency band operation will provide this decoupling and also will provide a suitable match to the coaxial cable. The coaxial antenna has enjoyed great popularity in the past in narrow-band commercial v.h.f. stations where a non-directional vertical radiator is required, and a low radiation angle is desired.

The concentric J antenna, a rather recent development, has proved its superiority where maximum transfer of energy to the antenna over a wide frequency range is essential. However, for ham applications, the coaxial antenna performs adequately and is easy to construct in the home workshop.

In the coaxial antenna, the center conductor of a 70-ohm coaxial transmission line or cable is extended one-quarter wavelength beyond the end of the cable and acts as the upper half of a half-wave antenna. The other half of the antenna is provided by a quarter-wave sleeve, the upper end being connected to the outer braid of the coaxial cable, as shown in Fig. 1. The coaxial feed is run through the sleeve and very little current is induced on the outside of the line by the antenna field. The feed line of the coaxial cable is practically nonresonant since its characteristic impedance is quite close to the center impedance of a half-wave antenna.

Antenna Construction

The coaxial antenna consists of an upper metal radiator, a metal sleeve section, and

![Diagram](image_url)

Fig. 1 — Basic construction of the coaxial antenna. Lengths are electrical, including allowance for length/diameter ratio.

support mast. The components of this antenna were obtained from a surplus store, the tinsmith shop, and the local plumbing shop.

The upper radiator is a surplus whip antenna still available in most surplus stores. However, a mobile whip antenna may be used in place of the surplus antenna and with its insulator may even simplify the construction. The mounting insulator for the whip section is a surplus porcelain feed-through insulator with a feed-through hole which just permits the end of the whip to pass through. The paint was removed from the end of the whip, a washer soldered to the whip about 3 inches from the end, and the end of the antenna whip threaded as shown in Fig. 2. This permits the antenna and insulator to be secured to the sleeve cap much as one would tighten the feed-through insulator to a panel, and provides a lug for connecting the center conductor of the coaxial cable to the antenna whip section.

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*% American Phenolic Corporation, 1830 S. 54th Ave., Chicago 60, Illinois.
The sleeve section of the antenna consists of an 8-foot length of 3-inch galvanized iron air duct, and was obtained at the local tinsmith shop. The sleeve section is 2 inches shorter than the whip section of the antenna in order to compensate for the difference in diameters of the whip and sleeve sections. Originally, both the whip and sleeve radiators were made the same length; however, when an effort was made to reduce the standing-wave ratio on the line, it was found it was necessary to shorten the sleeve section. This substantially reduced the standing-wave ratio.

The cap of the sleeve is a pipe cap which just slips into the antenna sleeve and was obtained from the plumber's shop. The hole for the upper radiator feed-through insulator was cut with an ordinary fly cutter. The pipe caps are usually cast iron and cutting the hole was fairly easy.

A hole is drilled off center to permit making the connection between the coaxial cable and the upper whip section and the sleeve section. The galvanized iron sleeve section is fastened to the pipe-cap skirt by means of self-tapping sheet metal screws.

The mast consists of a 20-foot length of 1-inch galvanized iron pipe. A half-inch hole is drilled in the pipe about three inches from the top and another 14 feet from this end; these are for entrance and exit of the coaxial cable. The holes were slightly elongated by "wobbling" the drill to permit easy passage of the coaxial cable. However, these holes are not really necessary as the coaxial cable may be run outside the mast if desired.

Two blocks of wood are next whittled to serve as centering devices for the sleeve section of the antenna. Both are of pine, varnished before installation, and lend no support to the antenna. One piece serves to center the mast on the sleeve cap. This piece in some cases may not be necessary as the mast may center itself on the feed-through insulator in the sleeve cap. The other, or lower, block is mounted on the base of the sleeve and maintains the sleeve in alignment with the mast. It was found that without this lower block the wind blowing across the open end of the sleeve section caused a low-pitched whistle to be set up by the sleeve hollow. Until the cause of the noise was discovered the neighbors asked if the ghosts formerly on their TV sets were now haunting the ham bands!

The antenna is fed by 70-ohm coaxial cable. For low-power work RG-59/U may be used, but for higher power RG-11/U should be used. The RG-11/U has lower loss than the RG-59/U and is recommended. The coaxial cable is fed through the lower hole in the mast and is "fished" through the upper hole and through the hole in the sleeve cap. About three inches of outer jacket is removed from the cable and the braid fanned out from the cable and soldered to a lug on the sleeve cap. The center conductor is

(Continued on page 126)
On the Air with SINGLE SIDEBAND

ZS2GA and ZS6WG can lay claim to the first ZS two-way s.a.b. QSO. Although ZS6KD and ZS2GA were the first two on the air (and in that order) they were never able to get together on the same band and at the same time. ZS2GA reports his best two-way DX as 45-minute QSO with 3A4MC on 14 Mc. The KA uses a 3-element beam and a kw on peaks, which helped to make him "living-room copy" in Port Elizabeth. ZS2GA is writing a series of s.a.b. articles for Radio ZS, the official magazine of the SARL—the first article (and a good one) appeared in the August issue. The West Coast had a s.a.b. dinner and get-together in San Francisco during August, with many of the Los Angeles gang in attendance: W3GZQ, WS6 LWD GEG NCK PGY OVM JPU PSQ EDD LZE EPX GGM UHM FAQ CIN PYH US and HLY (ex-W3MBY).

A VFO for the 10-A Exciter

A VFO is not yet available for the popular Central Electronics 10-A exciter, and Wayne Cooper, YNI1WC, sends along the circuit (Fig. 1) he is using for the purpose. "... the Clapp oscillator tuned circuit is external, and plugs into the VFO Socket" in the back of the 10-A. It is similar in construction to those external units that have appeared in past QSTs, I don't recall any mention of it before, but a crystal can be inserted in place of the tuned circuit, and I use it that way for crystal-controlled operation... The selection of tube and voltages was carefully made. A 6V6 gives too little drive, and a 6AG7 gives too much with 75 volts on the screen. This regulated power supply is 'built in' by installing a socket between the final tube and the power transformer, where there is plenty of room both above and below, and R6 and R7 are then connected to the VR tube as shown. For 40 meters, along with changing the exciter coils, it is necessary to change the VR tube to an 00X, to give 150 volts on the screen and proper excitation. Along with changing from 20/80 to 40 meters, it is necessary to switch the coils in the VFO plate circuit. The d.p.d.t. switch was mounted on the front panel in place of the old crystal socket, as I use the VFO-X.T.AL switch to switch in and out a built-in 1300-cycle test oscillator. The wiring to it is open and in the clear. The 'VFO Socket' is an octal socket mounted behind Lr. Lr is not needed as a harmonic trap, so it serves nicely for the 5-Mc. plate tank. I use high-Q here to reduce the harmonic output for 30-meter operation and also, to help a little more, the 15-Mc. tank is left in series with the plate. This 15-Mc. tank is a few turns of No. 10 wire, air-supported, with its condenser between Lr and Pin 8.

Correction of W6HLY Peak-Control Circuit

Dave Mann, W6HLY, points out that his circuit for peak-control in a linear amplifier (Fig. 2, page 49, QST, March, 1950) is in error. The 0.01-mfd. condenser C1 should be connected from cathode to ground instead of as shown. As is, it makes the recovery time too long.

Moving I.F. Crystal Frequencies

As anyone who has been following the literature on crystal-lattice filters and the Edmunds exciter knows, there are times when it is convenient to be able to shift the frequency slightly or to match up a pair or more of the surplus i.f. crystals. The mail this month brings several slightly different approaches to it — they're being passed along with the thought that one or more of the ideas will come in handy some day.

W3USX tried the copper-plating techniques mentioned in the April column, and found out the hard way that the strength of the solution wasn't nearly as important as the strength of the current. His experiments indicate that 1 ma. is about the top current that should be run, and he controls this readily by the depth to which he inserts the copper-wire electrode in the solution. He says, "I used a small copper wire and inserted just enough wire to bring the current to 1 ma. Very shortly, the current will drop, but do not attempt to bring the current back up. Any motion of the crystal being plated will bring the current back without disturbing the opposite electrode, and if more wire has been inserted the current will rise too high if something should disturb the solution or the crystal in it."

W7CJB finds that he can increase the frequency of the FT-241 crystals by the copper-sulphate method described in April, by reversing the battery polarity. He has moved them as much as 500 cycles higher without losing any activity. The method apparently removes some of the original silver plating — if the frequency goes too high you can reverse the battery and copper plate the crystals to decrease the frequency. One crystal was moved 1600 cycles lower after having first been raised 400 cycles.

W4ORB has found that he can move the crystal frequencies as much as 2 kc. lower by lightly rubbing cold soft solder on the plated faces. Small changes can be made by making marks with a No. 2 pencil on the plated faces or on the solder already rubbed on. Don finds it convenient to use solder first, and then "score in" on the last 100 cycles or so with pencil. A small eraser will remove the pencil marks if you go too far. Small moves of only a few cycles can be made with a fine pencil point. The crystal should be steamed while undergoing treatment by holding the two opposite edges lightly between the fingers and taking care not to flex or stress the mounting more than necessary.

Voice-Controlled Break-In with a Loudspeaker and No Relays

Ray Brandt, W9LJ, Janesville, Wis., uses the circuit shown in Fig. 2 to give him smooth break-in with a loudspeaker, and it has the additional attraction that no relays are required. The unit delivers — 90 volts blocking bins for...
Fig. 2 — This voice-control circuit requires no relays and permits loudspeaker reception. 
$\text{T}_1$ is a midget a.c.-d.c. output transformer with the low-impedance winding connected to the "speaker voice coil."

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the transmitter and −65 volts blocking bias for the receiver. These biases exist at either full value or not at all, so the action is positive.

In the "receive" condition, audio from the receiver (speaker) is rectified by the right-hand diode and holds the right-hand 6AGS conducting. The left-hand diode is also rectifying audio picked up from the speaker and passed through the speech amplifier, but the setting of the "Threshold" control holds the left-hand 6AGS just below cut-off. Talking into the microphone unbalances this condition but causes no output in the receiver until the circuit is tripped, because the transmitter is off. Once the circuit is tripped, the receiver no longer delivers audio, and the bias developed by the right-hand diode decays. The transmitter is held on until the rectified output of the audio from the speech amplifier decays below the threshold value.

W9LJ adds that if the receiver is to be disabled by applying the −65 volts to the a.v.c. bus, it is recommended that the bias be applied through a diode, the plate to the a.v.c. bus and the cathode to the "disable receiver" lead. This also requires that there be some resistance left between ground and the a.v.c. bus, of course, when the a.v.c. is switched off for s.s.b. reception.

The time constants of the diode circuits can be made variable, but the values shown have proved quite satisfactory at W9LJ. Mica condensers are to be preferred to stabilize the time constants under various conditions of temperature and humidity. — B. G.

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**W9MQK — Compact . . . Convenient . . . Compatible**

W9MQK's "Sheraton half-kilowatt" is a beautiful example of parlor-station design. Assembled of ⅛-inch plywood with blonde mahogany finish, the cabinet conceals a 14-Mc. "phone-e.w. transmitter using p.p. 811As modulated by 611As, plus VFO, receiver, and other operating essentials and accessories. The beam indicator, not enclosed, is decorative enough to pass the XYL's inspection. W9MQK is close to DXCC with this installation.

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**November 1953**
DIRECTOR ELECTIONS

In four of the eight ARRL divisions currently holding elections, incumbent directors have been returned to office without valid opposition, remaining on the job for another two-year term beginning January 1st. They are Canadian Division Director Alex Reid, VE2BE; Dakota Division Director Alfred M. Gowen, W6PHR; Great Lakes Division Director John H. Brabb, W8SPF; and Midwest Division Director William J. Schmidt, W9OZN. Paul M. Bossoletti, W9GZD, was named a candidate for the Dakota post, but was found ineligible because of insufficiency of continuity of membership. Robert W. Demnston, W9NWX, and Albert J. Ploog, W8SCA, were named candidates for the Midwest directorship, but also were found ineligible because of membership lapses.

Charles O. Badgett, W3LVF, continues as Vice-Director of the Atlantic Division for two years; John W. Gore, W3PRL, was named a candidate but ruled ineligible because of a membership lapse. George S. Acton, W5BMM, retains the Vice-Director post in the Delta Division, and James E. McKinn, W9MVG, in the Midwest Division, both with no opposition.

Forrest Bryant, W5FDS, has been declared elected as Vice-Director of the Dakota Division, taking office next January for a two-year term. Charles G. Compton, W9EOU, was named a candidate but ruled ineligible because of his occupation in radio manufacturing. OM Bryant was first licensed in 1919, and has been particularly active in the Minneapolis Radio Club, holding various offices therein.

Robert L. Davis, W8EYE, becomes the new Vice-Director of the Great Lakes Division, without opposition. Factory representative for a pump manufacturer, OM Davis was licensed in 1923; he has served as assistant director, and has been active in Ohio club affairs, serving not only as president of the Columbus Amateur Radio Asso., but also as chairman and currently vice-chairman of the Ohio Council of Amateur Radio Clubs.

The remaining offices are contested, and balloting is now in progress.

NEW SOUTHEASTERN DIRECTOR

Upon the resignation of Lamar Hill, W4BOL, for reasons of business pressure, and pursuant to provisions in the Articles of Association, Ernest W. Barr, W4GOR, on September 14th took over the post of Director, Southeastern Division, for the remainder of the term ending this year.

4TH QUARTER EXAM SCHEDULE

FCC has now released its schedule of examinations to be conducted by traveling engineers during the last part of 1953. The usual arrangements continue at the district offices. Below we list cities, and dates where known, on the November-December itineraries:

- Birmingham, Alabama: Dec. 3
- Charleston, W. Va.: sometime in December
- Cincinnati, Ohio: sometime in November
- Cleveland, Ohio: sometime in December
- Corpus Christi, Tex.: Dec. 10
- Ft. Wayne, Ind.: sometime in November
- Fresno, Calif.: Dec. 16
- Indianapolis, Ind.: sometime in November
- Jackson, Miss.: Dec. 9
- Knoxville, Tenn.: Dec. 17
- Louisville, Ky.: sometime in November
- Nashville, Tenn.: Nov. 5
- Pittsburgh: sometime in November
- St. Louis, Mo.: sometime in November
- Salt Lake City, Utah: Dec. 18
- San Antonio, Tex.: Nov. 5
- Schenectady, N. Y.: Dec. 2-3, 9 A.M. and 1 P.M.
- Sioux Falls, S. D.: Dec. 9, Novice and Technician at 10 A.M.; others at 1 P.M.
- Williamsport, Penna.: sometime in December
- Wilmington, N. C.: Dec. 5
- Winston-Salem, N. C.: Nov. 7

MERIT AWARD TO RAND

The first ARRL Merit Award, to be given annually to an amateur "chosen for his outstanding technical contributions to the art of amateur radio communication," has been made to Philip S. Rand, W1DBM, for his excellent work in the field of television interference elimi-
standing pioneer in tackling the problem, not only coming up with technical solutions in many cases but, and even more important, inspiring amateurs throughout the country to lay aside defeatist attitudes and get busy with soldering iron, filtering and shielding materials to follow his lead. In fact, his work is so well known that it makes unnecessary the recapitulation of accomplishments which would normally accompany a report on the Merit Award. Suffice it to say that amateur radio is in a much healthier and stronger position now for having had as enthusiastic and aggressive and indefatigable a member of the fraternity as Phil Rand. The plaque itself is only a symbol of the sincere appreciation which every amateur would like to express.

NEW HAMS AT HQ.

The noon hour at 38 La Salle Road acquired a new look starting a few months back — small groups of the office gals poring over the License Manual, or eating a sandwich from one hand while using a code practice oscillator with the other, or intently watching a volunteer instructor (also sandwich in hand) drawing diagrams on a makeshift blackboard and explaining some of the simpler workings of basic radio circuits. The embryo of curiosity about ham radio, which in the past had developed spasmodic but half-hearted attempts to obtain a ticket, had finally blossomed into a deadly serious intent. And of seven starters, seven finished and passed the Novice exam with flying colors; two have since become Technicians, while the remaining five continue their noon-hour theory and code sessions. Most of the gals have already been on the air with borrowed gear; right now there's an assembly line in the Lab during noon and after hours, where they are building transmitter kits they purchased. Much of the guidance has been furnished by Ellen White, W1YYM, Asst. Comm. Manager, 'Phone. Another flurry of interest like this among the remaining gals, which might happen in self-defense, and the OMs at Hq. will almost be outnumbered!

F.C.C. PROPOSES NOVICE, TECHNICIAN EXAMS BY MAIL

In early October FCC released a notice of proposed rule-making to:
1) make Novice and Technician examinations available by mail only;
2) reduce to 50 miles the present 125-mile limit determining eligibility for a Conditional Class license.

These proposals are considered least disadvantageous to the amateur service among the numerous methods available to FCC to cut down the expense of its field examinations as required by the economy-minded administration. Under the proposal, all aspirants for Novice or Technician licenses, no matter where they lived, would take their examinations by mail according to procedures already specified in the regulations for Conditional Class licenses. Further, aspirants for the General Class privileges who live more than 50 miles from a quarterly examining point (instead of the present 125 miles) would be eligible to take the exam by mail, of course getting a Conditional Class ticket with the same privileges.

Comment must be filed by December 31st.

CHANNEL STRIP TVI

As discussed on our editorial page this month, there is a newly-discovered potential source of TVI from amateur 2-meter operation — again, through no fault of the transmitter. The League has requested the continued cooperation of the FCC in handling complaints which may come from this source, by means of the following letter filed in late August:

(Continued on page 180)
Announcing the 20th ARRL Sweepstakes

Certificates to C.W. and 'Phone Winners in Each Section
and to Top Club Scorers; Special Novice Awards

<table>
<thead>
<tr>
<th>CONTEST PERIODS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time</strong></td>
</tr>
<tr>
<td>EST</td>
</tr>
<tr>
<td>CST</td>
</tr>
<tr>
<td>MST</td>
</tr>
<tr>
<td>PST</td>
</tr>
</tbody>
</table>

Time for the Sweepstakes again! This popular annual activity affords you an opportunity to pit your operating skill against the best men in your ARRL section, and fill in the states you need for WAS. Every licensed amateur in every League section is urged to participate. Whether or not you're an ARRL member, you are cordially invited to get into the SS and submit an entry. All scores reported in accordance with the rules will be listed in a QST tabulation of final results.

The rules are the same as those of last year with one exception: For the first time, a special c.w. certificate will be awarded to the highest scoring Novice or Technician in each ARRL section where at least three such licensees submit c.w. logs; similarly, a 'phone certificate will be awarded in each section. These special awards are in addition to the customary certificates to 'phone and c.w. section winners and to top club scorers. Novices and Technicians will find fun galore in the SS — and at the same time build up code speed and familiarity with traffic-handling procedure.

The contest will run over two consecutive week ends, as in the past, with a maximum allowable total operating time of 40 hours out of the possible 48 for each entry ('phone or c.w.). You may operate both 'phone and c.w., but separate logs must be filed for each mode.

The Sweepstakes, like Field Day, puts a premium on operating skill rather than on power, since the score multiplier (1.25 on c.w., 1.5 on 'phone) for stations operating with 100 watts or less insures that much of the operation will be in this category. The low-power man can really go to town in the SS!

If you're new to the SS, it won't take you long to catch on. During the contest period, call "CQ SS" or answer such a call, exchange preambles in the form shown elsewhere in this announcement, and keep your log properly. ARRL will gladly send you contest forms upon request, or you can draft your entry in accordance with the sample. Although it is not required by the rules, more operators each year are using the 24-hour time system in their SS exchanges. Under this system, midnight is 0000, 12 noon is 1200, 6:30 P.M. is 1830, and 11:59 P.M. is 2359.

For the purposes of this contest let us clarify the status of stations in certain areas even beyond the listing of ARRL sections on Page 6. All VE8s in N.W.T. may be considered attached to the Yukon section; likewise Swan Island (KS4) is part of West Indies, and Newfoundland (VO) and Labrador (VO6) count as Maritime.

Entries by multiple-operator stations are encouraged and will be listed, but only single-operator stations will be eligible for the certificates offered to the top 'phone scorer and the top c.w. scorer in each section. Multiple-operator scores can be grouped with single-operator scores in club competition, however, and a handsome gavel is offered to the club with the highest aggregate score. Within a club, single-operator entries can compete for the "club-certificate" awards given to the top c.w. and 'phone scorers.

Whether you prefer 'phone or c.w. work, there will be plenty of stations eager to exchange SS information with you. 'Phone activity will be lively with 7 and 21 Mc. available to the A3 contingent for the first time in an SS, and Santa Barbara will provide a new section multiplier. So ready your equipment for action now, read over the rules to acquaint yourself with the details, and then stand by for two week ends of operating you'll really enjoy.

Rules

1) Eligibility: The contest is open to all radio amateurs (or officially attached to) sections listed on Page 6 of this issue of QST.

2) Time: All contacts must be made during the contest periods indicated elsewhere in this announcement. Time may be divided between weekend days as desired, but a total of 40 hours must not be exceeded for each entry. Times spent in listening counts as operating time.

3) QSOs: Contacts must include certain information sent in the form of a standard message preamble, as shown in the example. C.W. stations work only c.w. stations and 'phone stations only other 'phones. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your preamble and/or receipt of a preamble.

HOW TO SCORE

Each preamble sent and acknowledged counts one point.

Each preamble received counts one point.

Only two points can be earned by contacting any one station, regardless of the frequency band used.

For final score: Multiply totaled points by the number of different ARRL sections worked; that is, the number in which at least one bona fide SS point has been made. Multiply c.w. scores by 1.25 and 'phones scores by 1.5 if you used 100-watt-or-less transmitter input at all times during the contest.
EXPLANATION OF "SS" CONTEST EXCHANGES

<table>
<thead>
<tr>
<th>Exchanges</th>
<th>Call</th>
<th>CK</th>
<th>Place</th>
<th>Time</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contest info, numbers, 1, 2, 3, etc., for each station worked</td>
<td>Send your own call</td>
<td>CK (RST report of station worked)</td>
<td>Your ARRL section</td>
<td>Send time of transmitting this NR</td>
<td>Send date of QSO</td>
</tr>
</tbody>
</table>

Sample | NR. 1 | W1AW | 589 | CONN | 1812 | NOV 14 |

4) Scoring: Each preamble sent and acknowledged counts one point. Each preamble received counts one point. Only two points can be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see p. 6) worked during the contest is the "sections multiplier." It is not necessary for preambles to be sent both ways before a contact may count, but one must be received, or sent and acknowledged, before credit is claimed for either point(s) or multiplier. Apply a "power multiplier" of 1.25 to c.w. entries and 1.5 to "phone" entries if the input power to the transmitter output stage is 100 watts or less at all times during contest operation.

The final score equals the total "points" multiplied by the "sections multiplier" multiplied by the "power multiplier."

5) Reporting: Contest work must be reported as shown in the sample form. Lithographed contest forms will be sent gratis upon receipt of radiogram or postcard request. Indicate starting and ending times for each period on the air. All Sweepstakes reports become the property of ARRL. No contest reports can be returned.

There are no objections to one's obtaining assistance from logging, "spotting" or relief operators, but their use places the entrant in the multiple-operator class, and it must be so reported.

A single-operator station is one manned by an individual amateur who receives no assistance from other persons during the contest periods. He may not have assistance in any manner in keeping the station log and records, or in spotting stations during a contest period. The operation of two or more transmitters simultaneously at single-operator stations is not allowed. Contest reports must be postmarked no later than December 9, 1953, to be eligible for QST (Continued on page 188)

Sample of report form that must be used by contestants

STATION W...—SUMMARY OF EXCHANGES, TWENTIETH A.R.R.L. ALL-SECTION SWEETWATYES

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Time (On or Off Air)</th>
<th>Sent (1 point)</th>
<th>Received (1 point)</th>
<th>Number of Each Different New Section as Worked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band (Me.)</td>
<td>Time: 3 hrs. 35 min.</td>
<td>NR</td>
<td>Stn.</td>
<td>CK-RST Section</td>
</tr>
<tr>
<td>3.5 On 1810</td>
<td>1</td>
<td>W1AW</td>
<td>589</td>
<td>Conn.</td>
</tr>
<tr>
<td>7 Off 2115</td>
<td>2</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>3.5 Off 2115</td>
<td>3</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>Total Operating Time: 5 hrs. 55 min.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assisting person(s): name(s) or call(s): ..................................................

Claimed score: 22 points x 10 sections = 220 x 1.25 (85 watts input) = 275

I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is correct and true to the best of my knowledge.

Signature ........................................

Address ....................................

Tube Line-Up ................................

Number Different Stations Worked .................

November 1953 47
"I Have Observed All the Rules . . ."

BY CHARLES L. WOOD, W2VMX

SIGN it on the dotted line . . . and mail your winning entry in another ARRL contest activity. Feels good, doesn't it? Nothing to do now but sit back and wait for QST to bring the good news, followed shortly thereafter by a smiling letter carrier with another winner's certificate for the Lower Podunk section. Wonder if anybody looks at these logs, anyway?

Old man, it might surprise you to know just how thoroughly your log is checked, whether a simple post card confirming a single contact with a friend or a thirty-page Sweepstakes entry ARRL employs a full-time amateur for the specific purpose of seeing that all of our contest activities are fairly won and honestly scored. This person is responsible for almost everything that happens in the handling of contest logs and results except matters of policy, such as rules changes and disqualifications. These are handled by a special committee. Would you be interested in watching the contest checker at work for a while? Look over his shoulder — if you can see over the pile of logs . . .

It is a day early in February, and the time has come to wind up the Sweepstakes contest which took place back in November. For many weeks the checker has been sorting and verifying, correcting where necessary. About 1200 logs are piled neatly on the desk, together with a myriad of letters, radiograms and club correspondence, all of which refer to the contest in one way or another. The day's mail is in a side basket; a glance shows that it contains assorted reports from the Novice Round-up, the January CD Parties, both 'phone and c.w., cards for the February LO-Party, some OO reports for the DX contest file, and a few late logs for the V.H.F. Sweepstakes which may be added to the results if space permits.

Today, the checker is looking through the Sweepstakes for the last time before typing these results for publication in QST. He must see that every log has been classified correctly as a 'phone or c.w. entry, single or multiple operator, and that the logs are arranged according to ARRL divisions and sections in order of descend-

ing score. Multiple-operator entries are at the bottom of the pile, together with a few non-competing logs.

At the fourth or fifth log from the top he stops and shakes his head sadly. "This guy probably would have come in second, if we could only read the stuff." And he displays something which would pass for a light carbon copy of an Egyptian papyrus of the second century B.C. "No station can receive credit for a contact when we cannot see the call of the station he worked," the checker explains. Sounds fair enough, doesn't it? Elsewhere on this log we note small red check marks where this entry has been compared with others to confirm contacts claimed.

Now the checker smiles broadly as he pulls from another section a log of many pages. "Here," he explains, "is another man who might have won. He has done something never before accomplished in a Sweepstakes — worked 89 sections! Guess he never did look at Page 6 in a copy of QST, did he?" Quite a feat, indeed, considering that there are only 73 ARRL sections. He worked perhaps 65 or 66 of them . . . Not content with working Virginia and West Virginia, he has worked Eastern Virginia and Southern Virginia. He has counted Delaware, Maryland and the District of Columbia separately, although they are all one section. Then, too, he has worked a couple of really rare sections, such as Western Montana and Central Texas. Well, his disappointment will serve to arouse his curiosity about such things, and may save him grief the next time.

Sensing your interest in the grading of these papers, the checker explains that almost 50 per cent of all incoming logs must be changed in some respect. Perhaps one in ten undergoes a major change in score. Some go up, some go down.

Chief reasons for upgrading are omissions made by beginners in the contest game. These include such errors as failing to count full QSO points, or multiplying contact points times states or divisions instead of sections. Few complaints, of course, will come from this group. Some, however, will write Hq. to find out why their scores were increased.

Most of the major changes are downgraded

(Continued on page 189)
A glance at the Brass Pounders League tabulation each month for the past nine issues of QST (January through September, 1953) has revealed some interesting facts. Each month at least three YLs have been listed, and in four of the months, five YLs have "made it." W2RUF and W3CUL placed high on the list for six of the nine months, and W2BTB made it seven times and topped everyone (OMs too) with the highest score in the last month analyzed, September.

The survey period was arbitrarily chosen—the past nine months simply because of recent reference value. We all know that W3CUL has consistently placed high, often first, for a number of years (she has made BPL more than sixty times); and numerous other YLs have been listed at various times. Also, a number of YLs handle enough traffic each month to warrant places in BPL but for one reason or another their calls do not appear.

This is all realized, but it is not our purpose at this time to go into these aspects. In singling out the seven YLs who have made BPL more than three times in the past nine months, we have tried to uncover why these girls handle so much traffic and how they manage to do it consistently. Each has her own story.

W3JU, Peggy—"I like to handle traffic because of the thrill I get on delivering it. I could handle traffic all day and never get tired. Each message I handle I know will make someone happy. I don’t find it hard to manage the house, OM, and two harmonies while handling traffic. The family seems to understand the enjoyment I get, and I try not to operate too much when they are around. And with a dishwasher, automatic washing machine and dryer, there isn’t too much of a housework problem."

W7ONM, Marion—"I like to handle so much traffic because you meet so many nice people and you feel you are really doing your own small part in helping out. It is something that just gets you and you can’t leave it alone. I find it no harder to take care of house, husband and children. In fact, it is easier, because I find myself home all of the time."

W8ZGT, Lillian—"I get satisfaction out of seeing how quickly I can get a message from here to there. Ham radio is one of the few hobbies that can be useful to others, and I feel that by sending messages for other people I am having fun and being useful at the same time. And my belief is firm that handling traffic well can do a great deal for amateur radio."

W2RUF, Clara—W2RUF feels that she is being of value to the community. Appreciation is so profound that it more than pays for my time and trouble. I never neglect my home. My OM

Mae Burke, W3CUL, an outstanding "traffic YL."

W8ZGT, Lillian (left) and W2BTB, Jeanne, are perfectly at home behind stacks of fast-moving traffic.

(Photograph by W1APK)
(unlicensed) is very happy with his hobby because he enjoys his home and is satisfied that I am there with him most of the time."

W7ATB, Marty — W7ATB considers the question "Why do you like to handle so much traffic?" comparable to asking a DX man why he chases DX. Traffic handling is simply the phase of amateur radio that he enjoys most. Marty is not married and consequently doesn't have to take care of a house and family. Just fifteen, and a high school sophomore, she takes books into the shack and studies "between nets, or in dull periods within a net."

W8SCUL, Mae — We didn't hear from Mae herself regarding "why" and "how" she does it, but her OM, W3VR, told us that handling traffic is vital to his work. He said that she tries never to let down those who depend on her for relay and delivery, and that so long as she can handle service traffic she'll continue to devote most of her time to the work. Mae's staggering record speaks for itself.

W2BTB, Jeanne — "If you could see some of the many letters in my bulging file, if you could hear the parents of service men on the telephone calling from local and long distances, so grateful, you would understand my handling so much traffic. My real purpose is just to help the GI and his family — maybe it's because I have a son of my own. Knowing the operators and bases, knowing they depend on me for an outlet, I do not, if I am able, want to let them down."

And anyone who is acquainted with Jeanne knows how much she accomplishes in her home and community. She does manage and very capably, too.

Hats off to a remarkable group of girls!

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The YLRL Chairman of the Fourth District is probably better known by her old call, W8TAY, than by her new one, W4JCR. Anita was YLRL President and Harmonics Editor in 1942 and 1943, was 4th D.C. in '41 and '42, and Publicity Chairman for six terms. She organized the first local YLRL chapter in Cleveland and initiated ORV as the Club's motto. Currently, in addition to D.C. duties, she is chairman of the committee appointed to revise the YLRL constitution. Nita and her OM W4JCS now reside in Asheville, N. C., where she is employed as a writer for radio and TV.

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Keeping Up with the Girls

Three YL Century Certificates have been issued to date. Recipients are OMs W1BFT and W3QHI, and W3JSH, Dottle (now K2DYO), in that order. This info from certificate custodian W7GLK, Dot. . . NCS, W7BFR, Lorraine, of the newly-formed NYLON (Northwest YL Operators Net) announces a change in net time from 0300 to 0900 EST (Wed. am. 3:00 EST). VE7 YLs are invited to call in. . . When W8PJF, Rosemary, calls for the 75-meter 'phone net Wed. mornings, W6KUY, Beth (at work as a librarian) is checked in by her OM, W8YNI, who plays a tape with her message to the net. Rats then makes a tape of the net and plays it back to Beth when she returns home. . . Lastly, W5LCY, Helen, has built a home-tube receiver (505 kc. to 35 Mc.), which she claims is really "hot." . . W8JHD now has her Conditional License and has been enjoying 75 ‘phone. Lil's doctor has said that her hobby is "better than all the medicine he could ever give." . . . YLs of the Los Angeles area formed a two-meter net which meets Wed. at 7:00 p.m. on 148.1 Mc. W6LBO, Marie, is NCS . . . Because of other commitments, W8HWX and W8HUX, Lillian and Marvel, will soon have to forgo their Ham Shack County monthly news bulletins which they have edited for the past four years. . . W7QYX, Doris, maintains daily skeds with her OM, W7QYZ, who operates a commercial salmon trawler in Alaska. W7W3T, W6YRL and W6THA appeared as guests on one of W6NAZ's (Lenore) recent TV shows. Sandy and Maxine talked about traffic handling and DXing respectively. W6NZP, Evelyn, and W6LMQ, Eleanor, were guests another day and discussed their part in the 1933 All Women's Transcontinental Air Race. Audience response was enthusiastic, and Lenore urges YLs throughout the country to appear on radio and TV programs in behalf of amateur radio. . . This YLs who attended the Hills Brass Founders and Modulators Manifest at South Park, Penna., were W3s QPJ QFQ TTR TYC UTR UUG and W9MEL . . . And W6 OAK UET UNP V2D WJA YTY and W2MLT had fun at the Vermont o/c./phone plenteous on Sept. 25th. . . W8PFR, Dot, is proudly playing her new QT O'TEST. . . W4UDQ, "DB" and W4VYH, Betty, are happy about receiving their General Class license. . . YLRL Third District Chairman, W8HY, is sworn to report that W8JH has been quite ill again. Lorel says that notes and cards for Kay would be appreciated. . . Twenty-five YLs were present at the season's first meeting of the Los Angeles YLRC. Special guests were W8YNN, Shirley, and W3RFX, Delores. The membership was pleased with the new club pin (blue lettering on silver oval, suspended on blue ribbons), W9WRT, Ruby, and W6FKR, Bin., were the first YL and OM to win the club's Ladi 'N Lassie Certificates. . . We believe newly-licensed Sharon Pakinas of Bothell, Washington, still takes honors for being the youngest YL licensed. Sharon, you know, was just seven years old.

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The following contribution to the discussion of YL-XYL terminology was received entitled Hamey Report:

YL — Young lady (under 18)
LY — Lady ham (over 18)
HLII — Hitched lady ham
MIH — Mother ham
HLII — Followed by / and number indicates number of times married
MII — Followed by / and number indicates number of children

If Eleanor Wilson had letters after her name, we would know whether to use Miss or Mrs. when writing to her.

[This treatise was volunteered by OM EG4V (R. W. McCormack, San Jose) and appears unedited — W1QON, MH/1.]

Important Dates

Set aside Dec. 5th ('phone section) and Dec. 12th (c.w. section) for participation in the YLRL 14th Anniversary Party! The contest is open to all YLs, whether or not they are members of YLRL. Full details next issue.
HOMEMADE TURNS COUNTER

A simple and inexpensive turns counter that may be used with roller-type inductors is shown in Fig. 1. The assembly counts tenths of turns as well as full revolutions and can be put together for less than two dollars.

The heart of the unit is a mileage reel salvaged from an automobile speedometer. The reel is bolted to the control panel just to the rear of a rectangular viewing slot. A panel-bearing assembly, mounted below the reel, is used as a direct drive for the roller inductor and as the drive shaft for the counter. The drive shaft is coupled to the reel pulley by means of a dial belt (the type used in b.c. receivers). Tape is wound around the drive shaft to build it up to the diameter of the reel pulley. Naturally, this “build-up” is essential if the counter is to register an exact number of turns. However, the unit will give an arbitrary scale for logging purposes regardless of the drive ratio. — Raymond C. Cotton, W1BTY

RECTIFIER TUBE-SOCKET KINK

If your next power supply is to use a 5-volt rectifier tube, it will be advantageous to wire the rectifier socket with jumpers between Prongs 2 and 7, 3 and 4, and 5 and 6, respectively. Filament leads from the transformer should be connected to Prongs 2 and 8. One plate lead goes to either Prong 3 or 4 and the other plate lead goes to either 5 or 6. With these connections, it is possible to utilize without wiring changes any of the following rectifiers: 5AZ4, 5BR4Y, 5T4, 5U4G, 5V4G, 5W4, 5X4G, 5Y3G, 5Y4G, and 5Z4. — Montague R. Morey, W4YIR

METAL BEAMS AS RADIALS FOR GROUND-PLANE ANTENNAS

Those who already have a relatively wide-spaced all-metal 14-Mc. beam may also enjoy the efficient benefits of a 21-Mc. ground-plane simply by adding a 21-Mc. vertical (quarter-wave) to the system. The vertical must be insulated from the beam so that the latter may serve as the ground radials for the system.

In my case a 12-foot length of aluminum tubing is fed with a length of RG8/S/U having the shield connected to the metal beam. The set-up is 45 feet above ground and has a measured s.w.r. of 1.1 to 1. — T. J. Peery, W5MIS

ILLUMINATED CALL LIGHT

Certain substances possess a high degree of internal refraction for light, thus transmitting light from edge to edge without illuminating the major surface. However, wherever there is a surface discontinuity, light is allowed to leak out or become visible. Thus, by deliberately scratching or engraving the surface, it is possible to develop a unique soft illumination.

Fig. 2 shows a call sign that employs the light refraction property of Lucite. Engraving of the call plate is accomplished most easily by placing the plastic sheet over the lettering desired (letters cut from a magazine serve the purpose) and then carefully etching with a Vibro-tool or similar gadget. An electric drill may also be used as a router, but is more difficult to control.

To illuminate the sign, it is only necessary to mount a pair of pilot lamps, F and G of Fig. 2, in holes drilled at the bottom of the Lucite sheet.

W6KAS

Fig. 2 — Drawing of the illuminated call sign. Members marked A, B, C, D, E and F are the Lucite sheet, wooden end (2 required), line cord, metal shield and wooden base, respectively. F and G are the lamps, H is the dropping resistor, and I is internal wiring.

The lamps should be held in place with either glue or tape, and require a suitable dropping resistor if they are to be connected directly to the a.c. power line. Naturally, it would be possible to substitute a small filament transformer, mounted within the assembly, as a means of lighting the lamps.

Colored lighting may be obtained by tinting either the lamps or the edges of the engraving. Nail polish, dial-light coloring or dyes are suitable for this purpose. The etching will appear more
brilliant if the edges of the sign are treated with aluminum paint to prevent spill light around the edges of the Lucite. — John W. Sherman, W6KAS

PERMANENT IDENTIFICATION FOR COMPONENTS

Some manufacturers of chokes, transformers, etc., are continually changing part numbers and, after several years, it is possible to end up with a stock of usable parts that can no longer be identified. However, if the ratings of a component are etched on the metal case with a scribe at the time of purchase, the fact that the manufacturer changes numbers or discontinues production of that part is of no consequence. — C. Deane Kent, W2JFA

CONVERTING THE GONSEN TRI-BAND TO 40 METERS

Your Tri-band converter need not be made obsolete by the opening of the 40-meter 'phone band if you are willing to invest a few hours in minor modifications.

The high-frequency oscillator covers two ranges: 5000 to 5150 kc. for 75 meters and 7300 to 9200 kc. for 20 and 10 meters. The second and third harmonics of the 7.5- to 9.2-Mc. range are used to provide the 1440-ke. i.f. frequency at 20 and 10 meters, respectively. This range can also be used on its fundamental frequency to provide an i.f. for 40-meter operation. The only change necessary, therefore, is to tune the grid circuit of the r.f. amplifier to 40 instead of 20 meters.

Various methods have been considered but the simplest appears to be the addition of an inductance in series with the 20-meter r.f. amplifier coil. For normal 20-meter operation, the added inductance is shorted out with a low-capacity switch. With this system the antenna is overcoupled at 40 meters. However, operation is satisfactory and only a very simple switching circuit is necessary. The modifications are shown in Fig. 3. The steps involved in the modification may be enumerated as follows:

1) Remove the high-frequency oscillator trimmer capacitor from its front mounting bracket. This position will be used for the 20-40 bandswitch. Drill a ½-inch hole in the rear panel, topside and midway between the G6HIS and G6C4 tubes and about 1 inch above the chassis. The trimmer is mounted in this hole and heavy solid copper wire soldered between its stator terminal and the stator of the main oscillator tuning capacitor.

2) The hole in the bracket where the oscillator trimmer was located is enlarged to ½ inch. A low-capacity a.s.p.t. switch, S1 of Fig. 5, is installed in this position. I used a file-down version of a tone control switch to fit into the limited space.

3) The ground on the 20-meter r.f. coil must be lifted. This is most easily accomplished by removing the screw through the grounding bracket nearest the center of the chassis, bending the bracket up, and replacing the screw to hold the components in place under the chassis. Insulating material or paper may be used to keep the bracket isolated from ground. The 20-meter coil will be held rigidly in position with the one remaining grounding bracket.

4) The new coil, L1 in Fig. 3, consists of approximately 25 turns of No. 28 enamelled wire wound on a ½ by 9½-inch powdered iron core form. An adjustment of the number of turns will be necessary if an air core is employed or because of variations in permeabilities of iron cores. Don't forget to have the antenna connected when resonating the circuit. L1 is soldered between the grounded and floating brackets of the 20-meter r.f. coil.

5) One contact of S1 is wired to the floating bracket on the 20-meter coil while the pole of the switch is soldered to ground via a ground lug installed near the switch bracket.

Fig. 3 — Circuit diagram showing the modification which permits 40-meter operation with the Tri-band converter. W3HTF describes the conversion and the new components in the accompanying text.

With the bandswitch set to 20 meters and S1 in the open position, the 40-meter band will appear between 60 and 90 on the white scale when the pointer is close to vertical. — H. Lukoff, W3HTF

The Gonesen Tri-band converter used here at W4DNB was quickly modified for 40-meter 'phone operation by inserting a coil in series with the 20-meter r.f. amplifier coil. The new inductor consists of 36 turns of No. 24 enamelled wire wound on a ½-inch diameter polystyrene form. A s.p.s.t. switch is used to cut the new coil in and out of the circuit. — Elder T. Holbrook, W4DNB-W4YTN

Editor's Note: When installing the coil recommended by W4DNB, remember to lift the ground referred to in the description of W3HTF's modification.

The Gonesen Tri-band can be easily converted for 40-meter 'phone operation by adding a d.p.d.t. switch and a 100-µfd. variable padder to the original circuit. One section of the switch is used to disconnect the 180-µfd. padder that is normally tied across the 75-meter r.f. coil and the other half of the switch is used to connect the 100-µfd. capacitor across the oscillator coil. The new components may be mounted on the back plate of the converter.

After modification, the Tri-band is set up for 40 meters by rotating the regular bandswitch to the 75-meter position and by throwing the d.p.d.t. switch to the position which does the jobs outlined above. Of course, the 100-µfd. oscillator padder must be adjusted for maximum converter output at the proper i.f. frequency.

When the converter is operated at 40 meters, it draws more plate current than it does when tuned to any of the bands for which it was originally intended and it is therefore advisable to check the plate voltage after the conversion has been made. Make certain that at least 100 volts is applied to the unit. — Grover Hunsicker, W5BDE

52
S-METER CIRCUIT FOR BOTH A.M. AND S.S.B. SIGNALS

Few amateur-type receivers provide for use of the S-meter when the set is tuned to an s.s.b. signal. Fortunately, this deficiency can usually be easily overcome by switching the indicator over to the audio circuit during s.s.b. reception.

Fig. 1 — Circuit diagram for the a.m.-s.s.b. S-meter.

R₁ — 1000 to 2000 ohms; see text.
R₂ — 2500-ohm potentiometer.
CR₁ — Instrument rectifier.
M — Original S-meter.
S₁ — D.p.d.t. toggle switch.
T₁ — Receiver transformer.

Fig. 4 shows how the arrangement has been applied to a National type NC-183D receiver.

In the modified circuit, the S-meter terminals are connected to the center arms of a d.p.d.t. toggle switch, S₁. When the new control is set to the "r.f." position, it ties the meter back into the original indicator circuit. When the switch is flipped to the "a.f." position, it connects the meter to the output terminals of an instrument-type full-wave copper-oxide rectifier. The input side of the rectifier is connected in series with a calibarion potentiometer, R₂, and the secondary of the output transformer, T₁. Naturally, the speaker-transformer connections do not have to be disturbed when the modification is being made.

If the receiver on hand does not employ a shunt across the S-meter, it will be necessary to add R₁ of Fig. 4 to the original indicator circuit. This resistor prevents the a.m.-indicator circuit from opening up whenever the meter is switched over to the s.s.b. position.

A calibration for the s.s.b. S-meter can be made most easily by comparing its readings with those obtained on a general-purpose test meter. Most of the latter have scales that are directly calibrated in terms of decibels. — Wayne W. Cooper, W1NWC/W6BWC

MOBILE C.W. RECEPTION WITH THREE COMPONENTS

The usual method of adding a b.f.o. to the second detector of an auto receiver ordinarily involves quite a bit of effort and requires an additional tube. In most cases the receiver is so compact that the b.f.o. must be outrigged.

One method of obtaining b.f.o. action is to allow an i.f. stage to oscillate and beat with the i.f. signal. Usual means of introducing oscillation include adding capacitive coupling between plate and grid of the i.f. tube, or providing another winding on the i.f. transformer for feed-back. Either scheme is messy and usually results in considerable detuning and critical wiring.

A simple modification avoiding most of the difficulties and using only three components is shown in Fig. 5.

The screen lead is opened and a 2.5-mh. choke inserted. The screen is thus part of the oscillating circuit. Regeneration is controlled by the 0.25-megohm potentiometer which effectively determines the amount of by-passing at the screen. The values of the components are not critical, and will work with any i.f. frequency. In this particular case, 285 kc. was the i.f. frequency. The components were installed about 5 inches from the tube socket without noticeable effects. Normal 'phone operation is permitted by turning the potentiometer to zero resistance. At this point the i.f. stage acts exactly as it did prior to the conversion. C.w. is received by turning the potentiometer to a point somewhat after a "plop" is heard.

Grounding the a.v.c. line with a switch is absolutely essential. This had already been installed in the receiver when it was found that it resulted in considerable improvement in 'phone reception.

Fig. 5 — I.f. amplifier circuit that permits c.w. reception with a converter-broadcast receiver combination.

C₁ — 0.05 μf.
R₁ — 0.25-megohm potentiometer.
RFC₁ — 2.5-mh. r.f. choke.
S₁ — See text.

Note: All other components are original circuit parts.

The a.v.c. voltage had apparently reduced the receiver sensitivity by responding to the high average noise level, rather than the weak signal. The a.v.c. is normally grounded on all but the strongest 'phone signals. I use a 3-position switch with the following positions: Off, noise limiter on, noise limitor on and a.v.c. grounded. As an alternative, the a.v.c. ground switch could, of course, be mounted on the regeneration control. The beat frequency is fairly stable, and therefore voltage regulation is not necessary. Only a slightly noticeable change of frequency occurs as the engine progresses from idle to race.

Quite a number of auto radios have gain controls that can be manipulated to advantage. In my case (1951 Ford) the cathode resistor of the i.f. amplifier is a small screwdriver adjustable potentiometer to which I added a shaft and knob. The extra gain achieved by turning the potentiometer up is very noticeable with weak signals. If the gain control potentiometer is turned too far down, the i.f. amplifier may refuse to oscillate and function as a b.f.o. — H. Lukoff, WSBTF

(Continued on page 139)

November 1953 53
A.R.R.L. QSL BUREAU

The function of the A.R.R.L. QSL Bureau is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K, and VE call area. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4 1/4 by 9 1/2 inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner. For a list of overseas bureaus see p. 59, June, 1953, QST. (Bold-face type indicates change since last QST listing.)

W1, K1 — J. R. Baker, Jr., W1JOJ, Box 232, Ipswich, Mass.
W2, K2 — H. W. Yahnelt, W2SN, Lake Ave., Helmetta, N. J.
W3, K3 — Jesse Bieberman, W3KTE, Box 34, Philadelphia 5, Penna.
W4, K4 — Thomas M. Moss, WHHYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — Orion B. Gambill, W5WI, 2514 N. Garrison, Tulsa 6, Okla.
W6, K6 — Horace R. Greer, W6TI, 414 Falmount St., Oakland, Calif.
W7, K7 — Mary Ann Tatro, W7FWR, 518 N. Central, Olympia, Wash.
W8, K8 — Walter E. Musgrave, W8NGW, 1294 E. 188th St., Cleveland 10, Ohio.
W9, K9 — John F. Schneider, WOCFT, 311 W. Ross Ave., Wausau, Wis.
W9, K9 — Alva A. Smith, W9DMA, 238 East Main St., Caledonia, Minn.
VE1 — L. J. Feder, VE1FQ, 125 Henry St., Halifax, N. S.
VE2 — Austin A. Smith, VE2UUW, 614 Jeanne Mance, Montreal 8, Que.
VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
VE4 — Len Cuff, VE4LC, 386 Rutland St., St. James, Man.
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 1330 Mitchell St., Victoria, B. C.
VE8 — W. L. Geary, VE8AV, Box 534, Whitehorse, Y. T.
VO — Ernest Ash, VO1A, P.O. Box 8, St. John's, Newfoundland.
KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
K16 — Andy E. Fuchsham, K16GA, 254 Nanao Dr., Honolulu, T. H.
KT7 — Box 73, Douglas, Alaska.

Answer to QST QUIZ on page 16

"Seems to Us . . . ."
(Continued from page 0)

perfectly plain where the fault lies. A copy of the letter is published in our "Happenings" column this month; additional letters were also addressed some 40 individual equipment manufacturers. While only a few manufacturers employ the channel strip conversion system, some of them are among the industry's largest producers.

We expect to have more data on this problem in future issues of QST, as soon as current lab and field tests are completed.

54 QST
Reader Joseph Sapienza finds tubular Twin-Lead just the thing for antenna-to-shack intercommunication. No auxiliary gear necessary—just talk into it.

W9AOD thinks many constructors may be overlooking a source of simple chassis in the tremendous assortments of inexpensive aluminum metalware available at most department stores.

Lloyd Roberts, W8ANI, of Minneapolis, in the first such amateur instance brought to our attention, is now catching up on the twenty-seven months of QST he missed while being held as a prisoner of war in Korea.

Possible menu musts for next Field Day: W9MVJ sends the label from a can of “Sea-Q” salmon and W4NZY calls our attention to the recent “I Am Cook Book” issue of Good Housekeeping magazine.

W8HDF had successive QSOs with W7HDF/3 and W3HDF on September 3rd. Noting that the names of both operators were identical, W8HDF ascertained that W7HDF/3 had received his new W3HDF ticket between contacts.

Society Radio Operators of Chicago, to celebrate acquisition of new quarters in the Billy Caldwell Post No. 806, American Legion, 6038 N. Cicero Ave., announces an Open House to be held on the night of November 11th. A talk on binaural “3-D” sound will be featured.

Twenty-eight amateurs serve on the staff of Allied Radio Corporation, Chicago. With an area equivalent to 1½ midwestern city blocks, Allied’s new quarters have 1500 feet of five-layer conveyor belts, 7200 feet of pneumatic tubes, a cafeteria, 150-car parking space and a telephone system equal to that of a fair-sized town.

Relatively little information now exists as to ionospheric phenomena at frequencies below one megacycle. Until recently, propagation research on these frequencies lagged far behind that performed on higher ranges. Since 1950, however, when the National Bureau of Standards successfully obtained vertical-incidence reflections at 37 kc, NBS has engaged in a program further to evaluate low-frequency phenomena. Records obtained thus far in this work show a diurnal variation with reflections from the ionospheric $E$ region apparent at about 100 kilometers above the test transmitter.

From the Fitchburg, Mass., Sentinel via WBNO, concerning audiometer hearing tests given 3000 local school children: “[The audiometer] is an electrical device with headset connections. Decibels, units used for measuring loudness of sound, are transmitted through the 'phones.”

The Sixth Annual Conference on Electronics and Nucleonics in Medicine, to be held at the Hotel New Yorker, New York City, November 19th–20th, will feature symposiums on such subjects as diagnostic devices, X-ray techniques, cineradiography and uses of the analogue computer in biological research. This year’s session is jointly sponsored by the American Institute of Electrical Engineers, the Institute of Radio Engineers and the American Instrument Society.

The many friends and on-the-air acquaintances of Earl Mead, W7LCM, who won wide acclaim for his wit and courage as “Da Mayor” of Huntley, Montana, will be saddened to learn of his sudden passing in late September. W7LCM had been an invalid for the past 16 years as the result of an automobile accident. Earl’s silent key will leave a void on his favorite amateur bands, for his log contained an estimated 18,000 QSOs. W7LCM’s business as a magazine subscription representative will be carried on by his wife.

The Edison Radio Amateur Award Trophy, displayed at the 1953 ARRL National Convention in Houston, is inspected by (l. to r.) FCC Commissioner George E. Sterling, W3DF, one of the four judges for the Award; General Electric Co. official C. A. Bradford; and ARRL President Goodwin L. Donelan, W9PSN, also an Award judge. Awarded annually for outstanding public service, its 1953 winner will be announced on Feb. 11, 1954.
S.B.

1214 Greenfield Dr.
Clarksville, Tenn.

Editor, QST:

... QST is aware of the fact that many do not know or will not admit that s.s.b. is 'phone. They are aware that many do not realize that s.s.b. is only half as wide in spectrum as old-fashioned d.a.b., that it is far more efficient, much less expensive and (got this) simple.

The only thing I have ever noticed QST trying to ‘jam down the throats’ of us ordinary citizens is to be more democratic sort of fellows. Should the editors ever stop this sort of ‘jamming’ it would cause QST to become the organ of the ever-decreasing number of amateurs who think because they have an old-fashioned ‘phone rig that is powerful enough to make them ‘the king of the roost’ and little 50-watt s.s.b. stations are usurping them, that the entire art should stop all forward motion so they can sit back on a button and say into the mike, ‘I am a BIG man.’...

-- Connie L., "Stim" Wilson, W4VQT

QRM CUTTER

1205 West Main
Dothan, Ala.

Editor, QST:

Just thought I would drop a note of appreciation for the fine work done on the articles in the 1953 Handbook. I just got my ticket a few weeks ago, and have been having trouble (like most everyone else) fighting the QRM on the 80-meter Novice band; however, since I had the parts listed stored in one junk box or another, I decided to build the dipper/lotter on Page 112. After about three hours’ work, I took it over and plugged it into the output of my BC-454. I was expecting some improvement, but nothing like this! It sure cut out the QRM and static crashes like a knife. It has doubled the pleasure of operating, when I want to go up in disgust until I could get a new receiver; now, I am burning a hole in 3725 and 3727 with my QSOs.

Also, I would like to echo what has been said over and over about the W1AW code practice. It was one of the big factors in helping me get my ticket; however, was it that so many operate zero-beat with W1AW during the sessions? When one is trying to learn code, that looks like the most crowded part of the band.

Again, my thanks for the fine job well done.

-- Douglas Larue, W4JRE/W4JRE

SEE?

706 Francis Drive
Wantaug, L. L., N. Y.

Editor, QST:

I don’t think you realize the valuable service of your pictures of the tremendous antenna arrays some hams manage to get up. I doubt if there are many of us who miss the change to show them to the XYL and remark, “So you think my antenna is big!”

-- C. J. Heaney, jr., W2CEP

PULLING POWER

527 Fifth Ave.
New York 17, N. Y.

Editor, QST:

In the July QST I ran a small classified ad offering a Harvey Wells TRS80-D for sale—the first ad I had ever run in some 23 years of reading your good magazine.

Frankly, I was amazed at the response. Ten fellows either wrote or called me with definite offers to buy it, and I heard from several old friends I used to know back in the early ’30s when I was a W2.

Just thought you’d like to know again that QST classified ads really pull their weight. The response was particularly interesting to me as one who has spent some 15 years in the advertising and selling business.

-- Stuart D. Cowan, jr., W1RST

"BLIND TRANSMISSIONS"

Box 374
Hugo, Colorado

Editor, QST:

This letter represents my first effort to publicize my views on a pet peeve—hams who send "blind" without listening on the frequency before each transmission. I have continually hearing grumbles about QRM on the bands, but few seemed to realize that this is caused to a considerable extent by the above-mentioned trouble. It is thoroughly disgusting to have a DX QSO fouled up with a local CQ right on top of your signal. I don't like to be presumptuous, but I think it is high time that every self-respecting amateur got rid of this ungentlemanly habit.

-- Donnie Johnson, W9QNLD

1420 Elder Ave.
Boulder, Colo.

Editor, QST:

On a Sunday afternoon last month, I was trying out a new rig and new antenna coupler on twenty meters. Following my usual custom in testing, I checked with receiver and panoramic adapter, and chose a spot of minimum activity within 20 or 30 kc. of the frequency on which I intended to operate. I found the antenna difficult to load, and had a carrier on for a couple of minutes, then signed my call as customary, and as required by the FCC. Immediately a station on the frequency called, without naming his own call, and launched into a tirade about not listening before testing. He evidently lacked the intestinal fortitude to let me know who he was. I informed him that I did listen, that I knew of no way to load an antenna without feeding power to it, and further that he had no exclusive right to the use of his frequency. He did not return, so I listened on the frequency for a minute or so. Presently a W6 with a three letter call, all letters late in the alphabet, resumed a "rag chaw" with a W9.

This surely reaches a new high point in unmitigated gall — "I am on the air — everybody else get off my exclusive frequency — how dare anyone interfere with my conversation?"

Ham radio is the wrong hobby for this individual. If he can’t take the QRM along with the rest of us, without rudely trying to berate someone for daring to interfere with his important rag-chewing, he should take up stamp collecting. It would be easier on his nerves and temper...

-- Eugene M. Luke, W0LI

GHOSTS

18 County Way
Greenburn, Mass.

Editor, QST:

I am employed by the New England Tel. & Tel. Co., at their ship-to-shore radiotelephone station WOU, Green Harbor, Mass. One of our receiving frequencies is 2110 kc., and you would expect that we would never hear an amateur on it. Unfortunately we do. This results in almost a VFO, and happens when someone is just getting on the band. As near as I can figure it out, it results from the receiver picking up a so-called ghost signal.

As an example, suppose that little Willie fires his receiver up on a frequency of 1892.5 kc. and zeroes in on the VFO
there, so he thinks. The following has happened several times while I have been on watch. WOU hears him calling CQ or test on 2110 kc.

Dial on Willie's r.evv. reads 1882.5 kc. VFO actually on 2110. The receiver Lf. is 155.0 3
The h.f. oscillator is 3165.7 2nd harmonic 4290

The 2nd harmonic of receiver oscillator is 4675
Subtract VFO 2nd harmonic 4220

Ghost signal of the h.f. results — 455

As the FCO monitors the ship telephone frequencies due to our complaints of other QRM, a nice pink ticket can result. When I can identify the station and can find his call in the Call Book, and the hams has a telephone, I attempt to call him and advise him of the trouble.

— George W. Brooks, W1JNO

CODE COPYING

14 Gerdes Ave., West Orange, N. J., Editor, QST:

A. Harvey Fletcher's book on sound mentions briefly that pitch can be recognized by the human ear only if the sound has a duration of 0.05 to 0.09 second or more. This corresponds to a code speed of approximately 30 w.p.m. At 60-70 w.p.m. a single dash would lose pitch, but several consecutive dashes would probably make the pitch recognizable. The usual threshold for a dot will be somewhere below 0.05 second, but I have not been able to find a textbook on sound or psychology that establishes that threshold. Measurements must have been taken to find human endpoints for dots, dashes, spaces, and word groups—probably during the time preceding high-speed commercial recording. Have you run into some of those references? What level of random noise effects intelligibility in e.w. reception? I think you have mentioned in one of your articles that as code speed is reduced, the signal-to-noise ratio for the threshold of usefulness will decrease.

With International Morse near 100 w.p.m., the spaces between the words are lost to me. Increasing the gap between words might make recognition of the word groups possible at higher character speeds, but an endpoint in word-gap-speed ratios would also be reached. There must be a region, also, where the ear integrates the square-wave e.w. signal into a modulated sine response.

There are several interesting relationships here.

— Mark Segholt, W2RYI

OKAY, OM

Syracuse, Indiana, Editor, QST:

It is beginning to be a little silly. What's in a name, anyway? This has happened at least a dozen times on the start of a QSO on e.w. — "RRR [meaning solid, of course] but missed your name."

Brother, you didn't miss anything — I didn't give it! Let's use OM once more!

— M. K. Meredith, W9QYII

WHAT'S IT BE?

Tinker Hill Rd., Pine Plains, N. Y., Editor, QST:

If there were anything that could induce me to side with advocates of a reduction of power permitted on the ham bands, it would be those high-power gentlemen (and I can name names and calls) who long ago got WAC and DXCC and never let go, nightly, settle down in the first 10 kc. of the 30- and 40-meter bands to rag-chew (usually about the QRM), while hundreds of other guys and gals strain and sweat and swear, trying to complete a QSO with a crystal-controlled 50-watt in Denmark or Australia.

Just last night I heard W2—tell W1—that "If we running about 800 watts." Those two stations were less than 150 miles apart and they were on 7008 kc. They could have communicated perfectly with 30 watts — or even 10. The FCC regulations say they should have been using exactly that power — the minimum necessary.

My own feeling is that we could all live and let live — the fortunate few who own a kilowatt should be allowed to enjoy them. But, by the same standard, the big boys ought to allow me and my 80 watts to live. If they don't, I think the FCC ought to suspend the licenses of a few of them for violating the rule about minimum power.

— Fred Myers, W2ITT

HAM RIGHTS

1507 Central Avenue Kansas City 2, Kans., Editor, QST:

There may be times when net operators may be too quick and eager to ask non-net amateurs to QSY, or even to "tell" them to do so. However, there is much more to be said on the other side of the question.

A net is a group of stations. The very nature of a net requires that it meet at a certain time on a certain frequency, and those dependent on factors such as the convenience and availability of all members, propagation conditions, and connecting net schedules. Unlike the usual operator, a net cannot easily QSY, QRX or QRT.

The members spend the biggest part of their time standing by and listening; therefore, a net takes up less frequency space than if the members paired off for individual QSOs. If for no other reason — the non-netter should respect net operation because it reduces over-all band QRM.

If there is a question of "manners" involved, what of the manners of an individual who considers his individual "rigius" above that of a large group. In most cases if the offending amateur had had the good manners to listen on the net frequency before he "opened up" with his CQ, "dog whistling," or sending test signals with his left foot, he would have known that he would be interfering with the rights of others.

Amateurs need to "mind their manners" and also to use some good old fashioned common sense and realize that when one gets "rigius" that one also assumes responsibilities.

— Merton T. Meade, W9KXL

November 1953

SWITCH TO SAFETY!
The on-the-air appearance of CE9AA, installed and operated on Easter Island during the month of August by Luis M. Desmaras, CE3AG, must be recorded as one of the year's outstanding amateur radio events. CE9AA's ham-band signals were the first such to shatter the normal tranquility of the ether surrounding Rapa Nui, as Easter's several hundred natives call the island. Here, indeed, was a golden opportunity to cross an enigmatic blank off one's DXCC Countries List!

CE3AG's trials and tribulations in preparing and consummating this operation can easily be understood. The sea voyage in itself, a round trip of over 4000 miles, was an undertaking of no mean magnitude. Transport Angamos, bearing Luis and his gear, encountered such storms en route that lists of up to 38 degrees were recorded. The ship left Valparaiso July 21st, touched at Juan Fernandez Isle on the 26th and reached its destination on August 7th.

Surmounting another series of obstacles in debarkation, CE9AA at last was readied for action on the 7th in time to start the ball rolling with CE3AB on 14-Mc. 'phone—a "first" among firsts to come. A contact with CE3AG (CE3DG operating) followed, during which Luis chatted with his anxious family. Then the fireworks really began, for word of CE9AA's availability had spread like a chain reaction and each passing moment brought more and more stations on the air in pursuit of Easter Island.

Below, left, Luis takes a moment to pose near one of the many curious and ancient statues that dot Easter Island to the bewilderment of archaeologists. Right, the shack of CE9AA. One end of the antenna is visible at upper left.

CE3AG deftly handles a king-sized pile-up at the CE9AA operating position. Among equipment used: a Collins 32V-2, 75A-2, a 500-watt gasoline generator and an off-center-fed multiband antenna. Luis brought his favorite junk box along, too, and it came in handy!

W6GDJ was the first U.S. amateur to enter the CE9AA log (e.w.) and W1FH was the first lucky W 'phone. Eight days later, when Luis closed down after 73½ hours of on-the-air time, CE9AA had recorded 1538 QSOs with 53 countries on all continents—1103 on e.w. and 375 on 'phone. During this week-long period of operation Luis found conditions generally quite good on 3.5, 7, 14 and 21 Mc., the four bands used. On each band, respectively, CE9AA worked 46, 202, 1256 and 34 stations.

Luis worked the U.S.A. 206 times, Argentina 108, Chile 97, England 68, New Zealand 36, Brazil 26 and Canada 22 times. CE9AA, averaging well over 20 QSOs per hour of total operation, had a peak hour that brought joy to 61 eager beavers (60 Ws and one KH6). W3OP made it just under the wire; his was the last W contact.

The return trip home began on August 15th and Luis, operating as CE9AA/MM aboard the Angamos, ran up some 200 additional QSOs before arriving Valparaiso on the 25th, thirty-two days after the DXpedition had set forth.

For CE3AG the affair was his greatest radio thrill since scoring WAG as ae2LD in 1925 with a UV-202 Hartley transmitter. For hundreds of rabid DXers the working of Easter Island from their end was perhaps as great a thrill.

Luis, of course, extends his thanks to all who gave encouragement and assistance toward making CE9AA plans become reality. On behalf of the DX world, our heartiest gracias to CE9AG!
CONDUCTED BY ROD NEWKIRK.* WIVWV

How:

In a fashion, our 160-meter band comes very close to filling description as the “oldest amateur band.” Certainly it isn’t far distant from the near-200-meter wavelengths that saw the birth of amateur radio around a half century ago. And, although it came into official being along with to amateurs. What with its belated availability, one-sixty was relegated to the sidelines. But, as the postwar sunspot maximum and DX boom began to wane, many DXers, faced with spotty high-frequency conditions and also in need of more DX worlds to conquer, began to give 160 a serious try.

Stewart S. Perry, W1BB, who had been keeping an enthusiastic eye on the 1.8-Mc. range for quite some time, set his own sights for more and better 160-meter DX. Stew began hitting the jackpot with several firsts as previously recorded on these pages. The climactic one of all became fact recently when W1BB received an eagerly awaited QSL from New Zealand. Yes, after all these years somebody has finally confirmed the heretofore “impossible” — a 160-meter WAC. W1BB is the guy!

How many countries and continents can you work on 160 meters this season? See you there.

What:

Twenty e.c.'s. have been achieving a little better in the daytime — and even more blotto at night. Notwithstanding, W0H2UZ 2ped his power to 300 watts and made out all right with this assortment: CN2AO (14, 016), CR4 4AJ (038), 6CS (076), CTZBO (913), DU7SV (062), E4SR 6AF (080), 9AP (034), EL2A (016), FK49O (050), F08s AB (048), AC (048), AI (058), H11A (038), HZ11H (029), KX6BF (089), LZ1KPZ (070), MDSRM (095), MP45BD (013), OD8s BK (029), LR (100), QQ8s GU (062), NK (062), VN (070), SU1s GO (040), SS (035), Z0 (016), VK9s RM (050), WL (025), YQ (024), VP2 MD (005), 2V (032), VO4AQ (072), YS1s DF (095), DF (065), FE (065), FF (155), GA (076), VS2DF (065), YL2AM (061), YMMCD (095), W5Z0J/XKJ (042), ZDB (124), ZD4BN (042), ZESV (074), ZF0s 1AB (005), 2AA (098), ZF3 5AY (095), 6CR (045), 4X4s BX (018), DE (048).

W1BB's 160-meter “royal flush plus one.”

sister harmonic wavelengths down the line, one-sixty is the first ham band you'll trip across when contemplating the traditional amateur panorama of “200 Meters and Down.”

Activity reached a dizzy peak on one-sixty just before WW-II when it became the heavy favorite for short-haul 'phone work. At that time an amazingly high percentage of all amateur activity took place on this buzzing band. During that period, a sunspot maximum, 160's DX potentialities lay unexplored with the exception of limited experimental tests. Indeed, its reputation as a “local” band became so firmly entrenched that a typical expression of the height of impossibility in those days was to the effect that “Joe Blow needs only five more continents for his 160-meter WAC,” followed by derisive laughter.

After the war ten meters took over as No. 1 cross-town band, being one of the first reopened

*DX Editor, QST.
Karl Ramser, H1B1J, regularly takes advantage of opportunities to operate in Liechtenstein as H1B1J. He is a Collins 32J1 and 7A1-A which are used with a 3-element beam and long wires at a mountain location some 3000 feet high.

too numerous to mention.... The path between Hawaii and Europe is always a toughie. To date CT1EX is HKEW's only European 'phone contact.... CRSSP (195), MIB (170), M9Ps AB (120), KAC, QOSDZ (170), SUIMR (130), V5A (200), Z2KA (184) and Z2AM (196) are gaudy ones accounted for by listener L. Mark Michel of Pennsylvania.... ZC6UNJ prefers to invoke the element of surprise rather than use the overworked Q5 system--likes to pick out a weak W calling QSO and raise him on his frequency. These Ws generally keep pushing good 14-Mc. 'phone signals into Jerusalem through stupendous European AS QRMs: W10S, W29 JT KLI, W3s IXJ QM KDD HR WUH, W6GZ, W6s AV and GMB ........ HRI's UM (152), TL (125), EK3H0 (144), Y4s AA (167) and AI (279) contacted W9LMC.... W5DXC stawards have been concentrating on 'phones CR6CL (190), FF5AP (190), F5OA (190), F5OSL (190), HZ1AT (220), J2LUX (190), Z5SA (190), ST5ZV (190) and V5SCL (250).... Forty holds few secrets from W5WQZ. Dave reached 33 7-Mc. countries recently by way of folk like H12OT (7100), HR1KE (50), J1As AO (25), CR (25), KG4A (30), K5A4E (95), K5O6B (50), L72S (50), M2P2N (25), V5SN (20), V57S (50) and several 28s. Natives-type 1X Q5As have arrived from W6es ATW, W7A4P and W5M9P.... W9KEJ took word on JAs AI CH, KG6F8A (48), K5D6D (13), T2PZP (30), V5PNY (140), VRZCO (120) and a longhaul 28 ....... L4Z0, S2PO, K5KAD, ZK1AB and CBA6A are back to W4Q9's new 'tooter. With the old 25-watt rig Howy succeeded in working over 100 countries on each of the 3.5-7, 14- and 28-Mc. bands. No VFO or beams were employed in the process.... W6LW and W6NTR mention F6GRN (53) of Blak, Netherland New Guinea, a possible competitor for JZ8KF. The latter could be ex-P79X of early N.W. fame.... W1APA and W4TJ1 worked VK1RL (50) of Macquarie Is. W4TJ1 also reports good fortunes with ZUSO (40), V5PBH (68) and many Oceanica stations.... SHAVE, Hq, station F5S1P, O4AC, T2ECR, K06WT and V9PR are also in V5SQQ's listing.... W1APU, W2TKG, W2OUL, W4UA, W4ZGC, W5BIL, W2ZZ and W5PRM are getting in on their share of 7-Mc. DX ....... F5OSX (37) and VR2AS (24) were nabbed by W9LUX.... The real DX season on eighty has just gotten under way but W4ZAE's Transcontinental DX Club8uddies have al-

Jack Wheeler, W7INX, operates F08AI aboard his ketch Gemini while he and his family cruise Pacific waters. Unfortunately for DXCC enthusiasts, FO8AI apparently engages in no land-based amateur activity. Jack's dad in Portland was a ham himself back in spark days. (Photo courtesy Lawrence Barber, Marine Editor, Portland Oregonian)
ready recorded FTSAR (3505), QO 60 VN (07), AQ (16), VQs 3RIFF (23), 4RF (11), VSIAU (01) and ZD2MEQ (44). ... W600J tells of an interesting 3.5-Mc., three-way contact with K9BVA, the latter coming right through with a mere five watts. ... We'll be interested in seventy-five phone DX doing this season so please tell us concerning your good luck on the band.

On 27 November, W2PRM tells us that he's reached the 53-country mark. VQ 4RF has the outstanding 21-Mc. signal in Saarland. A triplex stage running 50 watts is ample enough to get 9SJ4X plenty of business on this band. W2PRM further learned that L2Z3AB QSL'd to ZK5CP and HB0EU on 15 meters, the only Bulgarian 21-Mc. activity to date. ... HCF1S (21, 222), QV2HA (140-200) and ZPIDC (275) are reported by W1WPR of W1AW, all three on phone. ... W600J reached 47 21-Mc. bearings via W2NA. Recent A3 contacts for Miles: CE1BE, HP5FJ, KHS's AR NS, KP4TA, KV4BT, KZ25F and GD ML MJ NM SA, PDA OS 88, T8LA, VKA 129GGW and a 256. JAI1DN was raised by W60Z on c.w. ... Folded dipole and a 25-watt 807 final modulated by a Heising 6L6 stage got CTQ1P, HPIPE, KX4AJ, PDS 5X6 S6 6WR, PDA2AA, X563B and ZP5FJ for W1GMP. You can really get some QRP results on fifteen these days. ... Writes W600J, "I notice the Novices are really invading 21-Mc. now. ... The more activity, the better!"

The one sixty gang are rolling up their sleeves early. A group of W stations will be looking for 160-meter DX stations with Thursday and Sunday morning runs from 0600 to 0700 GCT and W3RQG desires to receive reports from other stations who join the watch. ... W1BB informs us that plans for the annual 160-meter Transatlantics are shaping up -- we'll pass along the details.

Don't look now, but we've received two ten-meter reports this month. W4ZAE and the TCXDC group secured up CT1YD (28,356), CBX4E (88), HClMB (490) and a bunch of LUs, while V5DBCT reports whopping signals from LUs. With very few interesting exceptions, 10-meter work for W/VE's is strictly a north-south proposition nowadays. Let's hope it won't be long before 28-Mc. rotaries again become available.

Where:

From ZC4IP via W9DUDY: All QSLs for ZC4 stations may be sent to Mrs. Barrett, Box 219, Linnaeus, Cypress, Texas. She's ZC4IP's XYL. ... Regarding Bulgaria-bound pasteheders, this address has worked for L2Z3AB in the past and should be sent with all applications. It's possible that ex-PK7SM could help out with your PK5VK QSL problems, too. Don't forget that full QSL data are required.

CNS8N, Lt. T. E. Heiderman (W5UFQ), AO-1907848, 735th AC&W Sqdn., 1st Postmaster, APO 117, New York, N. Y.
GR6CK, P. O. Box 184, Marangie, Angola
CRLZLA, Box 5148, Po Box 5148, Buzios, Angola
ex-FB5BB, Mac Loust, 8 rue d'Ulm, Paris, France
FOFAB, (QSL via EIC)
FOW5L, (QSL to W7FNF)
FO6Q, P. O. Box 27, Brantville, Fr. Equatorial Africa
HBIAG/LD, Dr. Erwin Huber (HBIAU), Schaef Fl, Box 95, Liechtenstein
JASTA, Shigeo Okaya, Box 1042, Kobe, Japan
JAZ3B, Seishu Hamada 26, 5 Nagura-cho, Nagatoshi, Kobe, Japan
K27EE, U. S. Naval Radio Facility (3B), Navy Bldg 600, Box 14, PPO1, San Francisco, Calif.
K30BA, APO 105, % Postmaster, San Francisco, Calif.
K7TDX, C. W. Cleveland, American Legion (VOS), Tangier Zone 01XXX, (QSL via O81AH)
OK1MB, B. K. Micka, Utkruti 8, Praha X1V, Czechoslovakia
OQ8YN, J. Van Nier, % Telecommunications, Stanleyville, Belgian Congo
P72A, Juan Ramos Bocarrat, rau Guaba 103, Santos, Brazil
ex-SU1AD, (KE2KJ1) and Stratford Fl., Babylon, L. I. L., N. Y.
SU1XZ/MD5, (QSL via KS0B)
V2PDL, P. O. Box 105, Dominica, Windward Islands, B. W. L.
ex-VEPSB, (QSL via VE2UW)
VE2BA, H. B. Allanson, P. O. Box 81, Kiwra, Northern Rhodesia
VQ3RBA, Box 107, Moshi, Tanzania
VEQ4HP, Box 71, Kismu, Kenya
VRAE, (QSL via K5B2Z)
ex-WWMY/CR, (QSL to K9AYK)
W7B/EK5P, Lawrence Benjamin, 2204 NE 7th Ave., Portland, Ore.
XZ6NY, A. Vaguerro, P. O. Box 147, Monterey, N. L., Mexico
YV1PRI, Tina Pupovic, Barnet, Nova-Selos, Yugoslavia
Z92Z, (QSL via HS0C)
ZD4BN, (QSL via RS9B)
Z913C, % American Embassy, Asuncion, Paraguay
ZA2AW, (QSL to 65AMP)

W1S FWH JLN ODW RWS WPR WQC, ZDP, W2a
H7Z MUM OLU, W3Q0O, W6a LW NTR ZOI, W9a
BDW CFF HUZ, K4PD and the West Gulf DX Club
DX Bulletin collaborated to provide this directory.

Tidbits:

Army: "CTICB, CRABAB's pop, told CTICL that CR-8AB still needs a transmitter before he can log his first QSO. Therefore, somebody unscrupulously has been borrowing this delicious call, at least up through September 1st. ... K5AS KS and LY wonder if their marathon 8-hour QSO sets any kind of record. KAX2S (W9NHP) says he and KAZLY solved at each end. ... ZC4IP listed currently active and legible. Automatic stations ZC4s RN CA FR GH IQ IP LW MH RX and VP, in a line to W9DUDY and ODXXX in WA3ACF when on this side of the pond. ... On QSL to K16GW, KBA7M states he stands ready to furnish two, the "Black Pearl of the Pacific," to any and all the boys on 20 phone and c.w. Tex uses a BC-610, Super Pro and you been there. ... We learn that W4QFO, who regularly files point-to-point in the Korean area, is keeping an eye on the possibilities for resumption of HAM amateur activity.

Firon: From E72NJ (KB5TR, ex-M5ONJ): "All of the former M5 JA call holders retained the last two letters in their new calls [prefix E72]. There were, however, several men who were using the club call of the Radio Marine Amateur Radio Club while waiting for their own calls to come through. There were no calls issued for about three months prior to the changeover so, for a while, we had about six guys using the club call. Among this group were E72s CG MW SM WD and WW. Following is a list of the members of the Klamath River Amateur Radio Club: E72s BA CC CE CK ME MK MW NF NS SM TS WD and E72US is the club call. Cards will reach all members if sent to the club at APO 845, c/o Postmaster.
New York, N. Y." Joe adds that Karl Leono, ET2NJ, confirmed 103 of 135 countries worked in Eritrea before heading back home to W5NIL. ET2NJ closed his letter with a parting shot at poor h.f. DX conditions. — — —

Q5QR was scheduled to leave for Europe in late October and figures he'll return to the Congo by mid-1954. — — —

Via W2HSZ, W8YHO, and others he recently worked, FB5RE takes issue with FB5BB's July "How's comment, asking sparse FB5 DX activity. "FB5 OMs protest... Here 13 FB5 OMs working with 50 watts. "If they scared up more Madagascar activity we'd gladly eat our words! — — —

W3QQQ finds that 5A4TG (W7TYR) runs a VFOd 50-watt meter into a folded dipole. — — — According to W1WQG, V32RJB is interested in working Wls in his back-home Norfolk, Conn., area.

Oceania — Bill Storer, VK2EG (ex-VK1BS), continues to prepare for this winter's Australian Antarctic Expedition, gathering radio gear and working bugs out of same. Thus far he has a 100-watt transmitter and Super Pro ready to go. "Operating periods won't be specific as I will be away on field trips from our main base quite a lot. Also, conditions are pretty bad in regard to reception, so I hope the boys won't think I am standing them up or passing them by. I will work anyone I hear calling..." Newspaper clippings forwarded by Bill indicate that the expedition's scope is considerable and that the undertaking should make quite a news splash when it does take off. — — —

The present ZM6AA told ZL1HY he wouldn't mind giving Tokelaus operation a try. In a letter to W1WPO Dave writes; "The government ship Irama can fly over to the Tokelaus but it would be impossible. I guess, for outsiders. Norm (ex-ZM2RAK) said only one boat a year went there..." ZL1HY also opines that FB5WAB of Wallis isn't yet very DX-conscious and rarely makes himself available. Dave, himself, has ZL1HY on DXCC record as Oceania's top DXer and is bearing down on the 200-con

formed mark. — — — W5UXP comments VK5YF for fast QSL. The latter is running for a Md.-D.C. pastebord to complete WAS... ZC5V8, who unfortunately has been ill with malaria, writes W5MPG that he is especially anxious to QSO W1 23 and 4 stations. In fact, up through late August, ZC5V8 still hadn't worked W1 or W2... — — —

W7PLL/KG8 pulled the big switch and assures that he has QSL'd his QSOs contacts per cent. If you still need a strayed card replaced, try Cook's home QTH. In all six months of operation W7PLL/KG8 couldn't bag a W4... — — —

Bruce of KG6AAY and W5PXN/KG8 intends to put a B-Q 610, AR-88 and 8-element 14-Mc. beam into the various DX contests that come along. KG6AAY pushes quite a bit of traffic on the side. — — —

Europe — "I am very sorry to say that HE1C never was in Liechtenstein; he was a pirate. A new regulation in Switzerland is that all expeditions to Liechtenstein must be announced to our 'FCC' in Berne and to the government of the Principality of Liechtenstein. The only real HE at the moment is H6BLL in Schaan. Any Swiss station operating portable in Liechtenstein must use the portable

"W. F. Meyer, ZG6DW, turned in the top African phone score in this year's ARRL DX Competition. Bill is a DXCC member (phone) of long standing.

The "HZ1AB radio club" mans its widely-worked station with plenty of spirit and cooperation. W4TST, who sent this photo as a QSL to W0BDW, is at the left. A good many DXers owe their Saudi Arabia DXCC credits to this gang.

call," so writes H8LJ/HE... W1WPO finds that GM3HDD is the first Scot to hit the DXCC 200-mark... — — — "Just got my new license with call YO1FR, I will be on the air very soon on 15, 20 and 40 meters." This good news from Times Popove of club station YU1BDO, whose picture appeared in the September issue, YU1FR intends to maintain a 100 per cent QSL policy... Some pitch by Bohemian doings via L21KAB, 955AX and W5PMR: L21KED began operations in October with 40 watts input. L21KAB is building a new 500-watt 'phones-o.w. transmitter. L21KSA is also rebuilding, and L21KFG is a newly activated club station... GC2ZFC, who has 90 countries worked, still searches for Mont., New., N. Mex., and Utah for his WAS... G3HLS could use some advice regarding obtaining a 1951 QSL from KM6AW.

South America — From Henry E. J. Smith, ex-C1PBK: "In the period February 14, 1939, to October 28, 1939, I worked some 700 W stations and to the best of my knowledge sent QSLs to all WAS worked, through QSL bureaus... I am having some special ex-C1PBK cards printed up and if anyone is missing my card can substantiate with full dope (date, time, etc.) a QSO during the above period I will gladly mail one from here in the U. S. A... Since my return to the U. S. I have visited lots of W6s and other DX men I have worked." Henry's QTH is 384 Rockaway Parkway, Valley Stream, L. I., N. Y. ... We're going to miss PZ1WX on 40 and 30 meters. He's heading back to the PAA homeland, according to W1APA... W3- QH8 finds that C1PBK desires to secure an HZ1AB commemoration for a 1951 QSO. Can any past or present HZ1AB op give him help? — — —

Hereabouts — We hear that FCC passed out citations to some of the builders heard calling "QSL, QSL." Where VQ7UW was the object of a pileup while lecturing. Guess we'd better use the call, the whole call and nothing but the call. — — — KH6ARA may be back on from W2AIS for the lower-frequency DX season ever you read this... — — —

KP4KD, also planning 100- and 80-meter business this season, needs only the right Asian for his DUF-IV certificate. — — — W1ZL passed the 200-country mark while still sticking to his "versatile vertical," a 14-Mc., half-wave job he uses on all bands... The Eagle, organ of the Confederate Signal Corps with headquarters in Atlanta, has a new DX column edited by WA4HTW... Those who worked KP3AA or W5AGB/FM before January 6, 1952, and who still need QSLs will be interested to know that Fred T. Whiteside, P.O. Box 143, Ogdale, La., is standing by for QSL inquiries. He made a gallant effort to confirm "em all but, as often happens, a certain percentage of cards went away..." W4RNF, topping a recent QST Survey, has plastic slip covers for rig, receiver, mike and other components of his DXing set-up... W2EQS could use news of the present whereabouts of ex-K8HAQ... — — —

Explaining that his own Juneau location isn't such a hot DX spot, KL7P1 nevertheless is about to grab off his DXCC-180 sticker... Bill Bockett, one of the former W51BJ ops, paid a visit to V8EADV. Bill is anxious to get fired up once more, V8EADV still struggles to confirm an EA8DC QSO and has plenty of company in this respect.
Tropospheric DX from Ontario to Mississippi; bursts of aurora to build section totals in the Northeast; literally hundreds of portable stations swarming over the high spots from Maine to California; unprecedented activity on 220 and 420 Mc. — these are just a few of the impressions to be gathered from a quick look through the rapidly-growing pile of September V.H.F. Party reports, as we go to press. With the reporting deadline still more than a week away, we can present no comprehensive picture, but here are a few highlights:

Highest score in the history of v.h.f. contests — 12,274 points, amassed by W1MHL/1, Pack Monadnock Mountain, Peterboro, N. H. Operated on four bands for the Waltham Amateur Radio Association by W1PQM and W1QMN, assisted by W1RUD, W1LWU and W1SFls Finan and Lippincott, W1MHL/1 made 55 contacts in 11 sections on 50 Mc., 230 contacts in 15 sections on 144 Mc., 15 in 8 on 220 Mc., and 4 in 4 on 420 Mc., a staggering total of 304 stations, with a multiplier of 38. Because of their multiple-operator set-up, the boys of W1MHL/1 are ineligible for a certificate award, but we feel sure that v.h.f. enthusiasts everywhere will award them the unofficial v.h.f. contest championship by acclamation!

Top single-operator score, to date, was turned in by Margaret Roberts, W8BFQ, who made 202 contacts on 5 bands for 6727 points. Next to Margaret is another WL, Liane Waite, W2FBZ, with 186 contacts on 4 bands for 6324 points.

One-band operators will have to bear down to beat the total turned in by W1AO, Falls Church, Va. Ross worked 151 stations in a record-breaking 19 ARRL sections for 2869 points. W2AZL and W2UK, pushing for sections, had 18 each on 144 Mc.

Outstanding mountain-top work was done by W3KX/3, manned by members of the Electric City Radio Club; W6MXQ/7, Ashland Peak, Oregon; W6SV/7, Mt. Rose, Nevada; W1PSZ/1, Mt. Kearnsore, N. H.; W1UIZ/1, Mt. Monadnock, N. H.; W3PZK/8, West Virginia, and scores of others.

Activity on 220 and 420 Mc. reached the point where it was no longer necessary to work a fellow on a lower band and then have him look for you on the two pay-off bands. Especially during Saturday evening, many contacts were made on the two higher bands without prior arrangement on lower frequencies. The advancement that 420 has seen is summed up in one experience at W1HDQ. We listened on 432 Mc. around 8 p.m., and heard W3KX/3 coming through very well. Contact was no sooner established than c.w. QRM developed. This turned out to be W1MHL/1, whose modulator was giving trouble. When a New Hampshire station knocked out a Pennsylvania station, we say 420 has grown up! You would have to have been active in the early days of 420 to appreciate what this means.

More details next month.

Here and There on the V.H.F. Bands

It’s not much fun to be isolated from any large body of v.h.f. activity, so that you have to rely on non-too-frequent DX openings to hear any signals at all. Ask VE2QZ, Dartmouth, Nova Scotia, who has had plenty of experience at this sort of thing. Oscar wants to find out, once and for all, whether it’s worth the time and effort to keep going on 144 Mc., so all during September he ran automatic c.w. from 0500 to 0600 EST and 1000 to 2300 EST on 144.45 Mc. He will continue this through October, if there is interest in trying to hear his signals. Needless to say, he’d like to have reports, even negative ones. If nothing comes of this, he’s going to 220 and 420 Mc., feeling that duct effects are much more likely to produce DX on these frequencies than on 144.

We’ve always felt that it should be possible to work anywhere in the West Indies on 6 when the band is open for sporadic-E skip, but it’s not been done too often. Much of this has been laid to insufficient interest in the Islands, but VPSEM, Constant Spring, Jamaica, says that the shoe may be on the other foot. He has heard TV signals and com-

Two amateur TV enthusiasts who have camera equipment and 420-Mc. stations ready to go are WAATO, Albany, Ga., and W4HER, Burlington, N. C.
2-Meter Standings

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mercial mobile stations all through the region either side of the 6-meter band on numerous occasions, but never a ham until last 4th of July weekend. W2QRQ signals were received from Cuba, Jacksonville and Charleston and finally heard his first 50-Mc, ham. He sought the call as W2QRQ, though the identification is not certain. Where, VP5KEM asks, were all the other 50-Mc. We that night? A good question!

Everyone professed to be yearning for a Vermont contact, but that doesn't do W1MMN, Orange, Vt., much good. George is on night after night with a good set-up in a much better-than-average (for Vermont location), but his contacts few and far between. W1MMN is far enough north so that it takes a good night for him to work into most Southern New England stations and QSOs with New Jersey and New York area are rare. He can't guarantee to be on every night, as he's on 24-hour call for the State Police, but he'll be glad to keep a sharp lookout for anyone who needs a Vermont contact on 2. He especially is destined to be good going, especially since the Montreal TV station opened up on Channel 2. Aiming directly north for his TV reception, he seldom misses the first warning of a developing aurora.

If you want to get that Vermont contact drop a note (George Chandler, Lib., 22, 2206 S. 11th St., Philadelphia, Pa.), or, after every try, and the boys at both ends of the path are straining for the last small advantage in transmitter power, receiver noise figure or antenna gain that may make this dream of regular communication over a path close to 1000 miles possible. W4HJK is erecting a large rhombic in a quiet country location, and increasing his power to the legal limit. W2UK, in addition to his 40-element array, now has a rhombic 90 wavelengths on a leg, aimed at W1MMN. The beam still seems to be holding its own so far, however. Tests are being run daily, both morning and night, the morning test having been instituted at the suggestion of Villard, W8QYT, who feels that, if meteor scattering is responsible for the signals getting through, the early morning might be more productive of results.

Aurora DX on 220 Mc. We've been wondering about this one for a long time, but not too many opportunities have arisen to find out whether 220 Mc. will prove as good for this sort of thing. (We once felt that 144 was useless but look at it now!) During the aurora opening of Sept. 18th, W8BFQ went to 220 Mc. at your conductor's request. We've tried several times since unsuccessfully before. On 144, the suggestion was made that something, C.W. signal was heard. Too weak to be copied, it was heard only a few seconds, but it was enough to raise hopes that we may, one day, work some stuff on 220 by the auroral route. W2ZLD, Dunmore, Pa., has observed in the aurora on Channel 11 from Hinghamport, N. Y., 60 miles north of his location, so he is confident that 220-Mc. work is possible. Wanted: recruits to go to 220 when the 144-Mc. band is off. Can you keep your 220-Mc. rig?

That 220-Mc. band is coming along these days, and we hope that the series of articles for the beginner that started in October QST is going to help things along considerably. W3ZLD reports working W3YR recently, with signals on 220 running 6 to 8 better than on 144. This is a pretty good claim, considering that we have about 100 miles of very rough terrain. W3VIR, W2QED and W2FZB all come through well on 220 at W1HDQ, anytime the 2-meter signals are as good. The distances are 170, 210 and 130 miles, respectively, through Duarte. As far as we know, we have worked 14 different stations on 220, most of these contacts having been made without prior arrangement on a lower band. Not like the old days! What may have been the first Texas-Kansas QSO on 144 Mc. came off on Sept. 20th, when W5AJG, Dallas, worked W5JZB, Wichita, who also worked W5HHU in Dallas. This started at 0715, which is the time of W5JZB's regular morning operating schedule. W5ZB and W8MYG at Selma, Kans., have been keeping this morning schedule regularly for some time, teaming up again at 2130 and 2215 CST. W5HHU, Wakonan, Okla., works into Wichita, 150 miles solidly, and negotiate the 310 miles to 2300 CST most of the time, Vine has worked W5IOW, Ada, Okla., 235 miles, frequently and W5HDH at Buffalo, 170 miles, comes through well. To the north he is having fairly good results with W5DISR, Greendale, Wis., Catalyst just failing to make the 100 miles. W8QYT, Kansas City, 100 miles. TV reception, even on the high channels, is good over these and greater distances in several directions, so W2ZJB and W8MYG feel that much more business should be possible on 144 Mc. and possibly higher bands.

The hot weather of early September produced some beautiful inversions along the Atlantic seaboard. During the first three days of the month, W3PYW worked 52 different WIs, 2a, 3a and 4a, most of them more than 150 miles distant, and quite a few running only a few watts. 

QST for
And speaking of low power, WESBMR, River Canard, Ontario, feels that many of the fellows who are burning up kilowatts on overdriving QRM on lower bands would switch to v.h.f. if they realized how well they would be able to work out with low power. Dave has never run more than 9 watts input, yet he has worked more than 140 different stations, from Central New York to beyond Chicago. His rig uses receiving tubes throughout, and the components are largely salvaged from earlier uses. The line-up is a 6AK6 oscillator, a 12A7 tripler-doubler, another 12A7 tripling to 144, and a 12AV7 final. The modulator uses a 6AJ6, 6SN7 (one half as a tone oscillator), and a 618 output. The antenna is a 4-over-4, mounted just above the roof.

W9OVL, Hammond, Ind., writes that 220-Mc. activity is coming along well in the Chicago area. W9DRN is now working out with a new 9603 final, and W9DPO, Sheboygan, Wis., is testing a new 100-watt rig on 220. W9REM started something with his crossband 220-144 work. Many others have taken up the idea on 220 now, and the 2-meter gang are getting a lot of fun out of it, too. The two bands make an ideal duplex combination, and hearing a fellow talking you can’t hear almost invariably generates the urge to get something going on the other fellow’s band.

Hints on Lowering Noise Figures

Though he already had the lowest noise figure on 444 Mc. that we’ve heard of to date (under 3 db), W2AZL was still not satisfied. Checking the input impedance of his 417A cascode r.f. amplifier, he found it to be only about 300 ohms. Feeling that this was the result of the cathode lead inductance, Carl experimented with various values of cathode by-pass on the first stage of the cascode, to tune out the effect of the lead inductance. Reducing the by-pass capacitor from 500 to 100 μf. brought up the input impedance to 2000 ohms. Going to 30 μf. raised it to 7000 ohms, but at this point the stage became unstable.

Experiment showed that 50 μf., stabilized the circuit, but brought up the over-all gain considerably. The improvement in noise figure was nothing short of phenomenal, the indicated result now being under 1 db. Admittedly, this may not be an exact noise figure, but a similar operation has now been performed on several converters, and in each case the improvement in performance has been the same. The results also check on two different types of noise generators.

The input circuit is self-resonant, with the antenna tapped at the center of the coil through a 7-45 μf. ceramic trimmer that tunes out the reactance of the coupling system. Otherwise, the circuit is the conventional cascode. This approach is probably most useful with very high-gm tubes like the 417A, but it raises the possibility of employing the same technique on 220 and 420 Mc., with the idea of getting effective performance with the cascode circuit on those higher bands. There is a good chance that somewhat better noise figures might be obtainable than we now get with the grounded-grid stages generally used on 420. This will take some doing, however, as the 6J4 job described in August QST checks out under 6 db. at 420 Mc.

Another idea for hopping up stages using tubes like the 6HQ7 is suggested by W3LZD. Ted finds that running the tube hot helps. He uses only 50 ohms cathode resistance on a 6GH7A or 6D7, thus making the tube draw more plate current, and raising the gm. With 150 to 200 volts in the plate supply, the usual 100 ohms or so of cathode bias cuts down the tube performance appreciably. We tried this on 6H87 stages currently under construction for 220 and 144 Mc., and found that a slight improvement was observable as the cathode resistor was changed from 100 to 68 ohms. Reduction of the cathode by-pass value, as suggested above, did not affect the performance of these converters, but we hope to try it soon with the hotter tubes, and at 220 and 420 Mc.

Here are two more ideas for improving 420-Mc. reception, W3VIR, Willow Grove, Pa., and excellent results with his 6J4 preamplifier as described in August QST, except that there was considerable spurious stuff along with the signals. He reduced the value of the coupling condenser, C1 in Fig. 2, to 15 μf., dropping the spurious signals down without affecting those in the desired frequency range.

In the same type of amplifier, W2FBR, Montclair, N. J., found it helpful to tune out the reactance of the output coupling loop, L1, with a series trimmer. Ralph was able to get a noise figure about 2 db. lower with this trimmer than without it.

OES Notes

We hope that all OES appointees enjoyed the big Bulletin prepared largely by W1WYM, and mailed out during September to nearly 300 holders of the appointment. If we can keep Ellen on the job, perhaps you’ll be hearing from us in that way more often than in the past. The OES family is growing steadily, but there is room for many more. If you
have a continuing interest in the frequencies from 50 Mc.
up, why not join up? A card to your SOM (his is listed on
Page 6) or to ARRL Headquarters will give you all the
details.

Though space limitations don’t allow a section under the
above heading in every issue of QST, QES reports are always
used in compiling the v.h.f. column. Signing up for the QES
appointment puts your name on the mailing list, not just in
the QES Bulletin, but also for copies of any special
official bulletins that have to do with v.h.f. work. You’ll
get the latest news on outstanding v.h.f. accomplishments
and projected tests or expeditions, and what is per-
haps even more important, you become a full-fledged mem-
er of the ARRL family.

W2UTH, Rochester, voices a complaint that is heard
too often these days. Hank says that there is too much
digging for DX and not enough willingness to work the
fellow who happens to be in the land of opportunity. He
claims that most of us have one more or less "hot box" on
the New York zone. "The Western New York gang have a particularly bad
time of it on this score. During aurora openings, especially, the
"wheels" tend rapidly over anyone signing "W", with the result that
many of the boys out Rochester and Buffalo way have a hard
time getting contacts with Wia, New Jersey W2s and other
relatively near, but normally hard-to-work, areas.

W4FLW, Dresden, Tenn., says that things are looking up
on 50 Mc. in western Tennessee. He runs nightly schedule
sessions with W4FRF in Nashville, with a very high percentage
of success on voice. Power is about 90 watts at both stations.
There is a local 5-meter net, not counting DX, and this is
generating interest on the part of a number of Novices and
SWLs. Some who have commercial receivers that do the
50-Mc. band. Harry hopes to have more activity on 6 there soon.

W80Z, Columbus, Ohio, is accumulating 3-wm. gear.
Callers are not entirely expecting to do much two-way work on
that band, but hopes to get acquainted with the techniques and
be ready, just in case anyone else wants to give it a try in
that area.

W8GFL, Green Bay, Wis., reports that their new v.h.f.
club has now grown from 56 paid-up members, including 37 licensed
hams. The advent of a v.h.f. TV in Green Bay has caused little
trouble or no trouble to date. All bands through 144 Mc. are being
worked regularly all through the area.

W9LEE, Westboro, Wis., has been working WLBN, Green
Bay, for two years. A schedule like this, kept religiously, will show
that 144 Mc. (or any other v.h.f. band, for that matter) is much better for
daily work over 100 miles or more than most people realize.

Which probably makes this as good a place as any to report
that your conductor’s 0700 sked with W2QED, Sears-
brook, N. J., is also well into its third year. So far in
1953 the operation has been about 90 per cent successful, a con-
siderable improvement over 1951 and ’52. Since early summer,
W2QED has been received practically every day on 435 Mc., and is set up to transmit on 50 and 220 Mc.,
also, at will. Contact is established on 144 Mc., and
the other bands are checked at frequent intervals. The 50
and 144 bands seem much alike, ordinarily, with 144 running
above when conditions are good. Two-twenty and 435, double
exposed to weather variations much more, and the strongest signals
heard over the passes have been on 435 Mc. Ken will
run as much as 20 db, stronger on 435 than on 144, when
conditions are favorable, and not more than 5 db, below 144
under adverse conditions.

The Biggest Antenna?

Antennas are getting bigger every day. Time was when a
fellow who put up a 16-element array for 144 Mc. had
something pretty good, but things have reached the point
where the 16-element job and the Twin-Five are kid stuff.
W2NY started it when he expanded the "Brownie Beam" to
39 elements, and the competition has been going on ever
since. W2UK went to 40 elements, adding another pair of
5-element arrays to the stack of six described by W2NY.
Then came W2VCH, and finally the following fall, F. U. K. Held
the W2NY design, making huge arrays that were 4 sets
of Yagis wide and 3 sets high, with full-wave spacing each
way.

Now we hear of what may be termed, with some assurance
of being able to make it stick, the " antenna to end all antennas," W2QER, Erie, Pa., has 114 elements in a
monstrosity came about when Herb decided to find out
what could be done with long Yagis. First step was 10 ele-
ments in line. When this job was matched up properly,
checks were made with W8VJC, making comparisons with a
reference dipole. Carefully-conducted tests indicated 13.4
db gain over the 100-mile path. Then adding another 3
directors netted about one more decibel.

This seemed to be the practical mechanical limit for in-
line elements, so 8 of these 13-element jobs were made and
assembled 4 wide and 2 high, the vertical spacing being
about 10 feet. This nightmare, 27 by 10 feet in size, was then
hoisted to 43 feet above ground. Anyone who has worked
with large arrays will understand that getting optimum perfor-
mance, or even accurate performance data, is no cinch
with a colossal like this, but Herb’s results indicate that it
is at least 8 db, better than the [illegible] array, despite a
difference in height of 23 feet, in favor of the 10-element
job. Gain is in excess of 21 db.

Nails either side of the main lobe are about 15 degrees
apart, and the feeding point W5NL, by the half-power points.
In ground-wave work the antenna is terrific, when
correctly oriented, but aiming is something of a problem,
because of the sharpness of the pattern. In aurora work the thing
is red-hot, but here the directivity is troublesome. Shifting of the angle of arrival of the signals becomes
very noticeable, and frequent turning of the array is
necessary. (Continued on page 186)
The Military Affiliate Radio System will observe its fifth anniversary of operation on November 26, 1953. A special message is being prepared for transmission from the headquarters station WAR/AIR. The message will be transmitted on MARS frequencies 3497.5, 6997.5, 14,405, 20,994 and 27,994 kc. at 0100 GCT on November 27th. It will be repeated at 0400 on the same day, using the same frequencies.

Army MARS stations are planning a 24-hour Command Post Exercise on Army MARS frequencies to be conducted on the anniversary weekend. The exercise will begin at 1800 GCT on November 28th and will be conducted in contest form. Details have been furnished MARS Directors for dissemination to member stations at the local level.

In general, the purpose of this exercise is to test the flexibility and efficiency of MARS operators and equipment, and to permit MARS operators to establish contact with other MARS stations using military frequencies and call signs. Participation in the contest will not prejudice use of the system for its assigned mission. MARS administrative or quasi-official traffic which has a precedence higher than routine will be handled by means of a special pass on c.w. circuits and by means of a special prorow on voice circuits.

Exercise logs will be graded and checked by the Chief, MARS (Army), Room BE-1000, The Pentagon, Washington 25, D. C.

Naval Reserve Electronics Division 12-21 (KSNAC) of San Mateo, Calif., and the North Peninsula Electronics Club (W6PMR) of South San Francisco, Calif., will sponsor an ARRL Field Day activities, W6QIE, of the club, furnished a trailer with communications equipment, Antenna masts and a gas-engine generator were furnished by the Reserve electronics unit. The group made 566 contacts on 80, 40, 20 and 2 meters, using both c.w. and ‘phone. Naval Reserves participating: W6s GXP, LAD, MFW, QIE. Other operators: W6s MHI, MMG and NVO.

Outstanding Units

The following activities have been designated as the outstanding Naval Reserve electronics units of their respective types in the naval districts as listed.

Third Naval District: Electronics Division 3-2, Auburn, N. Y. (K2NQA); Electronics Company 3-37, Red Bank, N. J. (K2NAP); and Electronics Plt. 3-1, Middletown, N. Y.
Fourth Naval District: Electronics Division 4-1, Chillicothe, Ohio; Electronics Cmp. 4-2, Princetown, N. J.; Electronics Plt. 4-6, Bradford, Penn. (K3NAB).
Fifth Naval District: Electronics Division 5-1, Parkersburg, W. Va. (K3NAT); and Electronics Company 5-10, Ashland, Ky.
Sixth Naval District: Electronics Division 6-7, Dalton, Ga.; Electronics Company 6-23, Marianna, Fla. (K4NBO); and Electronics Plt. 6-30, Brevorty, Ala.

Club Activity

The Caddo Amateur Radio Club of Shreveport, La., meets monthly at the local Naval Reserve Training Center. Special projects consist of a T.V. committee and a mobile club for disaster work. The training center furnishes code practice for prospective amateurs. Among the most active members are W5JSW, W6TRT, W5NEI, W5PVR, W5QCG, W6SSR, W5SUM and W5WNR.

Here and There

Cmdr. L. M. Hill, USNR, (W7QXM) of Thirteenth Naval District Headquarters was recently selected for promotion to Captain, USNR.

The following Naval Reservists recently received their amateur licenses: George W. Cook, Jr., Route 4, Troy, Mo.; Marion C. Whit, (W4ZAX) of Naval Reserve Electronics Plt. 6-44, Gainesville, Ga.; W. F. Warren (W4YFD) of Naval Reserve Training Center, Columbus, Ga.; and W. J. McCoy (W5QYA) of Naval Reserve Training Center, Gulfport, Miss.

The following amateurs are on duty with the Navy Department in the Washington area: W6s MKA NK, W2ZNM, W6s EK KUC KJ7 SSL TCB USK VDI WAM, W6s CMF DDT RPI ROK BTX TCU V18 WUF YVV ZTD, W6s JMI PLQ RCB, W6s BKK PII, W6s EMM YCL, W6s MMH MZL and K66FF.

HAMFEST CALENDAR

WISCONSIN — Sunday, December 6th, at the Petriying Springs club house, Kenosha — the Kenosha Radio Communications Society will hold a hamfest known as "Operation Frostbite." There will be a trophy contest, treasure hunt, and plenty of entertainment for the whole family. Eggs, coffee and soda pop will be provided. A good speaker is expected to address the group. Registrations should be mailed to Earl Burden, Route 1, Box 217, Kenosha. For receipt not later than Nov. 21st. The price is $1.50 per person, $2.00 per family.

November 1953 67
Annual Report Statistics. The last annual report of the Communications Manager indicated that the ARRL Field Day, reaching new highs in participation each year, is the greatest operating activity explaining us amateurs in favorable terms to the public. It is believed that the '53 Field Day “did it again.” The League code proficiency and W1AW program continued to have outstanding results, and reached new areas of real service to the whole fraternity. Popularity of this already popular program was (in '52) 70% above the previous year's level. There were 40 emergencies, major and minor, involving amateur communications in '52 and reported in QST. Station appointments were up 13% for the year. DXCC applications, barometer of current DX conditions, were off 12% on the year (286 issued) but the Rag Chews Club forged ahead to an all-time high of 2251 certificates issued (a plus 30%) for '52. DXCC endorsements (at 1141) held at the top level due to the accumulated group holding that award. The number of WAS certificate awards (824) has been stabilizing since the all-time high of 599 issued in '49.

Net Periods for WNs? WSTFB, Wichita Falls, Tex., kept his NTX net operational all summer. In his August bulletin he appeals for outlets in a list of additional cities, or where coverage is needed on more nights for daily radio service. NTX, working on 3760 kc., invites WNs to QNI from 3735 kc. at 1000 week-day nights, on transmission of “Q5X WNs” by the NCS. It's an idea for many section nets to try out, too, we think. This can be a way for some nets to get more coverage this fall, and may be made part of the standing coriand invitation of nets to extend membership to the newcomer. Of course, the individual members will all use regular section net frequencies when they have General Class.

Operating as a Communicator. We in amateur radio think of the communicator as one who makes the world go around through responsible handling of two-way communications, rather than one imitating broadcasters or entertainers. The Novice must develop operational skill to a degree to pass the Government examination. General Class amateur, commercial, government and private system operators must carry good practices and procedure technique even further. To rate esteem as a communicator right operating habits should be cultivated from the start; then there is less to unlearn in acquiring a reputation among one’s fellows of being a top operator. Clean accurate sending is the first aim in code work; businesslike attention to accuracy and clarity (avoiding excess wordiness) if communicating by voice. Surprisingly, real communications efficiency is based on proper sending which will eliminate most occasions for repeats. Brevity is essential to convey a maximum of intelligence correctly in minimum time of operation. The standard form of procedure pays dividends in message work, aiding in accuracy and check of word count. The handling data, call and time, the operator's receipt (R), accepting responsibility for consequent handling of the traffic so indicated, is recorded right on the message.

In concluding a transmission use a one-times-one call. To receive send R for OK (no wasted words). Above all, never contradict “R” by asking for missed portions! If repeats are required, ask them by AA? or AB? and omit sending “R,” which implies “all received OK.” Use of common Q code (abbreviations as indicated on pages 14-15 of Operating an Amateur Radio Station) can save plenty of time, permitting interchange of more intelligibility on other subject matter, and helps prepare one for General Class license by assuring familiarization with the terms.

If you like, drop a line or radiogram to ARRL requesting the free Operating Aids card which explains use of K, AR, KN, SK, CL. In concluding a transmission use the appropriate ending signal only. The communicator does not waste words “turning over” a contact; he uses these correct procedure signals or the voice equivalents, “go ahead,” “over,” “end of message,” “closing station,” as required.

Suggestion from K6DV. Always listen three minutes before transmitting and that includes any testing. Such consideration for others prevents unnecessary QRM and is the way to help improve operating conditions for ourselves as well as others. During a recent code proficiency transmission from W60WP there was QRM on both 7138 and 3590 kc. Evidently some amateurs don't read any radio journals, because their interference must be unintentional. It is suggested that on monthly Qualifying Runs of W1AW or W60WP, so closely followed by hundreds of amateurs, that when such QRM difficulty appears, the stations identified as causing trouble be notified and asked for future cooperation.

20th ARRL Sweepstakes Contest. This is a Saturday-evening-and-Sunday activity with two periods starting Nov. 14th and 21st, and always the top nationwide radio operating event in the new fall radio season. This year, in addition to the usual certificate awards to section 'phone
and c.w. winners in each of the ARRL sections (see Page 6), there’s a section certification also for the highest-scoring Novice or Technician wherever at least three submit logs to constitute competition. Don’t miss this chance to give the station a real workout! If you’re on the air anywhere in U. S. and Canada. Work in the “SS1” builds operating skill. You are bound to meet new friends and find some new states, if on the road to achieving WAS status. Best luck in the SS1
— F. H. H.

**DX CENTURY CLUB AWARDS**

**HONOR ROLL**

<table>
<thead>
<tr>
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**RADIO TELEPHONE**

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<td>XH1AC</td>
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From August 15, 1933, to September 15, 1933, DXCC and endorsements based on postcard contacts with DX countries or more states have been issued by the ARRL Communications Department to the amateurs listed below.

**NEW MEMBERS**

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**ENDORSEMENTS**

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**RADIO TELEPHONE**

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<td>H2OCA</td>
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<td>L2QDD</td>
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</table>

**CODE PROFICIENCY AWARDS**

Have you earned an ARRL Code Proficiency Certificate yet? Twice each month special transmissions are made to enable you to qualify for the award. The next qualifying run from W1AW will be made on November 10th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1955, 1575, 1245, 1400, 2020, 52,000 and 145,000 kc. The next qualifying run from W9WQP only will be on November 7th at 2100 PST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST. (Exceptions: There will be no code practice transmissions from W1AW November 10th, when a special Frequency Measuring Test will be transmitted, and November 26th, Thanksgiving Day.) References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text is reversed during certain of the slow-speed transmissions. To get sending practice, hook up your own key and buzzer and attempt to send along with W1AW.

**CODE-PRACTICE STATIONS**

The following is an up-to-date list of all stations currently transmitting code practice in the ARRL Code-Practice Program:

W1ACF, Fall River ARC, 57 Richmond St., Fall River, Mass.; 3545 kc.; Mon., Wed., Thurs. and Fri., 1900 EST; 5-7 w.p.m.
W1SBK, Al Vesco, 81 N. Main St., Thompsonville, Conn.; 2000 w.p.m.; Mon., Wed. and Fri., 1900 EST; beginners’ speeds.
W2FHE, William Tese, Mountain Ave., Hillburn, N. Y.; 3090 kc.; Sat. and Sun., 1400 EST; 5-18 w.p.m.
W2NRM, Howard R. Jack, Browns’ Trailer Court, Rte. 6, Lodi, N. J.; 1800 kc.; Mon. through Fri., 2200 EST; Sat., 0800 EST; 2-5 w.p.m.
W2WDT, Henry Bergmann, 1028 Jefferson Ave., Brooklyn 21, N. Y.; 29 Mc.; Wed., Thurs. and Fri., 2100 EST; 5-10-15 w.p.m.
W2YT, Andrew C. Clark, 41 Lenape Dr., Miami Springs, Fla.; 23.8 Mc.; Mon. through Fri., 2030 EST; beginners’ speeds.
W4RUR, Edward J. Blatt, 506 16th Ave. So., St. Petersburg, Fla.; 28.05 Mc.; Mon. and Wed., 1900 EST; 6-22 w.p.m.
W6JZ, Ray Correll, 1095 Curtis St., Albany 6, Calif.; 3590 kc.; Mon., Wed. and Fri., 1830 PST, 5-23 w.p.m., 1920 PST, 35-45 w.p.m.
W5QBN, Bob Conley, Route 1, Box 411, Escalante, Calif.; 3760 kc.; Sun. through Thurs., 1830 PST, 4-6-10 w.p.m.
W6USN, Cmdr. J. M. McCoy, 12th Naval District Reserve Electronics Unit, Bldg. 7, Treasure Island, San Francisco, Calif.; 3590 kc.; Tues. and Thurs., 1830 PST; 5-25 w.p.m.
K7FAG, Russel R. Henderson, Capt., USAF, MARS Auxiliary, Davis-Monthan AFB, Tucson, Ariz.; 28.6 Mc.; Thurs., 1830 MST; 3-24 w.p.m.
W7FWD, O. U. Tatro, 513 N. Central, Olympia, Wash.; 3690 kc.; Mon. through Fri., 1700 PST, 4-25 w.p.m.
W5BIAI, Bismarck Amateurs Radio Assn., RFD 1, Box 147F, St. Joseph, Mich.; 1890 kc.; Mon. through Fri., 2000 EST; 5-20 w.p.m.
W0ODD, Radio Amateurs of Marquette Univ., Marquette Univ., 615 N. 15th St., Milwaukee 3, Wis.; 29.2 Mc.; Mon. and Wed., 1900 CST; letters to 6 w.p.m., practice from 8-15 w.p.m.
W9CHQ, Bob McMullin, Route 1, Lehigh, Nebr.; 3690 kc.; Mon. through Fri., 1700 CST; 5-13 w.p.m. with text from The Brandle Technical Press.

November 1953

69
AMATEURS SUCCESSFUL
IN SURPRISE F.C.D.A. ALERT

A number of West Coast and Alaskan amateur stations participated directly for the first time in an F.C.D.A. (Federal Civil Defense Administration) simulated emergency operation June 20th. The F.C.D.A. test exercise involved a simulated enemy attack on Alaska and sections of the West Coast. During initial communications, a prearranged group of amateurs were alerted via regular F.C.D.A. communications channels. Contact was quickly established between WS-SEI/4, operating at an F.C.D.A. emergency operations center, and WZ7T, Carson City, Nevada, who relayed via W6JZ to the Berkeley, Calif., F.C.D.A. Regional Office. Shortly thereafter contact was established with W7LIO, Seattle, who handled traffic via landline to the Seattle Regional Office. W7BA also worked directly with F.C.D.A. National HQ, providing a relay to K7AIR for Alaskan traffic.

A portion of the F.C.D.A. traffic with the two regions and Alaska was transmitted in both directions over this temporary amateur route during a period of four and one-half hours. Good contact was maintained on 14,100 kc. c.w. between WS-SEI/4 and the W7 stations participating, despite erratic conditions. W7ZT shifted between 14 and 7 Mc., relaying to W6JZ on the latter band, and W7BA relayed to K7AIR on 14-Mc. phone. All traffic was successfully and promptly delivered, despite some difficulties arising from unfamiliarity with F.C.D.A. traffic procedures.

NET DIRECTORY

Here it is, the first installment of the annual ARRL Net Directory. These nets are the ones registered with ARRL up to and including September 17, 1953. If your net is not listed below, please send us the registration data requested on page 64, September QST cards are available from ARRL Headquarters, but their use is not mandatory for net registration. The next list, supplementing this one, will appear in January QST.

The complete cross-indexed directory of all registered nets will be available about December 1st. If you have not yet registered your net, do it now if you want to get in the complete directory. Nets are registered in the ARRL Net Directory only upon request, and only upon receipt of complete information.

<table>
<thead>
<tr>
<th>Name of Net</th>
<th>Freq.</th>
<th>Time</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>All College Net (ACN)</td>
<td>3575</td>
<td>1715 EST</td>
<td>Thurs.</td>
</tr>
<tr>
<td>AREC Net (Calif.)</td>
<td>3900</td>
<td>1030 PST</td>
<td>Sun.</td>
</tr>
<tr>
<td>ARRL Trunk Line J</td>
<td>3555</td>
<td>1945 CST</td>
<td>Mon.-Sat.</td>
</tr>
<tr>
<td>Barnyard Net</td>
<td>3924</td>
<td>0800 EST</td>
<td>Mon.-Sat.</td>
</tr>
<tr>
<td>Caravan Club (Tex.)</td>
<td>3995</td>
<td>1300 CST</td>
<td>Sun.</td>
</tr>
<tr>
<td>College Phone Net (CPN)</td>
<td>3855</td>
<td>1515 EST</td>
<td>Fri.</td>
</tr>
<tr>
<td>Early Bird, Transcontinental Net</td>
<td>3845</td>
<td>0445 EST</td>
<td>Mon.-Fri.</td>
</tr>
<tr>
<td>Eastern Area Net (EAN)</td>
<td>3670</td>
<td>2030 EST</td>
<td>Mon.-Fri.</td>
</tr>
<tr>
<td>Fifth Regional Net (IRN)</td>
<td>3645</td>
<td>1945 CST</td>
<td>Mon.-Fri.</td>
</tr>
<tr>
<td>Finger Lakes Net (N.Y.)</td>
<td>145,350</td>
<td>2000 EST</td>
<td>Fri.</td>
</tr>
<tr>
<td>First Regional Net (IRN)</td>
<td>3605</td>
<td>1900 EST</td>
<td>Mon.-Fri.</td>
</tr>
<tr>
<td>Fla. Emerg. Phone Net (FEPN)</td>
<td>3910</td>
<td>1815 EST</td>
<td>Tues.</td>
</tr>
<tr>
<td>Fla. Phone Traffic Net (FPTN)</td>
<td>3945</td>
<td>0700 EST</td>
<td>Mon.-Sat.</td>
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<tr>
<td>Fourth Regional Net (ARN)</td>
<td>3615</td>
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<td>Mon.-Fri.</td>
</tr>
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<td>Gator Net (GN)</td>
<td>7105</td>
<td>1835 EST</td>
<td>Tues.</td>
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<tr>
<td>High Noon Net (HNH)</td>
<td>3725</td>
<td>1200 EST</td>
<td>Daily</td>
</tr>
<tr>
<td>Hit &amp; Bounce Net</td>
<td>7100</td>
<td>0100 EST</td>
<td>Daily</td>
</tr>
<tr>
<td>Illinois (c.w.) Net (ILN)</td>
<td>3515</td>
<td>1900 CST</td>
<td>Mon.-Fri.</td>
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<tr>
<td>Ill. Emergency Net (IRN)</td>
<td>3940</td>
<td>1800 CST</td>
<td>Tue., Fri.</td>
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<td>Kansas C.W. Net (KCN)</td>
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</tr>
<tr>
<td>Knights of the Kilocycles (Fla.)</td>
<td>3910</td>
<td>0730 EST</td>
<td>Sun.</td>
</tr>
<tr>
<td>Lancaster (Pa.) Emerg. Net</td>
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<td>Mon.</td>
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<tr>
<td>Maple Leaf Net (MLN)</td>
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<td>2100 CST</td>
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<td>Md.-Del.-D.C. Section Net (MDD)</td>
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<td>1930 EST</td>
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<td>Md. Emerg. Phone Net</td>
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<td>1830 EST</td>
<td>Mon.</td>
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<td>Mich. QMN Net</td>
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<tr>
<td>Mission Trail Net (MTN)</td>
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<td>Mon.-Sat.</td>
</tr>
<tr>
<td>Monticello Net (MNC)</td>
<td>3564</td>
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<td>Mon.-Fri.</td>
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<tr>
<td>Mo. Traffic Net (MON)</td>
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<td>Mon.-Fri.</td>
</tr>
<tr>
<td>Nebr. C.W. Net (NEBR)</td>
<td>3520</td>
<td>1900 CST</td>
<td>Mon.-Fri.</td>
</tr>
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<td>New Mex. Breakfast Club</td>
<td>3883</td>
<td>0700 MST</td>
<td>Mon.-Sat.</td>
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</table>

At a hamfest sponsored by the South Hills Brassounders and Modulators in Pittsburgh, this picture of the Western Penna. ORS Traffic Net and some friends was taken. Back row: l. to r.: W1WPR (ex-W3OUD, now at W1AIA), W3UVD, W3CA (SEC); W3MIZ, W3N1UG (RM), W3MEF and W3KWL (ex-SCM). Front row: W3SIJ, W3TP, W3UHN (RM), W3NCD (SCM), W3BHP (SCM), W3GEG (Director) and W3WRE. You'll hear a lot of these calls on 3RN, too.
## BRASS POUNDERS LEAGUE

Winners of BPL Certificates for August traffic:

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BPL for 100 or more originations-plus-deliveries:

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</tbody>
</table>

The BPL is open to all operators who report to their SCM a message total of 500 or more originations-plus-deliveries for any calendar month.

New Mexico C.W. Net
N. M. Emerg. 'Phone Net
N. Y. State Net (NYS)
N. Y. State Slow-Speed Net (NYSB)
Ninth Regional Net (GRN)
N. C. C. W. Net (NCN)
N. Texas Emerg. Net
N. Texas/Okla. Traffic Net (NTO)
N. Texas Traffic Net (NTX)
Novice Hurricanes Net
Okla. C. W. Net (OLZ)
Okla. 'Phone Emerg. Net (OPEN)
Ont. Restricted-Speed Net (HRN)
Ont. Section Net (OSN)
Palmetto Net (Pla.)
Penn. Fone Net
Quebec Emerg. Net (QEN)
Restau de Trafic VE2 de la Province de Quebec
River Forecast Net (RFN)
River Forecast Net (RFN)
River Forecast Net (QRFN)
Second Regional Phone Net
Sound Trafic Net (Wash.)
S. Dak. C. W. Net (S)
S. Dak. 'Phone Net
Tenn. C. W. Net (TN)
Tenn. 'Phone Net (TPN)
Thirteenth Regional Net (TRN)
Transcontinental Phone Net
Transcontinental Relay Net (TCRNR)
Tropical Phone Traffic Net (Tfn.)
Truckies Meadows Net
Tank Line Atlantic-Pacific (TLAP)
Vermont C. W. Net (VTN)
Vermont 'Phone Net
Virginia C. W. Net (VN)
Virginia Fone Net (VFN)
Va. Novice Net (VNN)
Virginia Slow Net (VSN)
Washington Net (WSN)
Watch Dog Net (WDE)
Weber Co. (Utah) AEC
Western Mass. Net (WMN)
Wis. C. W. Net (WIN)

A.R.R.L. ACTIVITIES CALENDAR

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov. 7th</td>
<td>CP Qualifying Run — W6WP</td>
</tr>
<tr>
<td>Nov. 14th-15th</td>
<td>21st-22nd: Sweepstakes</td>
</tr>
<tr>
<td>Nov. 16th</td>
<td>CP Qualifying Run — W1AW</td>
</tr>
<tr>
<td>Dec. 6th</td>
<td>CP Qualifying Run — W6WP</td>
</tr>
<tr>
<td>Dec. 15th</td>
<td>CP Qualifying Run — W1AW</td>
</tr>
<tr>
<td>Jan. 8th</td>
<td>CP Qualifying Run — W6WOP</td>
</tr>
<tr>
<td>Jan. 9th-10th</td>
<td>V.H.F. Sweepstakes</td>
</tr>
<tr>
<td>Jan. 9th-10th</td>
<td>Novice Round-up</td>
</tr>
<tr>
<td>Jan. 13th</td>
<td>CP Qualifying Run — W1AW</td>
</tr>
<tr>
<td>Jan. 16th-17th</td>
<td>CD QSO Party (c.w.)</td>
</tr>
<tr>
<td>Jan. 23rd-24th</td>
<td>CD QSO Party (phone)</td>
</tr>
<tr>
<td>Feb. 6th</td>
<td>CP Qualifying Run — W6WOP</td>
</tr>
<tr>
<td>Feb. 9th</td>
<td>Frequency Measuring Test</td>
</tr>
<tr>
<td>Feb. 11th</td>
<td>CP Qualifying Run — W1AW</td>
</tr>
<tr>
<td>Feb. 12th-14th</td>
<td>DX Competition (phone)</td>
</tr>
<tr>
<td>Feb. 26th-28th</td>
<td>DX Competition (c.w.)</td>
</tr>
<tr>
<td>Mar. 7th</td>
<td>CP Qualifying Run — W6WOP</td>
</tr>
<tr>
<td>Mar. 12th</td>
<td>CP Qualifying Run — W1AW</td>
</tr>
<tr>
<td>Mar. 13th-14th</td>
<td>DX Competition (phone)</td>
</tr>
<tr>
<td>Mar. 26th-28th</td>
<td>DX Competition (c.w.)</td>
</tr>
</tbody>
</table>

November 1953
There is a great deal of organizational talent among 100,000 hams. There is bound to be trouble is that most of this talent is tied up in other fields during normal times, and the organization and leadership of our amateur groups are left to whomever remains to do it. Sometimes this remainder is too high, sometimes it is mediocre, and sometimes there is just no remainder. In any event, emergencies generally are the coming to the fore of leading intellects who are unable to restrain their leadership qualities despite the fact that they have not been active organizationally. This quite often leads to intra-amateur strife.

We have always been of the opinion that if you want to do something badly enough you'll somehow find the time to do it. This is the reason why we say it makes no sense for the ARC to advertise in the news media. If what they really mean is that they have other activities they consider more important, that whatever time for relaxation they get (and everybody gets some) they prefer to spend in other ways. This is quite all right, of course, and no one can or wishes to challenge their right to decide this for themselves.

Come an emergency, however, these same people who do not care to participate in preparedness exercises or organization are right in there to do their part. If the local group is properly organized, there will be a place for them, a job for them to do, even though they have never previously liked a finger. They're just not cut out for training and sometimes callously refer to as "bodies," and even without organizational training there are things they can do on the spot, like answer telephones, keep logs, or service equipment. Yes, they can and should probably do some of these things if the local EC, who perhaps works behind the counter at the local radio parts store, has the temerity to ask this of an engineer in a large manufacturing concern, or a professor of physics at the local university.

What we are trying to say to all concerned is this: The EC who knocks himself out during normal times to keep the local ARC unit going and to build it up into an effective emergency communications facility is not just keeping a light on for someone of superior ability who will make himself available when the need for his services is great enough. All local amateurs are responsible for, and in an emergency responsible to, the EC holding that job, no matter who or what he is. Could it be that someone else could do a better job, if they "had the time." Your EC is taking the time to do it, or to try to do it, in the best way he knows how. If you have the time to assist him, that's fine; if not, then you ought to be prepared to do as you are asked to do without demurral if or when the time comes that an emergency arises of such gravity as to warrant contribution of your valuable time.

On August 13th, W3ECP monitored the Tar heel Net and the Virginia Phone Net during the better part of the evening and until 0002 EST. Operating activity was limited to "shouting" a few stations who might otherwise have interfered with the nets. On August 16th, W3ECP reported into and monitored the Maryland Emergency Phone Net from about 1000 EST. At 1148 EST, upon inquiry from NCS of MEPN as to alternate frequencies on which C.W. traffic could be handled, the MDD Section Net was activated on 3650 kc. W3JC and W3ECP alternated as NCS of MDD until the need for further communication ended at 2000 EST. Those who reported into MDD during the period of emergency activation: W3s BFF CJT ECP NJRT TRN TRL UOE, W4YTC, W2HJD, K2CQW — W3ECP, HM M4 - DE - D . C .

The ARC organization of Bristol, Tenn.-Va., was pressed into service on July 22nd - 23rd when health authorities decided to conduct a mass inoculation of gamma globulin to arrest the epidemics of polio. On July 22nd one transmitter and two receivers were set up at the headquarters building, and amateur radio equipment was available with centers in West Bristol, East Bristol and Abingdon, Va. That night a fifth station was provided for the center at Lodi, Va., where only one four-party telephone was available.

Two frequencies in the 140-100 meter band were used. During the first few hours of operation we were nearly swamped with messages. Thereafter, a fairly constant stream of traffic kept all operators busy. Traffic concerned medical supplies, food, workers, automobile dispatching, inoculation statistics and occasional consultations between doctors. The operation was termed "Operation Ouch," and the assistance of amateurs was required because of the limited telephone facilities available between inoculation centers.

The supply of gamma globulin was exhausted on July 23rd and the operation concluded, officials expressing the greatest appreciation for the valuable communications assistance.

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**NATIONAL CALLING AND EMERGENCY FREQUENCIES**

**C.W. PHONE**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Call Letters</th>
<th>Mailing Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>3850 kc.</td>
<td>14,050 kc.</td>
<td>3875 kc.</td>
</tr>
<tr>
<td>7100 kc.</td>
<td>21,050 kc.</td>
<td>7250 kc.</td>
</tr>
<tr>
<td>28,100 kc.</td>
<td>29,640 kc.</td>
<td>28,100 kc.</td>
</tr>
</tbody>
</table>

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3335, 7050, 14,060; phone — 3815, 14,160, 28,350 kc.

**NATIONAL RTTY CALLING AND WORKING FREQUENCY**

3620 kc.

This frequency is generally used by amateurs using radioteleprinty throughout the United States. Other frequencies are under discussion and will appear under this heading in future issues of QST.

In the Waco tornado disaster (July QST, p. 64, and Aug. QST, p. 65), the following amateurs not previously reported have now been reported as having been active: W3A AMK DDX JHJ LM MXT TEO VEX VLF WDY. In the Waco tornado disaster (July QST, p. 46), we inadvertently neglected to mention the invaluable participation by W1BB, who was quite active.

The AERC gang in eastern Florida has set up a series of networks and established continuous monitoring service of designated frequencies in order that hurricane alerts might be disseminated immediately. This is called the Weather Amateur Radio Net (WARN). There are two c.w. net frequencies monitored: 7105 kc., for daylight hours, and 5180 kc., for the 11-meter daytime. The Gator Net meets on this frequency on Tuesdays, and 3675 kc. for night (where the Palmetto Net meets daily), W4YTM and W4DVR are NCS, respectively. The Florida Emergency Phone Net on 3910 kc. also establishes a 24-hour watch during any WARN alerts. Other nets participating are the Florida Phone Traffic Net, the Tropical Phone Traffic Net and the Novice Hurricane Net. Says W4TM, East Florida SEC, "We probably won't have any storms."
On April 9th, a "Gateways" test was run in the city of Philadelphia, Pa., to test communications between Philadelphia's four e.d. control centers and the eleven e.d. "Gateways." The only roads into the city that will be open in the event of a civil emergency. Members of the Phil-Mont Mobile Club turned out en masse, and some 30 amateurs participated, testing the line by driving their own mobile units on 29,693 kc. Several dozen test messages were sent from each control center to various gateways and vice versa. Much valuable data on radio conditions were learned, and a public meeting will be held — PHILLY, E. Philadelphia

Thirteen SEC reports representing 2861 AREC members were received covering July activity. New Mexico has entered the ranks of sections represented in the reports received this year, making the total 22.

TRAFFIC TOPICS

Our recent correspondence brought a note from an old-time traffic man to the effect that many of our QSO signals are a useless duplication of existing Q signals on the International List. He cited such as QNT and QRX, QNY and QNX, QNJ and QRQ, QNM and QRQ, QNF and QRQ, and QNJ and QNV. To this we might add 4 BB and QPB and QNX and QRT. If we use the meaning of the signals loosely, as most of us are wont to do, the point is well taken.

That's just the trouble — we use most of our Q signals loosely, as a matter of tradition. We use QRM for atmospheres, QMF for interference, QSO for contact, QSL for a piece of substitute without giving a second thought to the fact that these signals were coined to portray an abbreviation of an entire sentence, not just a single word. We'll continue to do this; it's too late for us to change our erroneous ways now, as regards international Q signals. But we traffic men are trying to lose the connotations on the Q signals; besides, there is not as much duplication as you might think.

While most of the above examples refer to the same general topic, the actual meanings are far different. For example, QRM is adding someone to an interfering, while QRM means I am being interfered with; QNB is a request to send a series of Vs, while QNV is requesting someone to request another one to send a series of Vs. All the QN signals have been carefully calculated to fulfill a net traffic need and are used only for that purpose. True, some of them aren't very often used, and through lack of use become almost unknown (e.g., QNA, QNN and QNV). Perhaps we could use QSY instead of QNT, and assign some other needed meaning to QVY and QNV. Suggestions would be welcome about the QN list — and since it's strictly an amateur list, we can change it any old time we want to.

But we ought to use it, and we ought to use it right. The other day we were sending a QNO on one of the net members, and took him completely by surprise. There was quite a pause while he fumbled in his desk drawers for his copy of the QN list. Do you know what it means? Besides knowing the meanings, we ought to know how to use them. For example, a lot of traffic men do not seem to realize that there are no question marks sent after QN signals. Where either meaning can apply, the way it is used and who uses it determines whether it is a question or statement. The signal QN used alone is asking "Who is NC6?" When followed by call letters, it is indicating the NCS, QNJ alone means "Can you copy me?" but when followed by a call it is asking if you can copy someone else, QNX used by the NCS is a direction, but when used by a net member it is a request. Similarly, QNQ. Many of our QN signals depend on circumstances for their meaning. The use of a question mark after any of them is never necessary.

We traffic men like our Q signals and want to stick by them, but only by using them right we do not gain maximum benefit from them.

K2BWP wonders if his son K2BWF, age 13 1/4 years, is the youngest so far in traffic. K2BWF had the highest traffic total (124) in the N.N.J. Section in June. Anybody younger has as good or better a total?

The Teen Axers' Net in July conducted 31 sessions for a traffic total of 223, an average of 7.2 per session. The best session accounted for 18 messages. We should also report that the Mission Trail Net handled 473 in 31 July sessions, averaging 15 per session, with a high of 35 for one session. Their July report was misfiled with net registrations.

National Traffic System. The latest NTS eaper is the Pacific Area Staff (PAS), now activated and in operation. The following are the NTS nets. Meet the members: WAFZ, Assistant TCC Manager for the Pacific Area, who has been elected Chairman; W8KIQ, Member-at-Large, who is Alternate Chairman; W8HIC, Member-at-Large, Secretary; W8TN, Pacific Area Net Manager; W8VC, Sixth Regional Net Manager; and W8PKX, Seventh Regional Net Manager. W6ELQ, who helped formulate the idea for PAS, is being drafted as a member and will probably (we hope) be sitting as the third member-at-large when you read this. The PAS is in effect a decentralization of NTS policy matters affecting the Pacific Area into the hands of Pacific Area traffic men. Its function is chiefly concerned with inter-net liaison arrangements, the aspect of NTS which makes it a system instead of a scattering of nets. It does not delve into intra-net functions except in an advisory capacity.

The members hold weekly meetings to discuss problems concerning the movement of traffic through Pacific Area NTS nets. Thus, no regional or area net manager's problems are his alone, and each manager becomes aware of and has an opportunity to assist with the problems of other net managers. If this experiment is successful (and there's no reason why it shouldn't be), we'll take steps to organize similar units in the Central and Eastern Areas. There is ample reason to believe that such decentralization could be of like benefit elsewhere.

August reports:

<table>
<thead>
<tr>
<th>Net</th>
<th>State</th>
<th>Top High</th>
<th>Constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1RN</td>
<td>21</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>3RN</td>
<td>34</td>
<td>12</td>
<td>3.6</td>
</tr>
<tr>
<td>4RN</td>
<td>29</td>
<td>13</td>
<td>8.2</td>
</tr>
<tr>
<td>5RN</td>
<td>45</td>
<td>38</td>
<td>5.8</td>
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<tr>
<td>6RN</td>
<td>10</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>8RN</td>
<td>26</td>
<td>116</td>
<td>100</td>
</tr>
<tr>
<td>9RN</td>
<td>210</td>
<td>194</td>
<td>25.2</td>
</tr>
<tr>
<td>10N</td>
<td>21</td>
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<tr>
<td>12N</td>
<td>225</td>
<td>61</td>
<td>25.0</td>
</tr>
<tr>
<td>CAN (July)</td>
<td>22</td>
<td>58</td>
<td>108</td>
</tr>
<tr>
<td>CAN</td>
<td>18</td>
<td>40</td>
<td>19.4</td>
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<tr>
<td>PAN</td>
<td>21</td>
<td>92</td>
<td>14.2</td>
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<tr>
<td>QIN (Ind.)</td>
<td>23</td>
<td>171</td>
<td>7.4</td>
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<tr>
<td>QKS (Kans.)</td>
<td>13</td>
<td>97</td>
<td>15.7</td>
</tr>
<tr>
<td>WSN (Wash.)</td>
<td>21</td>
<td>147</td>
<td>7.4</td>
</tr>
<tr>
<td>WSN (Wash.) (July)</td>
<td>23</td>
<td>175</td>
<td>7.6</td>
</tr>
<tr>
<td>8RN (Aug.)</td>
<td>390</td>
<td>276</td>
<td>106</td>
</tr>
<tr>
<td>14N (Aug.) (July)</td>
<td>37</td>
<td>380</td>
<td>14.0</td>
</tr>
</tbody>
</table>

Total 382
Record 383

* Out of 21 conducted.

Nine newcomers during August, sent up from section nets, are reported by 1RN — a very encouraging development. We need new blood. W3BIP is bowing out as 3RN manager because of his new SCM duties; 4RN returned to its regular operating schedule on September 1st. W4AKC has released a very fine statistical report of 4RN operation since November, 1952. W4DM and W4KXX have received 4RN certificates.

W0GJ has been awarded an RN certificate for his fine section representation and liaison work.

W5DSKX is proposing a change in time of 8KN in hope of getting more activity.

Certificates for 9RN have been issued to W6B RXD RNX RTF and W4PXX.

TRN is not sure it wants to be partitioned, but they're still considering.

W8UBP is the latest recipient of one of those armament EAN certificates.

8KIQ is holding up the liaison circuits into and out of Pacific almost single-handed and deserves a lot of credit. He has just received his PAN certificate.

WIAW OPERATING SCHEDULE

The Fall WIAW operating and general-contact schedule, effective September 27th, appeared over the air on the 7th of October. QST. See that issue for information on when and where to look for WIAW.

November 1953 73
Over a period of many years National Company has built thousands of communications receivers. A great deal of this equipment is still in use continually. Some of it, due to the habits of the ham, will collect dust for a few years, then will be dragged out and again put in use as activity is revived in some half-forgotten phase of his former one and only love.

We here in the National Company Service Department find the activities in ham radio quite unpredictable. Who can predict when the rig will again take the front seat to TV, or when 10 meters will again become active? For many years we have taken in for service almost anything that could be identified as being produced by us, regardless of age (with the exception of surplus gear), from “Rastus”, the dancing doll, to our more recent productions. We believe that this service has been appreciated and intend to continue the practice as much as scheduling will permit. However, in many instances, items are returned to us at the factory which should be processed by our Field Service Agencies. This results in a long delay and additional transportation expense to the individual as well as considerable delay in all other processing here at the plant.

In the past, all returned equipment has been accepted and processed, authorized or otherwise. We now find it necessary to request authorization for all returns in order that we may live up to promised schedules. We do not wish to flatly refuse unauthorized shipments, but such returned merchandise will take a back seat until such time as proper authorization and identification can be worked into our schedule. Therefore, in the future, we will require advance notice of any returns and will send authorization when such return is approved.

On the opposite page will be found a list of our present authorized service agencies and their locations throughout the country. These agencies are kept up-to-date with our latest methods of repair and revision, and in most instances are in a better position than we to expedite service with fewer shipping hazards and less expense. Only in rare instances are there service problems which cannot be adequately handled by our Field Service Agencies.

When shipping to any of our service centers, or to us, avoid rigid packing. Use plenty of corrugated cardboard to absorb vibration and jolts. Do not reuse damaged shipping material. Corrugated inserts and containers can take only so much abuse, after which they lose all spring and cushioning properties. The paint should be protected from the packing material by a waxed paper.

If at any time information is desired pertaining to servicing our equipment, please feel free to call upon us in the Service Department. Many times small bits of information can save hours of the needless toil that we all have experienced at one time or another.

Don Swain, Service Manager
Authorized Service Stations

CALIFORNIA
Communication Receiver Service
5016 Maplewood Avenue
Los Angeles, California
(Charles C. Messman)

The Robert Dollar Company
50 Drum Street
San Francisco, California

COLORADO
Murray Radio Company
9 West Vermijo Street
Colorado Springs, Colo.

FLORIDA
Electronic Engineering Assoc. of Fla.
3203 Flagler Avenue
Key West, Florida

Sam Long Communication Service
Albert Whitted Airport
St. Petersburg, Florida

Arthur H. Lynch
Post Office Box 466
Fort Myers, Florida

Rich Electronics, Inc.
206 Northwest 8th Avenue
Miami, Florida

ILLINOIS
G. E. Dammann Company
334 South Chase Avenue
Lombard, Illinois

INDIANA
Gibson TV Service
937 Lombard Drive
South Bend, Indiana

Harry J. Harris
1210 Home Avenue
Fort Wayne, Indiana

IOWA
Farnsworth Radio & Television
623 Jefferson Street
Waterloo, Iowa

KANSAS
Overton Electric Company
522 Jackson Street
Topeka, Kansas

MINNESOTA
Arrow Radio & Television Co.
125 East 1st Street
Duluth, Minnesota

Beacon Radio Service
130 East Fourth Street
St. Paul, Minnesota

Ecklen Radio Company
115 North 9th Street
Minneapolis, Minnesota

MISSOURI
Aircraft Radio Company
328 Richards Road
Kansas City, Missouri

Walter Ashe Radio Company
1125 Pine Street
St. Louis, Missouri

NEBRASKA
Radio Electronic Service
2862 Farnam
Omaha, Nebraska

NEW HAMPSHIRE
Evans Radio
10 Hills Avenue
Concord, New Hampshire

(Limited — Services only receivers they sell)

NEW YORK
Authorized Mfg. Service Co.
153 Spencer Street
Brooklyn, New York

SyracuseElectronics Corp.
691 South Salina Street
Syracuse, New York

Winters Radio Laboratory
11 Warren Street
New York, New York

OKLAHOMA
Mr. Arthur C. Nott
2314 South Oklahoma St.
Oklahoma City, Oklahoma

OREGON
2023 S. E. Sixth Avenue
Portland, Oregon

PENNSYLVANIA
Sentinel Laboratories
525 Arch Street
Philadelphia, Pennsylvania

TEXAS
Henry Binz
1312 N. Water
Corpus Christie, Texas

James T. Hunt Radio Service
602 North St. Paul Street
Dallas, Texas

UTAH
Morgan and Son
37 Kelsey Avenue
Salt Lake City, Utah

VIRGINIA
Lakeside Radio Service
5012 Lakeside Avenue
Richmond, Virginia

WASHINGTON
James V. Rollins
3245 East 100th
Seattle, Washington
ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, W. H. Wantz, WB3HB — SEC: IGW, RM; AXA: PAM; PYF: E. Pa., PDI, who was called into Uncle Sam’s here, is active and very helpful. On AN 1830, EPAEN 1900, EPA 1939, all EST. The monthly plaque of the Lancaster RST was held at Long Pond RST on September 15th. All ARRL amateurs and their friends are present. The main event was a 2-meter transmitter hunt won by NOI, followed by MFF and CWX, with GJA holding the transmitter. The debriefing was an illustrated talk by ARRL’s NC, George Hart, INJN, using the new ARRL AREC slides. UQJ reports a new radio club in Red Lion with VNR, press.; QCF, vice-pres.; WCT, gen.; and WGO farms. Meetings are held the first Tue. of each month. UDM and his XYL will be seen on 14.280 MHz this month. PMD will be in the Clearing House. Half the meetings of the radio club are there. The operation of the new ARRL AREC transmitters is an excellent idea. Is it possible that the entire section will support the new SCM and SEC.

With your help and cooperation we will be able to do a lot more this year. This is our duty to our members, to the many radio amateurs who work in the field of public service and who do not have a DRM call. It is our duty to the public. The club at WB9AT, on 20 and 70 meters, assists those who find it difficult to locate the station. QRM will be on 14.280 MHz this month.

SOUTHERN NEW JERSEY — SCM, Herbert T. Brooks, K2RB — SEC: UQJ. We are all grateful to Lloyd Brown, K2NY, for his work on the Eastern Shore Radio Club. We are very happy to know that the entire section will support the new SCM and SEC.

While your help and cooperation we will be able to do a lot more this year. This is our duty to our members, to the many radio amateurs who work in the field of public service and who do not have a DRM call. It is our duty to the public. The club at K2AA, on 20 and 70 meters, assists those who find it difficult to locate the station. QRM will be on 14.280 MHz this month.

SOUTHERN NEW YORK — SCM, Edward G. Graf, W3JTV — SEC: UTH, RM; RUF, PAM: GSS, NYS meets on 3615 kc. at 7:30 P.M. and 2980 kc. at 8:00 P.M. at NYSS 1255 kc. at 4:45 P.M. PYF 47, QRM 39, GES 50, AIL 15, XUL 21, AHA 9, SHR 8, VN 7, PY 5, CET 4, PDJ 4, AD 1, July: W3NOK 26, U1Q 19, U1Q 18, K1FR, K2AEI.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Arthur W. Plummer, W3EQK — VGY reports a plaque hunt in the territory of a 40-meter trans receiver. The contest was held on the Intra Baltimore Phone Net (IPN), which meets Tue. and Thurs. on 7210 kc. at 9:00 PST. New members who can handle traffic in Maryland and surrounding states are needed. VGY’s QTH is 1418, Bouldin St., Baltimore, Md.

The Antietam Radio Association of Hagerstown reports a very successful Field Day program with 8 full-time and 1 part-time operators using three transmitters with 8 full-time and 1 part-time operators using three transmitters with 8 full-time and 1 part-time operators. There are 2 4-meter, 2300 kc, 10-meter, 15-meter, 20-meter, 10-meter, 16-meter, 2-meter, and 70-meter mobiles in action. On August 20th the ARC held its second annual picnic at Carocan State Park in West Virginia with 40 participants. There were 17 hamas. QGY was getting ready for the AREC organized and a meeting was held to discuss E.C. activities. Applications for OES are expected from the Hagerstown AREC committee already has cleared satisfactorily its first TVI complaint. How about some of the Hagerstown gang activity? We think the Montgomery County and the Hagerstown AREC should be riding with them with their TVI troubles! CIQ says the Hagerstown boys are planning to move to MEQN and TCPN and he has been in contact with MIDD on 20 meters. The AREC members now report into MEQN and 3 into PRA. AREC meetings are held every other Tue.

The next one will be held at 9:00 P.M. for the purposes of the meetings. The Harrisburg District and the District of Columbia, since the new QTH, ZUM, ZQO, PQP, and GHI have been on for a few months now.

The report from the Northern Tier Radio Club, which is active on 14.280 MHz, is being made daily, W3FCN. The idea is to have a 2-meter FM repeater on 14.280 MHz.

CNYF is de-bugging new 918 ris. KN2CBL has a new NC-125 and Lettine 240. KN2KUHI, ENI, LTD, W3LHI, DPD, DPA, is again on the air. CNYF is on 14.280 MHz, D, C, K2D-KMJ is heard on 75 meters. VPS calls to TCPN. Nice cooperation, boys. QV on vacation in VES-Land and PMD on 3210 kc. on 75 meters. QO has been on for a few months now.

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new names: AEE, JZA, WNYYNX, and WNWZ. XIX is on 144 Mc, with W268 and a 5 x 5 antenna. GFL is calling 250C at 125 Mc, and UM's are building 144-Mc rigs. TKZ and S9G have new 75-meter mobiles. FAN, GFL, OPA, and 55 other v.h.f. enthusiasts attended a formal sponsored by RNS and TQ. DDG is heard 200 Mc, with an 852 final and thirty-element phased array. J2S, DSB, and GDW are back on 144 Mc, and NFT has a new receiver and big plane. The Illinois Club is the wonders of the Janus Club for the National Sports Car Race Aug. 25th, with the mobiles of OQ, KBB, KFR, LAV, LLI, SEC, JLE, QQT, VON, and KVL, and HSO on 28 Mc, assisted by on Q9 and W9YLR. KTT has a new RAI-55, VCM dropped the "C" from his call. W9AMS is now at Milwaukee, with HQ-120X and 75-watt 807 rig on 40 and 80 meters. The Annual Ground Hog Day Party was held at Watertown Sept. 13th. GFL was elected president, NLI secretary, and LEE treasurer of the Wisconsin Council of Clubs. MAREC has 144-Mc sets under construction. MADE 29 sets for the national contest. QM 170, M4V 125, R9P 84, SAA 83, LGR 77, ANM 30, GMY 29, V8R 29, KVJ 20, IQ9 19, CPF 9, RQM 7, HDV 4, OOF 3, OVO 2.

**DAKOTA DIVISION**

SOUTH DAKOTA — SCM: J. W. Siler, W9BRR. — Asst. SCM: Earl Shirley, W9YQR; Martha Shirley, W9WL. SEC: GCP, RMc: OLB, PAMC: UVI, and NJQ. The South Dakota 75-Meter Net is in full-time operation, with W9BRR as Net Manager. He has accepted FAM appointment. BLS, after a 15-year absence, is a new ONS. K9RCF again makes NPL with a total of 640. New calls at 25 Mc are Q9E, K9SA, QAP, and QPC. Q9QW is now W96M1, OVE is MARS director at Ellisburg, succeeding ORR, who has returned to W6-Land as a civilian. DK1Q has left Seattle to attend Ohio State University. The Prairie Dog ARC grew from the Sioux Falls ARC in the Field Day contest. W9NLWW, ex-Z9ADD, has dropped the "6". About 50 hams and their families attended a picnic at Redwood. The picnic committee consisted of Paul Fack, W9NEO, DGC, and OZB. K9V and former of Omaha, transferred to Aberdeen with the telephone company. It's a new daughter for CSD. L8R is attending School of Mines, after having worked 80 countries this summer. Traffic: K9F9C 820, W9Q9Q 46, IUH 6, L8B 4.

MINNESOTA — SCM: Charles M. Boye, W9XLC. — Asst. SCM: Vince Smythe, W9GQG; SEC: ZDU, RMc: DQ9L, PAMC: W6JC, and UCV. HU9 is building a mobile rig for operation this winter. DDG, QGFC, and Q9LG are building the Mobile Corps. If every EC signed up 8 new members this month it would make your SEC very happy. Sept. 1st was K9EAX's last day aboard ship on the Pacific and he is back in Bend to again. K9FJY is now running 450 watts to a pair of 812As. K9JG is assisting as NCS of the MJN. More members are needed, so all you Novice please call in. Through some error the MSIN has been listed in QST as operating on 3790 kc. This frequency is incorrect, 37900 kc should be 3905 kc. JU1A, KQ5L, and KQ6W worked the Easter Island DX Expedition, CE6BA. Traffic: W9F9A, W9S9Y 187, D9L 129, 945, V9C 82, W9W 82, QKX 82, SYN 82, G9Q 29, BYO 10, BUO 13, MB9 12, TJA 11, EMM 10, F9F 8, KN9 6, RA 3, OPA 2.

**DELTA DIVISION**

ARKANSAS — SCM: Fred E. Ward, W9LX. — Arkansas is now working on civil defense plans and all will want to take part in that, I'm sure. Contact your EC for instructions or, if no EC, the mayor or county judge. The Union County Amateur Radio Club sent me a copy of the new club paper, the Hot Wire, and it is sure a dandy. Wish more of the clubs would send me a copy of their publications. YHT has 9C-658 on 80 meters with 50 watts. The OZK Net opened Sept. 1st on 3095 kc, and all e.w. men are urged to attend the 7-8m. session, if possible. Several of the fellows have expressed an interest in an all-speed net, but when EA recently tried to start one, no one showed up. Guess the best thing we can do for the present is to encourage the slow-speed boys to take part in the OZK Net. Traffic: W9EAA 33.

LOUISIANA — SCM: Robert E. Barr, W9GIF. — MWE is handling the R95 Net and would like volunteers from the Baton Rouge, New Orleans, and Lake Charles Areas, as well as others. EB no longer has the TVF situation whittled to a frazzle. KG, CEW, and EB still are the DX leaders of the State, with other operators getting closer, new master, again is very active on 75 meters during the preschoold hours in the morning. The 1953 Delta Division Convention, held Sept. 5th and 6th at the Dung Hotel in New Orleans, far exceeded all expectations in becoming the greatest division convention ever staged, thanks to the combined efforts of the Greater New Orleans Radio Club and the Westside Radio Club. Total registration was 603, 388 of whom were licensed amateurs. League President Israel and Midwest Division Director Bill Schmitt, along with George Grammer and the Delta Division Direct.

(Continued on page 52)
Switch Common Power to several RF Transmitters with Mallory "Hamband" Switches

Mallory #1600 Series Rotary Switches, better known as "Hamband" switches, were designed especially for coil switching in high frequency transmitter service. However, the heavy, wide-spaced contacts, high quality ceramic insulation, and positive indexing which make these switches so desirable for use in transmitter plate circuits, also, give them exceptional capability for many other switching functions.

For example, the diagram above shows how a #164C (4 section "Hamband" switch), connected as a circuit changer, permits operation of two separate RF chassis from common power supplies and a single modulator. VHF operators in particular, who operate separate rigs above and below 50 megacycles, will recognize the economy and convenience this arrangement adds to such a station. With contact carrying ability of several hundred milliamperes, and with 1000 volt insulation, this switch is entirely adequate for transmitter powers up to 100 watts.

The circuit shown was devised by a dyed-in-the-wool VHF man to permit the addition of a low frequency RF unit to his existing VHF transmitter, and still use only the common power supplies and single modulator shown. However, there is no reason why a dyed-in-the-wool low frequency man couldn't make the change the other way 'round, and let the #164C switch help him explore the possibilities of VHF operation with a minimum expenditure of funds for new gear.

When using the #164C for this application, the usual high voltage wiring precautions should be observed, even though the exact circuit arrangement may be modified to suit individual requirements. The one shown has the indicator-lamp circuit located adjacent to the panel, the low voltage supply next, then the high voltage, and last the modulator transformer shorting section for CW operation. The physical location of the switch in relation to the power supplies, modulator and RF chassis is not important, and may be placed for maximum convenience. The circuit shown has the switch located within the modulator housing. Separate input and output sockets for each piece of equipment are mounted at the rear of the modulator.

The convenience and efficiency added by this circuit has been reported by its user to be most satisfying. Why don't you investigate the money saving possibilities Mallory rotary switches offer? Your Mallory distributor will be glad to help you select the right one.

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tor Jim Watkins, represented ARRL. Headquarters at the Convention, KFQG and B5BY were also in attendance. HHT, UX7Q, and DXDR are ECs in the Greater New York Areas. GLX and EVQ have been maintaining schedules for quite some time on 2 meters from Baton Rouge to Alexandria, a distance of approximately 100 miles. The 2-meter frequency has been kept in good use by the high-frequency boys. Stations in this area include KFXG, GLX, VFP, HCM, VLQ, TDY, TPK, OKJ, JBW, CW, and W5RNL. Thanks to GLX for this FB report on 2 meters.

TENNESSEE — SCM, Mark M. Bowelle, W4CFX/WLO — SEC: Njr. RM: AGC, PATM: QT; Phone net frequency: 3980 kc; U.w. net frequency: 3965 kc. This report is being written just before your SCM leaves on his vacation and before the monthly reports are in from the game, therefore some traffic totals may be included with next month's report. PL and VPI make HPL again this month easily. Two or more stations consistently making HPL throughout the summer months in a section the size of Tennessee is mighty fine going in anybody's league. By the time you read this the fall traffic season will have opened and the c.w. net will be back in full swing. From the way it looks now this may well be one of the best traffic seasons in the history of Tennessee. Both the phone and c.w. nets will be well populated with a fine bunch of traffic stations and that should assure quick delivery of all traffic headed our way. Most of you will have received the dope on the fall season in the station bulletin, CO Tennessee, by the time you read this. By the way, you are not on the mailing list for the bulletin and want to receive it, just drop your SCM a card with your QTH. Traffic: W4PLF 2222, VPI 1117.

GREAT LAKES DIVISION

KENTUCKY — SCM, Ivan C. Kelly, WE4TUT — At this writing the Kentucky gang still is in the summer coldframes and traffic still is down a few notches. There is a lot of ragchewing but little building and fixing. WD4EC is trying to get his mobile going between airborne military activities. CDJ is rebuilding from three finals to two under one shack. KZP has a new jr. operator now — the anywhere you can be is a clothesline. ASK is a new ham in Erlanger, W4N2ZL now has 24 stands, F4Z is 2-metering aeronautical mobile and rebuiding his fixed station. USDZ is going to high power modulation. YZe now has General Class license, SBI, a new EC. ORB, and OBS is preparing to give all nets a workout. WNH, now OBS and OBS and as an AREC member, is giving the band a hard time after school hours. UWA is working 40 meters and raising the bar more for college. OPY now is running K3WBG at 2400 W4NPK. Knox, W3GWT/4 is a member of the AREC. JUI stopped measuring frequencies long enough to take a trip to W6Land, URF holds OBS appointment. Traffic: (Aug.) W4FGV 599, W4C 396, B4X 39, W4A 39, K3WBG 28, W4SMT 27, YZB 39, TUP 39, NUX 21, B4X 17, N4Z 8, W4N2ZL 7, W4KZT 3, 6S4 2, (June) W4BAZ 110.

MICHIGAN — SCM, Fabian J. Meallister, W8HKT — ASS'T: SCM: Joe Selan, SCW: Bob Cooper, N8DQ: Mickey Wills, 8CPB: SEC: GJH. New appointees: OBS to NUL, OPS to FLM. The QRM Net commenced its winter schedule Oct. 5th, with UX2Y managing the 6-p.m. Net and URM handling the 7-p.m. session. The Br Net continues with sessions from 5:30 to 7 p.m. Mon. through Fri., MEN meets at 9 a.m. Sat. with J4J as NET. The UPEN at 10 a.m. Sun. is under NEJ. The gang at Mount Pleasant set up a portable station and information booth at the County Fair, and according to the local press, they scored the show. RTN reports approximately 21 hams took part in the Flint tornado rebuilding project. (Hence, that is!) IV finally got back on the day IVJY boasts a nice new 20-meter beam; we hear he topped it with a 10-meter job. J2X and FGB report activity on the Coast Guard Net. F3X is vacationing in the East, and we suspect he took the little 50-watt QNIN job along with him. The Saint Joe-Benton Harbor gang is working on a mass-production program for mobile rigs, with S8C in charge of the antenna problems. That's a big job, but TID is a big boy! SJF has been QRL calling and antenna work. It's no wonder they have company there during the winter months! HSG has been reporting regularly on the progress of the license-date business. Seems to still be some antagonism about it, but "Cos" still is there bailing it out. 4YW (ex-SNQ) sent his greetings to the Michigan via HSG. GJH reports the State RACES Plan has FODA approval, and now goes to E.C.C. Traffic: (Aug.) W3BQO 201, N4U 159, FLM 103, JYJ 66, TBP 32, NOH 69, FX 24, RTN 24, JX1 10, JYJ 15, AQA 14, IV 11, HSG 6, SCW 4, PUV 3, (July) W8NOH 83, YX4D 64.

OHIO — SCM, John E. Stinger, WA8JW — ASS'T: SCM: C. D. Hall, SPUN, and J. C. Erickson, SDAE. SEC: URB, RM: DAF, and PM, PM: PATM, FUF. New OBS appointees are J4RM, TLM, and IPX, while WB8P was made an OPS and GDK an OBS. No BPL cards were issued this month. MJA has moved from Cleveland to Cincinnati. From all accounts the Akron and Greater Hamfest held good turnouts. ANO and QMD worked (Continued on page 39).
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<tr>
<th>Parameter</th>
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<tr>
<td>D-C Plate Voltage</td>
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<td>D-C Screen Voltage</td>
<td>-150 volts</td>
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<td>D-C Plate Current</td>
<td>3.8 watts</td>
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<td>Plate Dissipation</td>
<td>375 watts</td>
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ZI.1 WW on 160-meter 'phone on Sept. 6th. DZO is trying out 40-meter ‘phone, OSD, the daughter of SFU, passed her General Class exam. WE's XYL took her Novice Class exam. RO is among those who would like to have a Great Lakes Division QSO Party, HNE, Lucas County EC, has been appointed Deputy Communications Director for Toledo and Lucas Counties. His sides are BN, YQR, and PNY. FJX is now DLXJX. AYJ, Cuyahoga County EC, has placed three hidden transmitters this fall, and 14P has won all of 'em. Any amateur finding him is not to be marked, or listed incorrectly. In the 1953 Summer Call Book, should advise HW 114 North Third St., Columbus, as the CARA is revising the list of Ohio amateurs to provide a new listing for the 1954 Call Letter License Plates. The Fremont gang is sponsoring the SVARC QSO Contest. A troop of 50 is being awarded the winner. Springfield's Q6 states that FPA is attending VHF School at Great Lakes and AYJ, C, E, W2ZL, supervised the obtaining of all communication units for the local fire department. The Queen City's Mike and Key announces they have 25 applicants for theirTue., confer. classes at 2416 Florence Ave. Time is 8:30 p.m. In addition IVE and HRR have been giving on-the-air lessons Tue. and Thurs. at 9:00 a.m. on 29,200 kc. A recipe for pepper relish graces the pages of Toledo's Shock News; however, hammy items relate of TWI joining the 2-meter gang and MGB endeavoring to do the same, while IVU now is on 160-meter vacation in Florida. TBW will be looking for U.S. contacts on 144 Mc. KB2AR has built the super-sensitive i.f. amplifier which appears in the 1953 Handbook and is very pleased with it. KB2ELD is the new call for Dutchess County c.d. KB2UI, RTE, EFU, and LHRB were awarded Section Net certificates for activity on NYSEPN. VDX was the guest speaker at the KVAW meeting recently. KB2BD is using a new off-center-fed antenna on 15 Mc. KB2UI has a new Elec. O. and is building a job铛 conduct a class for the Novices, also making a drive for parts. His object is to build elementary rigs for his graduates. Endomakers: PQI, KED, and LXP DC OC: NOC as OC, QGE, EC for Westchester, and YXLE. OC for Rochester, has conducted highly successful AREC-C tests in their counties. KB2UI is very active with K2 in Mahopac, LI is working mobile on 144 Mc, and is doing quite well. HEZ will attend Johns-Hopkins University. Bill is one of the very active O. His O. is a member of NYSEPN. Rest of luck to you, Bill, from the W6s. Traff. W2REV 61, W2GQ 61, W2INI 18, LERI 31, PBO 32, TYG 32, KB2UI 26.

NEW YORK CITY AND LONG ISLAND — SCMs, Clinton L. Coleman, W2PY, class, SCM, Harry Dannalis, 2TKU, SEC: ZA, RN: VJN, PAM: IXX; The Kings County AREC and RACES group has been revamped under the direction of KGN, the RTTY. With the assistance of IJG, MIHE, PXY, BSM, and the YUL, every key in the W2 and KB in Brooklyn was contacted. If anyone was overlooked, please contact KGN, AEP, Columbia University ARC (now an ARRL affiliated club) is in full swing with the phone and c.w. nets. AIP, the club repeater, reports a new bridge-limiter that is operating for the phone rig and a new RTTY project is under way. KSF has a 97-circuit 400 on the air and is building a new 2-meter rig. KBQ has been active with the Quezon AARC net on 2 meters.

(Continued on page 86)
For that custom rig...
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JOHNSON STEATITE SOCKETS
122-228 suited for low frequency or VHF, JOHNSON grade L4 steatite water sockets last for years. Brass steel spring contacts recessed to prevent movement. Countersunk rivets and bosed mounting holes permit sub-panel mounting. Locating grooves speed tube insertion. Available in 6, 5, 6, 7 and octal (illustrated).

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An outstanding line of swinging link Air Wound Inductors for amateur bands 140 thru 6 meters, 150, 500, 1000 watt sizes. Two inductance values for each band permits choice of appropriate C ratio dictated by amplifier plate voltage and plate current. Polystyrene insulation. Steatite bases and heavy wire sizes insure high efficiency. HCS-inductors match high voltage, low current tubes. LCS-inductors match low voltage, high current tubes.

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Ideal for use in low or medium power transmitters. Provides continuous tuning. 80 thru 10 meter bands with high Q throughout range. Variable pitch winding at No. 14 tinned copper wire. Maximum inductance 10 microhenries. Steatite end form. Positive rolling contact.

JOHNSON VARIABLE CAPACITORS
Providing high stability in tuned circuits, these representative types of JOHNSON variable capacitors are especially suited for amateur application. Steatite insulation and sturdy construction—functional design permits rapid and accurate assembly.

Type C and D. Unusually economical for quality condensers. .051” thick rounded aluminum plates. Large laminated rotor brushes. Air gap .080” to .250” (Type D) and .125” to .500” (Type C). Type D panel space, 4 5/8” W x 4” H. Type C, 5 1/8” x 5 1/8” H.

Type E and F. Rugged, compact units for low or medium power rigs. Aluminum plates .032” thick, rounded edges. Stainless steel shafts. Air gap from .045” to .125” (Type E) and .045” or .075” (Type F). Panel space, Type E, 2 5/8” square. Type F, 2 1/4” square.

Type L. Ideal for mobile application. Ceramic soldered—no eyelets or rivets. All brass, soldered construction. “Bright alloy” plated. Silver plated beryllium copper contact spring. Panel space only 1 1/4” square. Air gap .050”, .100”, .060” and .080” Butterfly, single and differential types.

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JOHNSON low-loss Steatite and porcelain insulators are rugged . . . performance prove through the years. Highly fracture resistant, dense molded and glazed for low moisture absorption. Available with DC-200 impregnation. Stable performance under adverse operating conditions. Extended creepage paths develop maximum voltage breakdown ratings, heavy integral mouting bases withstand heavy compression and lateral stress.

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Absolute dependability under the most rugged operating conditions is a prime requirement in all REL Multiplex Radio Telephony Systems. That's why you'll find CHICAGO "Sealed-in-Steel" transformers used throughout REL equipments. These world's toughest transformers are available in 3 mountings, each featuring one-piece seamless design enclosing an electronically perfect construction. Available for every application: Power, Bias, Filament, Filter Reactor, Audio, MIL-T-27, Stepdown. Ask for them at your electronic parts distributor.

Illustrated at right: REL 900 MC Transmitter, Series 707-757. Illustrated immediately above: REL Model 759 70 MC Dual Transmitters and Receivers. These systems make wide use of CHICAGO C-Type "Sealed-in-Steel" transformer units.

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With 10" color-coded leads brought out through fibre board base cover. Lead ends are stripped and timed for easy soldering. Flange-mounted unit.

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87
MIDWEST DIVISION

IOWA — SCM, William G. Davis, W6BP — Asst. SCM: Dr. A. J. Fogle, KBSC. While our SCM, W6BP, is stationed in the Kockles SCA will pinch-hit for him. During the two days of the Soldiers Reunion at Griswold the local hams had two portable stations in operation, KJN and KJM, with KRM, KRMX, KBAL, and MYN helping. Messages were sent to servicemen.

BDR has a new Braille writer and soon will have a kw. rig. The usual rice report was received from WCA, WCAE, and WCM, and is now moved to Wisconsin and his call now is W9AIL. NPF is a new TICL member. 81CB is now W9QEE at Burlington. AUL and PZO have new antennas. W9QF is a new Pleasant farm ham. W9PKS is a new Marshalltown ham. We hope that BDR will have the Tennessee Indians conquered. By mid-June the Iowa 72-meter Phone Net and TICL are doing a good job even when conditions are almost impossible at times. Keep up the good work. Thanks to those listed below for Pfizer traffic reports. This is election year again for director and vice-director. Cast your vote for the one you think has the best interest of amateur radio at heart, you will be sure to get your vote, but be sure to get your vote, too.

The Quad Cities Hamfest at Dodge City was highly successful and had the largest attendance of any this season with more than 800 registered. The Tri-Cities Hamfest at Dodge City was highly successful and had the largest attendance of any this season with more than 800 registered. Large prizes and a FB program highlighted the affair. Cars from Texas, Oklahoma, and Nebraska were seen on the scenic routes. UNW, of Waterloo, is now on 1400 as a new "phone net known as the Ham Butchers Net, which meets on 2800 kHz. Thu, and Thu 1200 as gaining members rapidly. UNW is NCS, FO, one of QW's two stations.

BDR, one of OQ's two stations, is moving to a new "phone net known as the Ham Butchers Net, which meets on 2705 kHz. Thu, and Thu 1200 as gaining members rapidly. UNW is NCS, FO, one of QW's two stations.

An IRC Q Control, one or more IRC Multisections, and you can assemble your own standard dual, triple, or even quadropole control—just a few minutes and at rock-bottom cost.

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Iowa — SCM, William G. Davis, W6BP — Asst.

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City: _____________________________ Zone: ______ State: ______

(Continued on page 90)
Heathkit TRANSMITTER KIT

MODEL AT-1

Single knob band switching
Pre-wound coils — metered operation
52 ohm coiled output
Built-in power supply

$29.50

SHIPPING WT. 16 LBS.

Rugged, clean construction
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Here is the latest Heathkit addition to the Ham Radio field, the AT-1 Transmitter Kit incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, standby switch, key click filter, AC line filtering, good shielding, etc. VFO or crystal excitation up to 35 watts input. Built-in power supply provides 425V @ 100MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis and detailed construction manual. (Crystal not supplied.)

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Four band operation 535KC to 35MC
Electrical band spread and scale
RF gain control with AVC or SVC
Stable IF and oscillators circuit
Noise limiter — standby switch
51/2" PM speaker — headphone jack

Range............535KC to 35MC
1250 kc.............Detector oscillator
1245 kc.............AM oscillator
1255 kc.............Mixer oscillator
1250 kc.............IF amplifiers
1245 kc.............Detector — AVC — Audio
1255 kc.............Audio — Rectifier
1250 kc.............Rectifier
100-105 watts volts AC 60/60 cycles
4d watts

MODEL AR-2

$25.50

SHIP. WT. 12 LBS.

CABINET

Pre-assembled, wood, covered plywood cabinet, Shipp. Wt. 5 lbs. No. 91-10. $4.50

THE IMPROVED Heathkit GRID DIP METER KIT

• Pre-wound coil kit
• Range — 2MC to 250MC
• Meter sensitivity control

Pre-wound coil kit
Compact one hand operation
Headphone monitoring jack
Transformer operated

Model GD-1A

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SHIP. WT. 4 LBS.

Two additional plug-in coils are available and provide continuous extension of low frequency coverage down to 55KC. Dial calibration curve included. Shipp. Wt. 1 lb.

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$3.00
EASTERN MASSACHUSETTS — SCM, Frank L. Baker Jr., W1JAP, VE1S is the new Route Manager for the 40-meter, ex-AOL, appointments. EORC's amateur Club has been in the Baker family for over 30 years. The name is now being used by W1JAP, the new manager, for a new Club. The new name is the Baker family's best-kept secret. W1JAP is the new manager of the Amateur Club. The new name is the Baker family's best-kept secret. W1JAP is the new manager of the Amateur Club. The new name is the Baker family's best-kept secret. W1JAP is the new manager of the Amateur Club. The new name is the Baker family's best-kept secret. W1JAP is the new manager of the Amateur Club. The new name is the Baker family's best-kept secret. W1JAP is the new manager of the Amateur Club. The new name is the Baker family's best-kept secret. W1JAP is the new manager of the Amateur Club. The new name is the Baker family's best-kept secret. W1JAP is the new manager of the Amateur Club. 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plays a definite part in the excellent dollar value represented in the price of a Super-Six Converter.

Skillful engineering is responsible for exclusive Gonset circuitry that makes it possible to reduce the number of components required for optimum converter performance. Savings are effected since Super-Six requires less components to do a given job. These savings permit the use of more expensive, higher quality components with extra safety margins.

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mobile. UBC is going to Worcester Polytechnic Inst. and has been on 20-meter e.g. PJ, NW0, and VCG are new grandfathers. The Wellesley Amateur Radio Society has ten new Gonset Communicators for its net and a Lafayette 3006-6-meter ground-plane antenna and a 500 watt power supply. JYY, who is in charge of the National Guard Communications Plan, writes that equipment has been issued to 25 numbers in this State. The Eastern Amateur Radio Assn. held a meeting at d. e. headquarters and will resume regular meetings the 2nd and 4th Thurs. at the New Bedford YMCA. Anyone is welcome. Anne H. Johnson is secretary of the New Bedford C.C. office, has been very cooperative with the local amateur group, BTL visited the Club, W7Y has a new Viking W2N on 300 kHz, on 10 meters. CTZ is working on mobile rig on 10 meters. "Jim/11" lives in New Bedford now. LLY is going mobile in his new car, AVY is in his radio traffic center at the station. AGM got his operator license back again. HPP put his THV-500 in the car with a super duper dynamotor, he's been to a trip to the Catskill Mountains. APY is mobile on 10 meters. KKV is building a k.w. rig. AGG got his old call back and is on 10 meters. ME has an Elmsford 3 meter transmitter and an alternator power supply. UPZ is busy in MARS net, WAG worked KP4ZP on 80 meters. TQS says 5C0E is to live in Provincetown for good. BL made WAG on 160 meters, first on record. He worked ZL36R and ZC6td for Oceania. OLP has a radio control (6 meters) on his model train. Traffic keeper in New Hampshire in ON77, YQF 56, EMG 47, WAG 29, UHT 19, TQS 12, OTR 5, BI 6, QON 5, WU 6, TV2-1.

WESTERN MASSACHUSETTS — Roger E. Corey, W1JYH — SEC: KUE, RM: BVR, PAM: RDR, WMN meets at 7 p.m. Mon. through Fri. on 3570 kHz, HRV and TV2 renewed their OBS agreement. How many do you think are not? YCQ/3 is up to 42 states and hopes to make WAS before returning to school at Amherst. BCG, LRL, SHT, FSH, PIR, OJQ, AING, and YQH has a new station. Free Day on Sweetman M.T. operating on 2, 6, and 10 meters with emergency power. LPT is the section's latest a.m. converter, with FYH to follow shortly. Traffic is on 100 watts, TRF in traffic again and has a new BC-312 which should help him go even higher. KPY worked CE2A with 35 watts and no QSO. HRV has built a new garage and moved the KFY equipment so as to interfere with the fall traffic season. RPT is on a.m. from Monterey. OGY and KXJ at building parallel 813 finals for the fall season, while BGE and Barstow (former parallel) 41225a for his. YE6W is the new call of the Worthington e.d. station. AVE is back from Poland and now operates in Europe. ARA has a new Viking II. The HCRC is sponsoring a monthly QSO contest for its members; a good example of what clubs can do. This is a typical event. WITVY 858, UKE 72, BVR 45, HLY 19, SEP 10, JYH 9. MYP 6, OQH 7.

NEW HAMPSHIRE — SCM, Carroll A. Currier, W1JH — SEC: BXU, RM: CRW, PAM: UNY. Because of the serious illness of our SCM, GM1, this report has been written by CRW to bring you the latest news from New Hampshire. QNY and KXJ are now settled in Long Beach, California. NHTN is now on 3860 kHz, at 1 p.m. NHTN is now on Mon. through Fri. on 3885 kHz. NVTZ is on 3880 kHz, operating on either of these nets. WLR is doing a good job from Keene. SAL is a famous fisherman. QKU is back in New York after his winter in Snowville. QFX, PQR and GQI are very consistent on NHH. BGT is on 20 meters with a Viking III. Traffic: WICR 165, ZET 27, QCI 21, CDX 11, QX 7.

RHODE ISLAND — SCM, Merrill D. Randall, W1JBB — SEC: MJZ, RM: BTV, RNT went on its every-day 7 a.m. schedule on Sept. 14th. Contact TVL for a place on the new net. In particular, you fellows who recently acquired your General Class tickets are invited. R. I. ed. meets every Sun. at 10 a.m. on 3860 kHz. If you have a very good QSL, join the new Sunday R. I. Phone Net at 11 a.m. on 1860 kHz. June Burkett, VXG, 24 Roger Williams Ave., Rumford, R. I. wants to get as many R. I. QSLs as possible into a YL net. Write to her and get the dope, gas and listen for her on 75 or 10 meters. W5CQ's proxy, took 18 of Newport's members to PRA's Sept. 1st meeting, thereby giving PRA a chance to get revenue for the auction which NRC canceled at W5CQ's expense several meetings earlier. Now that it looks as if the fall season is on us in earnest, we are pushing plans for an R. I. Amateur Council similar to the one which performed yeoman service a couple of years ago. We would like your comments — particularly about license plates. Traffic: W1VXC 34, OIK 13.

VERMONT — Acting SCM, Robert L. Scott, W1RNA SEC: NLO, PAM: AXN, RM: OAR, FPC appointed RNA as Acting SCM Aug. 25th until his term officially begins. Ray is to be congratulated on his FB work as SCM. The c.w./phone family picnic, held at Groton State Forest, was attended by 78 persons. Two transmitters, operating from 2.5-kw. generator, on 75- and 10-meter phone, were operated as K00-1 from the picnic area. VTN resumed fall and winter kiting Sept. 14th. Traffic through Fri. and hours, 3520 kW., with J1Z, VZG, TAN, and VTP NCS, respectively. OAR was visited by BVE and his mother. The first edition of Maple Sugar RF has just been issued as a combined c.w./phone monthly bulletin. Essex County

(Continued on page 92)
YES O.M. I JUST BOUGHT A NEW B&W FILTER TOO, AND I'M BACK ON THE AIR WITH NO TVI

AND DEAR, HAVE YOU EVER SEEN OUR SCREEN SO CLEAR

on the air anytime
with no HOT air from your neighbor

new B&W
low pass filter

big features
to help you
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- Extremely high attenuation ratios.
- Four "K" sections, plus two "M" derived end sections.
- Insertion loss less than .25 db thru entire pass band to 30 mc.
- Handles more than 1 KW of r-f power.
- Highest grade electrical Teflon insulation.
- All copper construction.
- Amazing in performance, small in size, low in cost.

The Wave Guide principle employed in the design of these new B & W Low Pass Filters has permitted a novel type of multi-section construction. The simplicity and compactness of this new mechanical construction allows more sections to be built in less space than normally and, as a result, an extremely high order of attenuation is accomplished.

The attenuation achieved in the new B & W Filters is a minimum of 85 db throughout the TV band and more than 100 db on TV channel #2.

With a minimum voltage attenuation ratio of 17,780 to 1—the equivalent of 85 db—the second harmonic voltage output from a 1 KW transmitter, equipped with these new B & W high performance filters, will be reduced to approximately 1.1 volts or 110 microvolts.

These calculations are based on a 1 KW input at 75% efficiency and an output load equal to an impedance of 50 ohms.

Laboratory power test runs, under conditions of feed line mismatch within the normal expectancy limit, disclosed these units capable of continuously handling more than 1 KW of modulated r-f power with ease.

In all applications including AM, FM, CW, FS, RTTY, and SSB service, the mighty performance of these new B & W Low Pass Filters will prove to be a substantial aid in overcoming TVI caused by harmonic radiation.

Model 425: 52 ohms Impedance  •  Model 426: 75 ohms Impedance

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237 Fairfield Ave., Upper Darby, Pa.
now is on the ham map, with YEL, its one and only native station at Island Pond.
"The proof of the pudding is in the eating." The proof of Eldico's TR-1 TV Transmitter is to listen on the amateur bands during television hours, listen to the S9 signal and you will find TR-1 TV's in operation. Or sample the Eldico mailbag and you will read of happy amateurs now operating without television interference, and complimenting Eldico on quality of components, ease of construction and the fine appearance of the TR-1 TV transmitter.

The unsolicited letter on the right is proof. Other names and calls are available on request.

Gentlemen: Have received my TR-1 TV Exciter/Transmitter recently and wired it up in several days. The first evening that I had it on the air I contacted several South American and European DX stations with good reports and have worked many more since. The big thrill strangely enough was not the DX contacts but the fact that I was again operating while my two TV sets are operating without a trace of TVI.

You might be interested in knowing why I choose the TR-1 TV over the several kits available on the 100 watt class. First, for less money I am able to use several times the power both on phone and cw and with a tube that is not being pushed to its limit to produce its advertised output. In addition I am able to continue to use my entire transmitter less the RF section which I feel is a feature that is bound to sell many units for you. Please accept my thanks and appreciation for being thoughtful enough of the Ham's pocketbook to make this available. I am sure that the rapid bandswitching feature and the smooth operating Pi Network will be a pleasure to use in the coming Sweepstakes Contest. If you wish you may use this letter; it is little enough to offer in return for the great pioneering work you have performed for the hams in tiding the TVI problem.

Very truly, M. R. GUTMAN, W2VL-AP2VL.

300 watts AM Phone or CW; Band switching 80-40-20-15-10 meters; Complete shielded tetrode final; Each circuit metered—will fit standard 19" rack panel cabinet; Pi Network Output—Built-in Low Pass Filter. Remember, Operate your own rig—TVI Proofed.* See your distributor today.

*TVI-proofed means special circuitry, shielding, and filtering to eliminate spurious and harmonic energies that result in television interference.
PACIFIC DIVISION

HAWAII — SCM, James K. Knauf, KH6KS — The HARC Convention of Aug. 15th was a success in every sense of the word from all reports. However, because of official business on Guam the SCM did not attend but mailed in visits to KG6FIA, KG6ACS, KG6ADY, and KG6AEX (ex-KF6A) and to spend a few minutes with KI6ACK/K6GK (ex-W6YIG), who was nursing Navy wounds at WRIC, Jalein. Only three stations reported for August. I don't want to slight anyone and am equally certain that a great many of you were as mixed up as the new SCM on this ill-reported matter, so please all of you, especially FEARL, try to beat the deadline by a day or two and I will try to maintain the standard by any means necessary, KI6ACK. Traffic: (Aug.) KA7JLF 5524, KH6AJF 1286, KAJ6K 722, (July) KG6FIA 581, KA7JLF 4392, KH6AJF 1065, (June) KG6FIA 915, KA7JLF 1415, KG6AJF 1076, (May) KH6AJF 762.

SANTA CLARA VALLEY — SCM, Roy I. Cousin, W6ZF — Field Day is over but the memories linger on as the clubs are amassing scores to see who in the area will be the proud holder of the plaque offered by the Central California Radio Council. The SCCARA is preparing an exhibit for the Santa Clara County Fair, LZL is the exhibit chairman. AEV, the SEC, reports that the north end of the section seems dormant as there is too much area for one EC, so reorganization is in order to relieve QRE, who is doing a swell job under the handicap. We're real sorry to get the report that Louis Pieri, ex-W6DK, was killed in an air accident. KFG still is busy in his home QTH where he has his transmitting tube factory and rebuilding b.o. station tubes. He has very little time to get on the air, but plans are in the offing and rigs will appear in the not-too-distant future. NTQ has moved into a new garage. MMG is back from his annual trip to WI-LAND and is encamped at Dayton, Ohio. He is a volunteer for ZWA and now is stationed in Detroit, where he is a former K8QG. MMG got his younger brother interested in ham radio. HC is especially busy with college work so will have to confine his efforts to Net Control to two nights a week. Harry was elected secretary of the Pacific Area Staff, and is a candidate for vice-director of the Pacific Division. Traffic: (Aug.) W6OFJ 1487, HC 290, AIT 2, MMG 2, (July) W6OFJ 1333.

FAST BAY — SCM, Ray H. Cornell, W6JZ — Asst. SCM: Gene Black, 6K1B; Herb C. Cameron, 6R1R; SEC: WGM, RM1: IPW, JOH; PAM: LTL, EGA: AKB, CAN, CN, DXN, FLT, NNS, QDE, TCU. A section meeting was held at the Albany City Hall on Aug. 28th to discuss fall activities. JDD gave an impressive demonstration of transistors to the ERBC at the September meeting. VEY and MXX demonstrated some new techniques to the SARO. TheSo. Alameda County C.D. gang covered a "Block Disaster" in Castro Valley on Sept. 15th. Why don't you join in the fun at SARO meetings? The KBBM gang would like to have any spare junk parts for a beginners' class. Capt. Walt Hunter, custodian of K6FAL, was lost in the recent B-36 crash in the Atlantic while flying for the Navy, as a great shock to his many friends in this section. ATN runs a code and theory class at Vallejo Evening College. K6NBAS retransmits the Mon. night code transmissions of JZ and Friday night code transmissions of LZ at 1800. K6FAL has a BPL card for every month this year and hopes to make it a clean sweep. YDI is well settled in his new QTH at Martinez. RLB has returned from his Eastern vacation feeling fit, fat, and thirty. CX, QSR, JIG, JZ, LYL, NYH, PAV, YPR, ZJX, ZLN, and ZRH are Army MAARS affiliates. Heard on 75-meter s.s.b.: US, YFA, RPR, QZ6, TT, PVH, and PAQ. The New officers of the Northern California DX Club are JZ, PZ, LOR, and YDI QNI MTN regularly. SACC has a visit from KH100H, and W6PK, K6X, ELW, and UZ2, SACC reports regular QSOs with HI2AA, HX6K, JQ, W6DQ, and LTI worked ZL2A on s.s.b., on 1710 kc, when the band apparently was dead. BXE worked ZL2LY on 75 meters along with W6PM and U6Q. W1XK, W7RQ, W6QF, and NHT are all General Class now. W1R and QEN have Viking Lic. TLZ is attending U.C. Active members in the Contra Costa area are MZ7, HMQ, HDM, HPI, and HHM. Traffic: K6FAL 911, W6LPW 127, JOH 79, JZ 55, YDI 2.

SAN FRANCISCO — SCM, R. F. Counkowitz, W5ATO — SEC: N1L; Phone: PH 4-830. SCM of the new SCM of this section, the well-known and well-liked Walter Buckley, W6GQG, who was elected on an unopposed nomination. Please give him full cooperation and try all, send in news of your club and individual doings. This (Continued on page 86)
for Peak Performance...

INSIST ON...

OHMITE® DEPENDABILITY

VITREOUS ENAMELED RHEOSTATS
10 Sizes, 25 to 1000 watts. Ceramic and metal construction; metal-graphite brush.

BROWN DEVIL® FIXED RESISTORS
Small sizes—5, 10, and 20 watts. Five larger sizes to 200 watts.

DUMMY ANTENNA RESISTORS
Practically non-reactive within recommended range, 100-250 Watts. 52-600 Ohms.

FREQUENCY-RATED PLATE CHOKES
It's easy to select the right unit for all frequencies. Seven sizes, 3 to 520 mc.

DIVIDOHM® ADJUSTABLE RESISTORS
Wire-wound, vitreous-enamelled. Adjustable lugs. Seven sizes—10 to 200 watts.

LITTLE DEVIL® COMPOSITION RESISTORS
Tiny, rugged, insulated units, clearly marked for resistance and wattage, 1/2, 1, and 2 Watts.

Be Right With...

OHMITE
RHEOSTATS • RESISTORS • TAP SWITCHES

WRITE FOR STOCK CATALOG

OHMITE MANUFACTURING CO.
3636 W. Howard St.
Skokie, Ill.
(Suburb of Chicago)
is my last report as SCM and I wish to extend thanks to all the many friends, from San Francisco to Englewood, beyond the bounds of this section, who have helped to make the job efficient and enjoyable. My term actually expired in April of 1952, but in the absence of nominations for others, I agreed to continue the work on an interim basis, and have done so up to the present four years. In Wally, your new SCM, lives at 30 Colonial Way, San Francisco, and can be reached at Juniper 7-4002. He is active on the Mission Trail Net and his radio shack is impressively filled with equipment. Congratulations to SWP, who again has come through for a Brass Pounding License certificate with a traffic total of 604 for August.

Put is our most reliable and consistent ORS. He recently checked in on Jr2V, K6E, BAN, PAN, and occasionally on Jr11, SBR, and K7F. CW, VHF, and Mars traffic are handled Mars traffic, J1FL, presenty signing up DIAAY, who reports that he wishes he were on Golden Gate Heights in San Francisco area. He is now employed with 002d AC&W Smld., APO 34, New York, UNF is back on the air with a 250-watt dual. An Emergency Corps 2-meter net has been completed from Corner of 7th and Colorado, to San Diego, and with CEP, as NOS, recently handled a message from San Francisco to San Diego and received a reply in the next hour—2 meters all the way, and to be split at Sonoma, to Fresno, to Bakersfield, to Taft, to Los Angeles, to San Diego, where WYR received and replied, and GD and others handled for 60,800 phone. They are now working on the extension of the net to the northward, but at present cannot handle beyond Sacramento. Their longer range plan is all the way to the East Coast. The Marin Radio Club, with the assistance of Tamarac Club members OZK and MUN, as well as NTV, handles the radio broadcasting of the Marin County Fair and Home Show at San Rafael, using a Viking li, an HRM 20X, and a 75-75 75-meter phone, which received a call from 20X, and on the air. DXM was sold out in the San Benito County Radio Club at San Benito, using a Viking I, li, an HRM 20X, and a 7-ups 75-meter phone, which received a call from 20X, and on the air. DXM was sold out in the San Benito County Radio Club at San Benito, using a Viking I, li, an HRM 20X, and a 7-ups 75-meter phone, which received a call from 20X, and on the air. DXM was sold out in the San Benito County Radio Club at San Benito, using a Viking I, li, an HRM 20X, and a 7-ups 75-meter phone, which received a call from 20X, and on the air. DXM was sold out in the San Benito County Radio Club at San Benito, using a Viking I, li, an HRM 20X, and a 7-ups 75-meter phone, which received a call from 20X, and on the air. 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Right for the Job!

New DELCO-REMY ALTERNATING CURRENT GENERATOR (ALTERNATOR)

A.C. - D.C. charging system for vehicles with extra-heavy electrical loads

Here's the answer for "problem" vehicles—Delco-Remy's new long-lived A.C.-D.C. charging system! It's specifically designed to meet the extra-heavy electrical demands of police prowl cars, big city taxis, and other vehicles equipped with two-way radio, floodlights or any extra electrical units... ample current reserve picks up discharged battery quickly in operation.

With output ranging from 30-40 amperes at curb idle to 90 amperes at higher engine speeds, the new Delco-Remy A.C.-D.C. charging system meets all electrical needs under the toughest operating conditions. Included in the new system is the A.C. generator (alternator), a matching regulator for accurate voltage control and a rugged, dependable dry-plate rectifier which converts generator A.C. output to direct current.

Application packages for popular makes of cars and trucks are now available. The conversion job is simple, complete and profitable. For further details and for application data, call on your nearest United Motors distributor.

DELCO-REMY
Division, General Motors Corporation
Anderson, Indiana

WHEREVER WHEELS TURN OR PROPELLERS SPIN
A lively horse

needs a good wagon!

... just as your converter needs a better receiver
than your car radio behind it, a unit designed specifically
for communications. You can bet that every mobile ham
will choose the new MORROW FTR.

The quality-manufacturing techniques that are found in
the famous MORROW CONVERTERS are used in production
of this new, fixed frequency, crystal-controlled receiver.
When used with a MORROW CONVERTER, or with any
other good converter, the FTR completes in itself that will
give top communications receiver performance with
sufficient stability for SSB reception.

Advanced Features: Mixer, xtal-controlled oscillator,
feeding a very selective 200 kc. IF amplifier; diode de-
tector to MORROW Noise Limiter and MORROW Noise
Balanced Squelch Circuits; three stages of audio affording
ampleundistorted speaker output; hermetically sealed
meter used as an S meter, or as a field-strength meter
in tuning transmitter to maximum output.

Two 4-position rotary controls on panel. Control No. 1:
First position, Off; second pos., Filaments On; third pos.,
8 plus On; fourth pos., Noise Limiter On. Control No. 2:
First pos., AVC Off and S Meter in circuit; second pos.,
AVC Off and S Meter in circuit; third pos.,
AVC Off, BFO On, S Meter out of circuit; fourth pos.,
Meter as Field Strength Meter.

Power Supply relay controlled with external terminals
for quieting receiver when transmitting, 10 tubes—15 tube
circuit. Performance Case matches MORROW Converters:
H—4.5”, W—53” D—8 5/8”. Complete Power Supply
in separate case and connecting cables. Furnished for
1525 kc. input; other input frequencies optional.

Hall Annex. The City of Bakersfield has installed a 100-foot
antenna pole for the Club and they plan a kw, on all bands.
The KCRU also reports their pot-luck picnic held on the
30th was such a big success they plan a similar
annual affair. The Stockton Club held its annual picnic
at Calaveras Big Trees recently. The Merced Amateur
Radio Club furnished communications for a parade
at the Merced County Fair Parade at Merced on Aug.
29th. OHB/Al was in charge of operations and mobile units
participating were SQR, ZVA, BUA, GW, N6D, ZVA

ROANOKE DIVISION

NORTH CAROLINA — SCM, J. C. Geaslen, W4DLX — to all the North Carolina stations who took part in Hurricane Watch on the night of Aug. 18, 1944. Let me say that "well done." The Tar Heel Net was alerted early in the evening and with CVQ, at Raleigh, as NCB a fine job was done throughout the night. Stations netted extended to the following stations: In the storm area: S6S at New Bern, on emergency power at Airport; MDC, MFI, and LCF/MB; in the Elkins City the Club and
NY, Wilmington; RSF, Jacksonville; LR, Washington; YKJ, Aurora. Out of the storm area stations are: ANU, Raleigh; QDA and PZL, Shelby; W3S, Hickory; TLA, at Rocky Mt.; PIF, Morganton; YPI, Winston-Salem; S6G, Fayetteville; and 8EM, Goldsboro. Those interested in s.w. traffic, should check in with ARC, There are now six more 75-meter mobiles in Charlotte, S6G, to date, has 200 mobile stations in her log. Traffic: W4AKC 199, VHI 21, DLX 8.

SOUTH CAROLINA — SCM, T. Hunter Wood, WNF — New officer of the Naval Base Radio Net are: IAIUD, pres.; IDOW and new officer of the Palmetto Radio Club; TFL, pres.; BLF, vice-pres.; BXI, secre-
tary; BCF and UVZ, directors. Activities include the
Atlanta Hamfest and expects to be on 75-meter mobile
soon. BNN expects to be on 75 meters from Dillon soon.
The Charleston Club will have the Clement Chess
Club in a tournament scheduled for Oct. 28th, with FFH
and NOX as the opponents. USLH is now on mobile from Florence. In the following months the S. C. Mobile Roundup at 1330 Sundays during August:
ANK, ABW, PZL, DX, du BB, WQZ, SQR, ZQP, S5Q, S6G, TBE, TWZ, UFZ, ULH and ZYY, ILQ has a telephone hole on
which he is installing a 20-meter beam. DXX is getting
excellent results with his 2-meter mobile station.
ERS, the mobile club, plans to have a turnout of
75 meters. BIJL has built a shack in his back yard and is
at last able to take his old mobile and newly released from the Air Force, he has his emergency
ready. The South Carolina W.W. Net meets on the 1st,
Mon. through Fri. on 3525 kc. and all s.w. stations
are invited to attend. Traffic: W4FFH 104, ANK 49,
PP, TQT 4.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF —
Before leaving for college ZFV made a very good summer
reception with area, regional, teachers and parents. ZFV
will be unable to be as active as usual because business
takes him out of town quite frequently. The duties of
NCB on Sunday evening therefore will be handled by UVZ,
whose attendance and punctuality has always been 100 per
cent. FF has moved from Virginia and is ineligible to
continue as SCM. The new W6H is Dale, Md., 20 miles
south of Annapolis on the Chesapeake. Retirement from
active every-day work requiring complete rest because of
a heart condition foreced the change. Dale will be
uninhabited both receiver and transmitter. 6FMZ/4, ex-
cept 7EL, 7ELF, and 6FMZ/CB, now resides at Norfolk and
sports the latest ORS appointment. W4GAC is another
graduate from SVCARS efforts to foster the VICAR
instructional classes. Let's give more of the same. Virginia sure
has profited from that type of activity. The next step
being to team with former VICARS who are away out in
front of those old-timers in QN, W4B, and W4E, and the
son of YG, former SCM of Alabama and Georgia,
recently was graduated from the VICAR ranks and is the
prize possessor of 25-w.p.m. certificate as well as OBS
and ORS appointments. KI6HRB, prominent Honolulu
ham DXer, visited with VICARS. Time in on 3080 kc.
each Fri., 2900 hours for special bulletin and information
transmitted via 418N and occasionally by LW and\nBVY/4. WBC and VOZ have ventured on 40-meter phone with grumpsters (?) Traffic: W4LX 29, RJW 97, JAV 76,
LNX 59, KX 53, BIJL 46, TEZ 28, JA/23, CH 20, CFW 17, LME 14, TVC 11, HBF 12, UWS 11,
LOWA 5, W8GF 9, W4FZG 5.

(Continued on page 108)
Bliley FOR 23 YEARS
...the dependable source for AMATEUR CRYSTALS

Famous BLILEY "PACKAGED" OSCILLATOR
FOR 2.6-10-11 METERS

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**AMATEUR FREQUENCIES • CRYSTAL FILTERS • STANDARD FREQUENCIES**

<table>
<thead>
<tr>
<th>CODE</th>
<th>TYPE</th>
<th>APPLICATION</th>
<th>TOLERANCE</th>
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<tr>
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<td>KV3</td>
<td>reference frequency 100 kc</td>
<td>±0.005%</td>
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<td>811</td>
<td>MS433</td>
<td>reference frequency 1000 kc</td>
<td>±0.005%</td>
<td>17.00</td>
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<td>813</td>
<td>MCP</td>
<td>13.6275 mc (multiplier to 27.255 mc) CRESTENS RADIO SERVICE (CLASS &quot;C&quot;)</td>
<td>±0.04%</td>
<td>6.30</td>
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<td>814</td>
<td>CF3</td>
<td>445.8-456 kc-455 kc Single Segue Filter</td>
<td>±0.5 fc</td>
<td>5.00</td>
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<td>CF6</td>
<td>1355 mc-1365 kc-1355 kc Single Segue Filter</td>
<td>±0.5 kc</td>
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**AMATEUR FREQUENCIES AND PACKAGED OSCILLATORS**

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<tr>
<td>816</td>
<td>CCO-2A</td>
<td>packaged oscillator for 2.6-10-11 meters</td>
<td>11.95</td>
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<tr>
<td>817</td>
<td>AX2</td>
<td>1803.1822 kc, 1876.1897 kc, 1903.1922 kc, 1976.1997 kc</td>
<td>±1 kc</td>
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<td>818</td>
<td>AX2</td>
<td>3500-3997 kc</td>
<td>±5 kc</td>
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<td>819</td>
<td>AX2</td>
<td>7000-7497 kc, 8000-8297 kc</td>
<td>±3 kc</td>
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<td>820</td>
<td>AX2</td>
<td>12.313.61 mc, 14.14.65 mc</td>
<td>±30 kc</td>
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<td>821</td>
<td>AX3</td>
<td>24.24-33 mc, 25-25.5 mc</td>
<td>±3 kc</td>
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**SPOT FREQUENCIES FOR NET OPERATION**

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<td>822</td>
<td>MCP</td>
<td>3.0 mc-10 mc experimental frequencies</td>
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**DIMENSIONS**

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<td>.086&quot;</td>
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<td>MS433</td>
<td>1/2&quot;</td>
<td>1/16&quot;</td>
<td>(6.35)</td>
<td>.032&quot;</td>
<td>OCTAL</td>
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<tr>
<td>813</td>
<td>MCP</td>
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<td>1/16&quot;</td>
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<td>.032&quot;</td>
<td>.086&quot;</td>
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<td>1/16&quot;</td>
<td>(6.35)</td>
<td>.032&quot;</td>
<td>.086&quot;</td>
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<td>CF6</td>
<td>1/2&quot;</td>
<td>1/16&quot;</td>
<td>(6.35)</td>
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<td>1/16&quot;</td>
<td>(6.35)</td>
<td>.032&quot;</td>
<td>.086&quot;</td>
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<td>AX2</td>
<td>1/2&quot;</td>
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BLILEY ELECTRIC CO., UNION STATION BUILDING, ERIE, PA.
ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Karl Brueggerman, W0CDX — SEC: ABE; he is the recent motorboat race at Sweens Lake in Denver. DTY, BON, NLF, 20K, and ENQ handled communications between the boat pits and the official starting stand. They helped keep the race running smoothly. DTY now has an air-conditioned ham shop in which to keep his high-power final from boiling over. LCE has been busy with the tractor this summer with his usual clock for hamming. QTH reports summer conditions very erratic. QYN has a new Viking II and a vertical ground plane. SNH has a new 75-meter antenna in the attic and getting the high-power 'phone rig to work. HDJ also put up a new antenna but is working low power for WB5. WSR-1627WSJ (operator) is monitoring 10 and 20 meters for his old friends. When all others are out, the address seized by JOR. WMJ was able to originate an emergency message to Montana which was delivered and acknowledged in less than 2 hours. The message was sent via the FARM NET, JOR/FB 8 is on 20-meter 'phone and 80, with a Viking II from Denver. AGW and IHO have runs on 220 Me. Traffic: W4RKH Q5C.

SOUTHEASTERN DIVISION

EASTERN FLORIDA — SCM, John W. Hollister, Jr., W4CRZ — A highly successful Dade County Convention was held in Orlando. A hurricane test was held under AVR with MVR, RHD, VGR, TEL, JVL, SHZ, SDL, NJM, TWG, UPJ, UFW, TEL, XIT, WM, WJ, DUR, ZRH, DJH, and DZT. Seven emergency and traffic nets are now going. Send to JO for P2W for a schedule. Several counties still do not have QTHs. Where are you? Yes, SCM thanks you for electing him to another term. FT, Lauderdale: UVEW won the Work Florida Counties Convention. The Outboard Race was won with communications by mobiles PPR, WFN, and VCQ, Pt. B, HRA: RHA (70 years young) uses a Globe Scout and a Scout VFO. LHR ads the home folks to DLAs on the FJQ. On mobiles with a Harvey-Wells and Connect Super Six, new W6JF are A0J and W5WJ. DDTJ adds 'phone to an old and NAQ, FTU. JOR, September Q37 modulator, Q6Q mobile with an Edmak. Lakeland: New OAK-XYL calls are W4JWJ and W4NBG. W4NAQQ, 15 years old, got some publicity with his radio in the UMI, Miami: Saj. activity includes NJQ with a 2-meter linear. A0G with a 501, and TEL with a 10A and SS1, all on 0-9-MHz. Leather 7501 and Signi Slicer, W4MZL and W4UPA are QTH Miami. W4MWA, 11 years old, is the son of EMT. The Johnson Hi-Net 10-20 antenna is becoming popular in Miami. For the record on OAK and YLs. WBY belongs to D0J and SDL belongs to MVR and not in reverse as I reported before. The Red Cross and Dade Club have a B0C-710 on loan from the police. The Red Cross purchased some new gear and IYF and LVL 7 built the shack (WA0ZYV) at the Red Cross Building, Oceola; DTV turned in a new emergency job for Coast Guard plane-landing. Sarasota: 20WY of the Phoenix Ave. Club, a new 20WY, TEL, and 10A. The local and Bill also won his award for "Ten Orlando Stations," "Phone Net traffic: IMT reports 250 for the PFTN and T01 reports 95 for the FPG. Traffic: W4DRD 231, PZT 214, ZR8 88, KJ 80, IMT 76, QBO 58, BAF 50, SWL 40, RWL 38, T20 23, DTV 19, IMT 4, LVL 12, VIE 11, TPM 7, WMZ 7, TVY 4, AXY 2.

WESTERN FLORIDA — SCM, Edward J. Collins, W4WS — SEC: PLE. W4F and W4E have increased power and say that they are going 800 phone on 40 meters. ZFL is keeping 7 Me. hot. W4NGSB is awaiting the new NC-58. MHN is a newcomer, VFP, YQF, and YQH have a new Viking II. UHJ is now having trouble. 7 Me. in the AM, WCGO is going back to Wisconsin. P04 and W4MS made the Delta Convention. VR is trying to improve service for Coast Guard plane landings. Sarasota: 20WY has a new VFO, and 10A reports 95 for the PFTN and T01 reports 95 for the FPG. Traffic: W4DRD 231, PZT 214, ZR8 88, KJ 80, IMT 76, QBO 58, BAF 50, SWL 40, RWL 38, T20 23, DTV 19, IMT 4, LVL 12, VIE 11, TPM 7, WMZ 7, TVY 4, AXY 2.

GEORGIA — SCM, James F. Born, Jr., W4ZD — The Atlanta Radio Club's Hamfest, held in April, was attended by approximately 450 hams. XYLs and Jr. operators. The Viking II transmitter was won by ZRA. The Georgia Creeker Radio Club and Jed 5KX held their second meeting of the year at the Atlanta Hamfest. Attendance was good and plans were made for club and net activities for the coming year. The Georgia Hamfest will be held on the 2nd Saturday of May. The annual Memorial Day Hamfest will be held on the 3rd Saturday of May.

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AMPHENOL twin-lead folded dipole ANTENNA

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1 75-foot length of standard 300 ohm twin-lead for use as feed-in.
1 high strength laminated T-block.
Assembly and installation instructions.

AMATEUR NET
10 meters $5.35 40 meters $7.80
20 meters 6.00 80 meters 11.25

see your AMPHENOL radio parts distributor

Continued on page (4)
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(no stamps, please)

The American Radio Relay League
West Hartford, Connecticut

sent recently passed away. The Cedartown Radio Club's Ham Picnic was a great success with a nice crowd attending, including two old timers, spark-gap lamps, SSB and CW. WJW has a new all-band transmitter. PBW now is in Japan on the air with W2250. FHB has a new 14-Wc beam for DX. The Cedartown Radio Club will operate a portable equipment at the Polk County Fair. The Atlanta Radio Club has obtained a truck for emergency station. The truck is equipped with two all-band transmitters and receivers, emergency generators, a complete field kitchen, water tank, ice box, etc. It is to be used in the Atlanta c.d. and other emergency work in this section and will be on display at the Southeastern Fair. MTS is active on 3955-Mc. phone. HVT is a new 00 and is active on 7- and 14-Mc, c.w. with new finals. One of the highlights of the Atlanta Hamfest was an s.s.b. demonstration by EOA. TRAFFIC: W4UJA 2032. K4AR 1138, WVD 51, OCG 24, FSH 22, MTS 18, HVT 17, IMQ 17.

WEST INDIES--SCM. William Werner, K4IPJ- SEC. KP5QOZ. W9HPW visits NCS KP5OZN in drill night. KP5QOZ reports to the 3925-ke. Net from Mayaguez.

DY is 00 Class II. 0U obtained 2nd-class radiotelegraph license and left for California, where he is W6CTX. KL is on the air with a Globe King TO, raised three-element 15-meter beam to 80-foot tower. DJ put up new 20-meter dipole using 75-thirty kw. twin-lead feeder. Dona Maria Luisa, at Mayaguez, now is WP4WT. KE has a new Viking III. PLZ has a new 195-meter folded dipole. WP4DR now is KP4L and is heard on 75-meter phone. KDZ and K4VHA, KP4S8 endorsement, the highest ever issued. TQ is organizing the Novice Net on 3725 ke. KP4VK is a new Novice license at Antigua on 3725 ke. The first WP4-S license (10 WP4 QSLs) certificate went to KD, RR, and TQ. KY4B has NOS of the new VINET (Virgin Island Net) meeting each Wed. at 7:30 P.M. AST. EC for St. Thomas is KV1SL. BK has folded dipole elements on 20-meter beam. RX has FB Williamson amplifier. 1ST is consolidating his station with 50 kw. at QTH. MV is building 35-foot wood tower for 20-meter beam. A recent check-up during an emergency drill provided the following information on emergency-equipped stations: ES, Ponce, has 375-kw. power plant; CO, Mayaguez, has batteries and 12-volt generator; GP, Anasco, has 5000-watt power plant; KD, Manati, and PL and IK, Ensenada, have emergency power available at sugar central; CP, Guayama, has arrangements with nearby 20 kw. plant to operate 100-B from emergency power at headquarters; DY, Fajardo Heights, has 254-kw. emergency power plant; ID, San Juan, has 500-watt emergency power plant; PR, Carolina, has 154-kw. power plant; KY5BD; ST; Croix, has 152-kw. power plant; KP4AN. KR, Mobile has a new 15-watt rig. VP2S is editor of PRAB's bulletin, Ground Wayne. DJ has mobile heard all the time on 3925 ke. Traffic: KY4B 586, KP4IR 7, DK4 K, DV 2.

SOUTHWESTERN DIVISION

LOS ANGELES -- SCM. Howard C. Bellman, W6VWJ- SEC. QWJ, RH4; BHG, CMN, and GJP. The P.A.A. position still is unfilled. ORES stand at 2.6 MM and CFL. Cbr. Section Net, LSN, run by KL BZQ and AMT. NTN. has a terrible need for outlet. c.w. type, in the Metropolitan Los Angeles Area. Come on, you traffic boys, and listen to 3900 ke. at 2030 PST for a sample of our c.w. net, West Coast style. The Los Angeles Area Radio Club Council had one regular and one special meeting in August and went on record as approving the education of ARRL members in matters concerning League activities. The Rio Hondo Radio Club in Whittier, RRL in Cerritos, and KV6AM in Long Beach, have approved for ARRL affiliation. The Whittier Radio 50 Club held its September meeting in, of all places, a wedding chapel, says LVQ. GYH received his ARS appointment. He has had a perfect report since March 1050 and made HPL 33 times. Gvi reports a nice vacation in North California, and a good time at the Santa Clara ARA "Bar-B-Q." QW announces the appointment of GHJ as EC for San Dimas, and UQL as EC for Temple District. QOP, Los Angeles EC, has bad appointments renewed. QVW has portable rig in Big Sur Gorge of San Joaquin while on vacation. TDW is in golden tobacco. FSE has gone high power. The 2 Meter and Down Club picnic was a huge success. The BEG are expecting. POCO is making code to a Novice neophyte. ONI shows a roster of 45 2-meter net members who meet Thurs., at 1200 on 146.8 Mc. "Correction please and the GEB. "I'm a student of Berkeley Campus, U. of Calif." Bill claims 110 worked and 88 countries QSL. KTV tells of 3 QSLs from CERBA, each legitimate. NAB is a GEB candidate. NTN wants a stab at OBS on 80-meter c.w. KB3, now 2-meter mobile, works San Diego and Downey. ESR's big rig finished with a huge casualty list, including a 4-250A and 500-watt modulation transformer now used as anti-ec meter, and ELLS comes across with another sweep copy of QJM and reports the TCAB is considering lots of 10-meter transmitter hunts. PAB celebrates his birthday on 70-meter machine. HBD, now living in an Elmac, is constructing a ground plane for 10 meters to match. BLY says that the Whittier Radio 50 Club members all signed up for RACES. The club station is W6VX at the City Hall. AMI worked CERBA on 7 bands, including the (Continued on page 109)
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only 3.5-Mc. U. S. A. QSO. PZN uses ground plane on 40 meters for DX. OKD is building a three-element beam. MF is working on new 40-75 antenna. LIV is building a homolite. K1R, Mrs. PJB and the rest of the American Legion held their picnic in Griffith Park. Transmissions: (Aug) W6KXY 2228; MRA 259; LYG 294, 192, NCP 177, H1Z 158, GYH 146, CAK 132, NLM 75, B1G 68, KBEA 32, W6WAP 29, HIF 22, COZ 19, QJP 18, HKD 15, LIV 18, AKJ 9, CBO 7; PZN 4 (July) W6CDU 4, KJQ 4, OX 7.

ARIZONA — SCMA: Albert Steinerdecker, W7LR — Asst. SMCA; Kenneth P. Cole, TQZJ; Dr. John A. Stewart, T77; SEC; OF1, RAL, CFOJ, PZQY, W7FQJ. Perry, Net; Tue, and Thurs. 7 p.m. 3865 ke, Arizona C.W. Net: Nightly 8 p.m., 3515 ke, Novice Net: Tue, and Thurs. 9 p.m., 3704 ke. The month of August saw the reorganization of all the Phoenix clubs into one large club, the Arizona Amateur Radio Club, and will include members from Phoenix and surrounding communities. Officers are: President, IRL; 2nd Vice-pres.; 1RX, 3rd Vice-pres.; RTH (no call), secy.; MWQ, treas. Meetings will be held the 1st and 3rd Thurs. of each month. In addition to the above offices the new club includes KOY, MAE, and O1F. The Arizona C.W. Net will start operation Sept. 1st, with KOY and others in control on 3515 ke. K7FAG is conducting ICW code practice Thurs. at 6:30 p.m. on 20000 kc. at speeds of 5, 8, 10, 12, 15, 20, 24, 28, 32, and 36 WPM. K7PB, UBW, HCB, UBE, UGLN, and U1P. New General Class: TNO, K1HJ got 26-WPM staker, ACD has a new Collins K7GO for the shows of the news. KT20 and 7LA-2, are now QST call. 5DRB-7 is left for French Morocco, and will be on 20 meters. KQJ now is 5BAG in Alamogordo. KE12X, a new 1RX and L1VR have been active. MURS is flying high in the air because of loss of power plant. S1U is back in Phoenix. Traffic: W7KYO 110, 1RX 34, L1VR 14.

SAN DIEGO — SCM: Eugene M. Koenken, Jr., W6PJR — Asst. SCM; Thomas H. Wells, W6BU; Shelley E. Trotter, W6HAM; Richard E. Middelston, W6LNS, SEC: VIV, W6TQ, Asst. SECs: POP, WYA, W6PY, W6J, W6JK, PAM; JPM. JPM is thinking of building a 600-watt rig. Ken, who is chief operator at KAB, and his AXE were blessed with a baby girl. Ben Zawadsky, W6iko, is the new chief operator at IAC. He plans to be on 3515 ke over the weekend. The new chief operator at IAC, JFT, is in with the old gang, the Orange County Club. CHJ had a three-week tour of duty at Angeles Airfield. IAC is on all bands mobile, with 2 meters, and is active in the AUREC, and QSM are checking into the 3515 ke. now. CA Ae-de-TY led the operation for the work. CE8AA, Easter Island. SDM recently visited the Santa Ana group. UFX will be on with a 5000-watt c.w. output this year. ORB is building a rig of two bands. W6S, has been ill but will be back shortly. BGL is on 40-meter phone. L3B checks into San Diego AREG 3265 ke. Net from new QTH, Redondo Beach. The high school gang at IAC will be burning holes in the ether by the time this hits the section news. The boys at IAC will be on 2 meters also. The San Diego clubs collaborated nicely in promoting gear and operators for the San Diego Hobby Show. Thanks again to IOS for the loan of the equipment. KT20 and 75A-2, VIF showed Helix Club Field Day side at the club meeting. UJO is on all bands with self-built Viking II. KQAI, has no rig for the time. Q0D has been in limbo. K3GR, Indianapolis, on 20-meter phone for QSOs to sick dad there. WYA, PKV, and SEG did a splendid job of operating the 16-meter phone, G0DRZ, at the first prize, W6IBY 3014, L1EQ 7, CFT 6. (July) W6IBY 5413, JPM 8.

SANTA BARTABA — Vincent J. Haggerty, W6XJO — Those seeking code practice may copy official bulletins transmitted by DTV, 7715 ke, Sat., and Sun. at 1330 P.M. Speeds of 7 to 100 W.P.M. are used with general USES ultra minutes' duration. KN6BUD is a new ham in Oxnard. OXJ and K6ABS are new OPMs appointees. K6NB1 reports from Santa Maria. YRF reports the E6 Radio Club had a fine turnout at its picnic held at Morro Bay. DLR is the sole reporter from the City of Santa Barbara. Let's hear from more of you. Traffic: K6NB1 49, W6PLZ 21.

WEST GULF DIVISION

NORTHERN TEXAS — Acting SCM: R. E. Byers, Craig, W6QJD — SEC: QLH, PAM: IWQ, RAL, PCN, VIM reports ex-W6OBE is back after 2 years as a WW2 and now is a translator expert, YPS and K6FBB made BPL in August. W6QJSC held an informal meeting with the Kilicycle Club of Fort Worth. MTEN is trying a new roll call method. TLW reports the W6LWA Falls Club is being renewed. ORP appointed QDF is chief operator at K6EFAA on 40 meters for early morning skeds to Texas. His home QTH is Clarendon. TCD writes of a half-meter ham on 10 meters in Fort Worth, M8P and the net are trying to keep 10-meters active. W6PQV and ORP are behind on 10 meters in Fort Worth, and ORP and the net are trying to keep 10 meters active. W6PQV and ORP are behind on 10 meters in Fort Worth and have been active. W6BMU has a new daughter. The Dallas Caravan Club Sheriffs Reserve card is really nice. BPK is a new call in West Texas. W6C is mobile again roaming between Lubbock and Fort Worth. HRA is heard frequently mobile on 75 meters. (Continued on page 108)
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S64N • Std. 6m 4-EL (No T), $16.95. 1 - 12' Boom, 1' Alum. Tubing; 3 - 6' Center Elements, 1/4' Alum. Tubing; 4 - 2' End Inserts, 1/4' Alum. Tubing; 1 - Beam Mount.

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S64N • Deluxe 6m 4-EL (No T), $25.95. 1 - 12' Boom, 1' Alum. Tubing; 3 - 6' Center Elements, 1/4' Alum. Tubing; 4 - 2' End Inserts, 1/4' Alum. Tubing; 1 - Beam Mount.

D64T • Deluxe 6m 4-EL T match, $28.95. 1 - 12' Boom, 1' Alum. Tubing; 3 - 6' Center Elements, 1/4' Alum. Tubing; 4 - 2' End Inserts, 1/4' Alum. Tubing; 1 - Beam Mount.

S102N • Std. 10m 2-EL (No T), $11.95. 1 - 8' Boom, 3/4' Alum. Tubing; 2 - 6' Center Elements, 3/4' Alum. Tubing; 6 - 2' End Inserts, 3/4' Alum. Tubing; 1 - Beam Mount.

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D102N • Deluxe 10m 2-EL (No T), $18.95. 1 - 5' Boom, 1' Alum. Tubing; 2 - 6' Center Elements, 1/4' Alum. Tubing; 4 - 6" End Inserts, 1/4' Alum. Tubing; 1 - Beam Mount.

D102T • Deluxe 10m 2-EL T match, $21.95. 1 - 5' Boom, 1' Alum. Tubing; 2 - 6' Center Elements, 1/4' Alum. Tubing; 4 - 6" End Inserts, 1/4' Alum. Tubing; 1 - Beam Mount.

S152N • Std. 15m 2-EL (No T), $31.95. 1 - 12' Boom, 1" Alum. Tubing; 2 - 12' Center Elements, 1/2" Alum. Tubing; 2 - 8" End Inserts, 1/2" Alum. Tubing; 1 - Beam Mount.

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D152N • Deluxe 15m 2-EL (No T), $39.95. 1 - 10' Boom, 1/2" Alum. Tubing; 2 - 12' Center Elements, 1/2" Alum. Tubing; 2 - 8" End Inserts, 1/2" Alum. Tubing; 1 - Beam Mount.

D152T • Deluxe 15m 2-EL T match, $42.95. 1 - 10' Boom, 1/2" Alum. Tubing; 2 - 12' Center Elements, 1/2" Alum. Tubing; 2 - 8" End Inserts, 1/2" Alum. Tubing; 1 - Beam Mount.

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D202T • Deluxe 20m 2-EL T match, $61.95. 1 - 12' Boom, 1" Alum. Tubing; 2 - 12' Center Elements, 1/2" Alum. Tubing; 2 - 8' End Inserts, 1/2" Alum. Tubing; 1 - Beam Mount.

NEW! VEE-D-X BEAM ROTATOR

Rotates full 365 degree traverse at the flick of your finger. Positive control with no over travel ensures that your beam directly in desired direction is true. Small, lightweight, no maintenance, easy mounting, ganged at top for extra strength. Rugged and powerful, will support 200 lbs. Decorator designed control console provides instant reversible action, ever-dependable compass indication. Price, $29.95.

GOTHAM HOBBY 107 E. 126 Street New York 35, N.Y.
MARS members have been warned to keep active or be dropped. FGN is new RM in NTS. SZQ has converted a relay box to an emergency communications unit for the South Plains Area. Club TVI committees are improving. Be sure to cooperate with your QTH. Glad to hear K4Z and active on 20 meters. KBU is new N8Q for NWTN on 40 meters. K7A and K5L, BPL, VEF and W9M. OHS in Dallas. Traffic: W5TFB 628, K5FBB 608, WMIF 108, K5A 100, TLIW 21, K5AM 10, TTVX 17, JQD 16, YISB 16.

OKLAHOMA — SCM: Joe M. Lambert, WQZ 5, President. Asst. SCM: Ray A. Theurer, 5TFP, SEC: AGM, RM: MOG, PAMS: 811, ROV and ZQW have been voting in Colorado and plans to finish in Arkansas, RST refers to the station's QTH as it is being announced from the truck. BRU is the station's name, and all messages should be sent in as often as possible. EZK is at home but recovering from his illness very slowly. CQQL is back on the air. TKL, VHP, and UQG are in school at A & M, and will report in as often as their studies will let them. GQG is operating a remote control station. The Area Center Radio Club has a new member, and is planning a picnic for Aug. 26th. The Club will sponsor a station tent to be held Nov. 15th. The club is looking for a new member, and will hold a meeting on Oct. 1st. The club is planning a picnic for Aug. 26th.

Grayhill
PUSH BUTTON SWITCHES
for LOW or HIGH AMPERAGE CIRCUITS

For Low Amperage circuits, it's the Series 4000 S.P.S.T. momentary contact switch. Life expectancy, at factory rated, is approximately 800,000 operations. Bushings 1/2-22 N.S.2 thread. Conservatively rated at 1/2 amp; 115 V. AC. non-inductive. Solder type terminals.

No. 4001—Normally open (Red Button)
No. 4002—Normally closed (Black Button)

For higher amperage circuits, it's the Series 2000 S.P.S.T. snap-action switch. A distinct click is heard when actuated. Housing and buton are molded phenolic. Bushings 1/2-32 N.S.2 thread. Rated at 10 amp; 115 AC, non-inductive. Solder type terminals.

No. 2201—Normally open (Red Button)
No. 2202—Normally closed (Black Button)

Write or phone for complete data

513 Hillgrove Avenue
LaGrange, Illinois
Phone: LaGrange 8000

108

CANADIAN DIVISION

MARITIME — SCM: A. M. Crowell, VE1DIQ — SEC: FQ, EC: ER, RM: OM. Activity reports this month... (Continued on page 110)
NC-88
World-Master in coverage...
World Beater in value
The advanced NC-88 circuit uses 8 high-gain miniature tubes plus rectifier, covers 540kc to 40mc with calibrated bandspread for amateur bands. Built-in speaker; two IF stages; 2 audio stages with phone input and tone control; antenna trimmer; separate high-frequency oscillator; sensitivity control; series valve noise limiter; delayed AVC; headphone jack; ... and other features that add valuable performance characteristics to this popular model.
NC-88 complete with tubes $129.95

SW-54
Mighty Midget with a 7-continent "pull"
For the compact ham shack—a truly modern receiver only 11" long, 7" wide, 7" high, yet designed and built to hold a select, sensitive chassis, a good speaker and a front panel as handy and handsome as any. Slip rule general coverage dial with controls, foreign, amateur and ship bands clearly marked. Unique adjustable bandspread. Covers 540kc to 30mc in 4 separate bands. Includes receive-standby switch, AM-CW switch, phone jack.
SW-54 complete with tubes $59.95

HC-60T
Always Has It...In Stock
For immediate delivery
HRO-Sixty
Latest and greatest of the great HRO's!
This famous receiver gives you dual conversion on all frequencies above 7mc plus 12 permeability-tuned circuits in the three 455-ke IF stages. Other new features include current-regulated heaters in the high-frequency oscillator and 6BE6 mixer. Four panel plug-in coils cover 1.7 to 30mc; bands switch automatically when coils are plugged in. Edge-lighted, direct frequency scale shows only the band in use. Negligible drift. Provision for crystal calibrator unit and NFM. High-fidelity push-pull audio with phone Input Jack. Controls: Bandswitch, Oscillator, Tuning, Tone, Antenna trimmer, Dimmer, AVC, Limiter, AF gain, Calibration, CWO, Phasing, Selectivity, On-Off, RF gain, AM-NFM-Phono. Accessory socket for Select-O-Ject.
HRO-60T Table Model, complete with tubes, less speaker $533.50
Includes 4 coils, A, B, C, D, for 1.7 to 30mc.
HRO-605R Rack Model, supplied as above $533.50
HRO-605R Rock Model Speaker $26.00
HRO-605S Table Model Speaker $16.00
NFM-83-30 Broadband FM Adapter $17.95
SOJ-3 Selecto-O-Ject $28.75

NC-183D
12 tuned IF circuits.
1mv sensitivity on 6 meters
Steep-sided skirt selectivity with 3 IF stages. (6 tuned circuits on the 3 high bands; 12 on all other bands) plus a new crystal filter, new bi-metallic, temperature-compensated tuning condenser for drift-free operation and other features make the NC-183D a revelation in all-around performance. Adaptable to NFM. Phone output jack. Covers 1.8-55mc, with bandspread dial on all amateur bands including 6 meters, and bandspread possible on all frequencies within range. Controls: Main tuning, Bandspread tuning, Band switch, RF gain—AC on/off, AF gain, Send/receive, AVC/MYC, tone CWO, CWO pitch, Limiter, Selectivity, Phasing, RF trimmer, Radio/Phono.
NC-183D Table Model, complete with tubes, less speaker $383.50
NC-183DR Rock Model, complete with tubes, less speaker $383.50
Speaker $16.00
NFM-83 Narrow Band FM Adapter $17.95

NC-125
With built-in Select-O-Ject
An up-to-the-minute general coverage receiver incorporating latest engineering improvements and including the Select-O-Ject audio filter. Select-O-Ject can boost any single selected audio frequency 45db or reject any single frequency 45db within a range of 100 cps to 12,000 cps. It practically eliminates annoying heterodynes, whistles and unwanted signals, gives selectivity surpassing that of much higher-priced receivers. Also: Edge-lighted direct-reading scale with amateur, police, foreign and ship bands clearly marked; voltage-regulated, stabilized oscillator; jack for phone or NFM adapter; socket for battery operation and other valuable features.
NC-125 Complete with tubes, less speaker $199.95
NC-125FS — Speaker $16.00
NFM-73 — Narrow Band FM Adapter $18.95

We're generous on trade-ins! What have you got to trade on this fine National equipment? Because of our big outlet in the New York market, we can make you a generous allowance. Send full description.

Write for full details and accessory lists to:
Harvey Radio Co., Inc.
103 W. 43rd St., New York 36, N.Y. • Judson 2-1500

Anywhere in the World Direct from Harvey

NOTE: In view of the rapidly changing market conditions, all prices shown are subject to change without notice and are Net, F. O. B., New York City.
Here's the new SHURE

SLIM-X

All-Purpose Crystal MICROPHONE

MODEL 777
List Price $21.00

MODEL 777's (with switch)
List Price $23.00

(Please includes cord for mounting on stand)

Its Versatility and "Hand-ability" give you an ideal low-cost all-purpose microphone

SLIM X STURDY Smart

LIGHT! The new "777" Slim-X Microphones are rugged little microphones weighing only 6 ounces! They are designed for good-quality voice and music reproduction. Their versatility and "hand-ability" make them ideal for use by lecturers, announcers, instructors, and Hams; for audience participation shows; carnivals; panel and quiz shows; and use with home-recorders. When mounted on either cradle or swivel, the "777" can be removed in a flash (no tools necessary)—simply by lifting it out of the holder. This makes it an ideal "walk-around" hand-held microphone.

TECHNICAL INFORMATION: Smooth frequency response—60 to 10,000 c.p.s.,—special sealed crystal element—long operating life; high impedance; 7/8" single-conductor cable, disconnect type. Dimensions (Microphone only) Length, 11/2"; Diameter 1". Finish: Rich satin chrome overall.

NOTE: Lavalier cord for suspension of microphone around neck is included.

ACCESSORIES FOR "777"

MODEL 538 STAND is a heavy die-cast base. Includes metal screw machine stud for connecting microphone adapter to stand base.

List Price: $3.30

MODEL A25 SWIVEL ADAPTOR feature a long-life, high-quality swivel connector. It is lined with long-life nylon sleeves—for smoothness and scratch-free insertion and removal of microphone.

List Price: $5.50

SHURE BROTHERS, INC.
Manufacturers of Microphones and Acoustic Devices
238 W. Huran St. - Chicago 10, III. - Cable Address: SHUREMICRO

reflect the condition of our bands generally, reports hand hitting a new low for all time. Our Canadian Director, VE5BE, and his XYL recently made a short visit while on a motor tour through VE5-Land. VE5CMA is a new mobile ham in Halifax with the CBC, and VE5RA entertained recently at a very enjoyable party. We understand from the Provincial Radio Officer that some SB equipment is immediately available for the Provincial Control Center and will include a 3900-watt transmitter and ex-RCAF communications receiver of the superb variety. This is a very welcome step forward in the service and plans a vacation trip to W-Land and VE5-Land, TA, AW, OC, and LD have been comparing notes on their equipment and QSL reception which has been of high quality of late. Traffic: VE5AAW 275, FO 106, ZM 41, OC 10.

ONTARIO — SCM, G. Eric Frueholz, VE5AH — SEC: K1. I regret to report that NOG, the out-of-town co-worker, has had a bad break. A hope you come along rapidly, OM. DNE emerged from a damp basement and took to the fresh air. He says he was surprised that there was so much railroad work. We welcome DFM, who sends in his first report of activities since 1947. Many will recall him under the call QG when he was SCM of this section in 1936, a club he helped very ably. Congratulations to Mr. and Mrs. ESF on their recent marriage. BUR has added more wire to the antenna. VE5JRP, ex-5BDM, vacationing on Lake Huron with his family, is working 3.5-Mc, mobile and looking for contacts on 420-Mc. AJP, formerly of New Jewksec, now is located in Paris, Ontario. AJP recently overheard on the local monitor, all antenna baysовых, VE5QF mobile by this way to section and visited VR. Traffic: VE5AT 240, BUR 199, NG 111, IA 90, EAM 99, VE5BZ 12, VE5F 19, FO 105.

QUEBEC — SCM, Gordon A. Lynn, VE5GL — The annual meeting and picnic of the Radio Amateurs of Quebec was held again this year at 10th Anniversary Camp and again was an informal get-together and ragchew on the previous evening in Quebec City. At Camp the nettles were registered, together with families and friends. Results of the election of the officers of the Province as follows: ALHR pres.; FS, vice-pres.; ZL, secy.; general. KG, treasurer; KB, advisor. With donations from various sections of the Province, it was announced that 265 VE5s had obtained their call-letter license plates for this year. VE5 has renewed its appointment and would like to see more of the VE5 LCs on the air on LO-NITE. DR reports into OSN daily at 7 P.M. and has been finding conditions very trying, but he has a happy ADU, aged 15 years, old, a 40-watt ham in Three Rivers, BK is confined to mobile, the main rig still needing completion of the control circuit. AW, VE5MO, in mobile from the Village of Face Mountain, Plattsmouth, QC, is operating from the Laurentian Mountains. CA reports skids with the North Country washed out, the old gang having departed; and conditions so poor that Phyl has not been able to arrange skids with the new crews. BQH anticipates operating from the St. Lawrence area, at 7 P.M. AE1G and AE1T are invited to call in on this net with traffic. Traffic: VE5BO 275, VE5G 21, CA 18, UC 25.

ALBERTA — SCM, Sydney T. Jones, VE5MJ — HM has taken off on an extended trip to Eastern Canada. We understand SG is taking up permanent residence in VE5-Land and extend to him our sincerest good wishes. We are all very thankful for a good job as treasurer of the NARC. A most successful hamfest was held in Edmonton on Sept. 5th and 6th. The attendance was good and included the VE5s, VE5Es, and our old friends, W7DSS and his XYL from Great Falls, Montana, WASD, and VE5F from the PNW. A hamfest has been held at the farm of Lord and Lady Rodney, V56EY, Fort Saskatchewan, VE5F and VE5G have definite plans for 144-Mhz. operation. The gang with VE5F and VE5G are making recovery from their injuries, VE5RZF was a visitor to Edmonton. LQ topped the local gang in the May Frequency Measuring Test, closely followed by HM, DX, BB, and MJ. Traffic: VE5HM 104, WC 32, OD 22, MJ 4.

BRITISH COLUMBIA — SCM, Peter McIntyre, VE5CT — The mobile and hidden transmitters had been well organized, affairs, with each club taking charge of them in turn for each summer month. The Turf Club had a mobile station up to Dallas B.C., and the Island gang converged on AKN at Jordan River. AH1, ex-SDK, now is operating in Vancouver. New mobiles heard around Vancouver on 77 meters, A7, AGP, and AGB, had a visit with W6B6Y, mobile VE57, and W6AQ Nylon while they were in town. Summer holidays somehow depleted the roll on the AH1 BOS, but there still are approximately 40 regular checks. UT and family have been moved to Dallas Island, near Pt. Rupert. OF has been appointed EF for District No. 4. SB, newly-appointed District Officer, and OHS and OPS, chief barker of one cruiser he is trying to keep aloolt on the lake to K. Koloski. Anyone wishing to form a c.w. net, contact the HM, CRL, at 3rd Airdrie Road, New Westminster. Also anyone is welcome to check in on 37 kc., between 1800 and 1900 hours Mon. through Sat. I would still like to hear from the outside club owners and virtual amateurs in any activity in their district. I'm no mind reader and the crystal ball works, but we don't know what's going on outside Vancouver. The two activity reports

(Continued on page 112)
NEWARK'S
Page of Values!

VARIABLE CAPACITOR BUY!

Ideal for VFO 63 Mmf
High quality variable capacitor originally designed for use in the master oscillator section of the famous BC-375. Extremely rugged construction and fan tail tracking adjustment make this unit ideal for VFO use. 3000 volt flashover. Solid, plate fastened and side by side. 4 point, screw set suspension. Micro-metric adjustment. Wt., 2 lbs. 54G683. Special Price... 1.35

AEROVOX CAPACITORS
At a Fraction of Their Original Cost! Highest quality round can oil-filled capacitors. Porcelain insulators. Av. ship. Wt., 1 lb.

<table>
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<th>No.</th>
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<th>VDC</th>
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NEWARK CAPACITOR SPECIALS!

.01 Mfd. 8000 VDC Test. Rect. oil-filled. Single porcelain insulator. 1 lb. 54G685. 10 for 7.50. Each... .98c


5 Mfd. 1000 VDC. Type BAR. Oil filled. Solid, terminals. Size, 3 3/4"x3 3/4"x 3/4". Wt., 1 lb. 54G400. 10 for 7.50. Each... 98c

.2 Mfd. 5000 VDC. Sprague oil-filled unit. Ceramic terminals, 10/32" Stud. Size, 3 3/8"x3 3/4"x 3/4". Wt., 2 lbs. 54G585. 10 for 10.00. Each... 1.29

.1 Mfd. 3000 VDC. Round can capacitor. Upright mounting. 2 3/4"x15/16" dia. Wt., 1 lb. 54G608. 10 for 1.25. Each... 20c

.1 Mfd. 5000 VDC. General Electric Pyranol-filled filter capacitor. Large ceramic terminals. With mfg. clamps. Size, 3 3/4"x3 3/4"x 3/4". Wt., 3 lbs. 54G004. Special Price... 4.95

WAR SURPLUS TUBE SPECIALS

3C24/24G ................................. 495c 805 ........................................ 4.50

100TH .................................. 11.95

SPECIAL PARTS VALUES!

35 ohm, 50-watt Pot. Ohmite Type 1/2" wire-wound pot. Heavy ceramic form. 1/2" shaft for 3/4" mfg. hole. 1 lb. 54G687. 10 for 5.50. Each... 69c

Feed-thru Insulator. Double cone high clax ceramic insulator. 1/2" diameter. Mounts with 1/8" above chassis. Complete with 10/32" threaded rod, washers, and nuts. Wt., 1/2 lb. 54G58. Special Price... 10 for 1.00

Low-loss Stellite Socket. For 829B/ 3529 or 832 tube. Center has large cooling hole. Less shield Base. Mfd. by Johnson, 1/4" mfg. centers. Wt., 1/2 lb. 54G588. 10 for 5.00. Each... 56c

Mallory Type No. 1-2 Noise Filter. For filtering generator hash. Will handle either 6 or 12 VDC at 50 amp. Formerly used on 12 volt railway systems. Easily mounted on car generator. Wt., 1/2 lb. 54G502. 10 for 5.00. Each... 69c

SAVE ON TRANSFORMERS!

Thordarson T-45166 Output Transformer. Single 6L6 to 2-4-8-500 ohms voice coil. Case size 2 1/2"x2 1/4"x3" high. Shpg. wt., 5 lbs. 54G501. 10 for 12.00. Each... 1.50

Driver Transformer. P.P. 2A3's to grounded cathodes. Case size 3 1/2"x2 1/4"x3" high. Shpg. wt., 5 lbs. 54G111. 10 for 15.00. Each... 1.95

NEW SHIPMENT! STANDARD BRAND CAPACITORS


Stock Capacity Net

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<th>No.</th>
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</tr>
<tr>
<td>54G10</td>
<td>1 mid. 6000 volts</td>
<td>8.95</td>
</tr>
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Send today for NEWARK’S NEW CATALOG NO. 56

Complete Lines of Radio, Television, Amateur, and Industrial Electronics Equipment.
I received from DH and QC were left at home while I typed this at work, so they are not included in this report.

MONTANA — Leonard F. Cuff, VF-14, X0 is building new broad-band, all-band exciter and should be heard by the time you read this. KO still manages to work DX in spite of ill health. CV has been spending the summer working in W8-YLand, K8YD, Geoffrey, of Melbourne, Australia, arrived in Winnipeg Sept. 4th and is thinking of making his home here. We all extend a warm welcome to you, Geoffrey, and hope that you will find your new home and its people to your liking. CJG has taken up residence in Winnipeg again after an absence of about 15 years. Welcome back home, Yie, EC-2X and TX, who now reside in the warmer climate of W8-Land, are looking for contacts on 20 meters with the VE2 gang. At last reports they expected to be operating VE2-RX, W6, SH, and YV made the trip to the Dauphin Hamfest and report a good time was had by all. Once again SB walked off with one of the prizes. We also hear that a number of you attended dances at Killarney, Manitoba, and Lake Bronson, Minn., U. S. A. No traffic counts were received by your SCM this month. If you do not send in your traffic count and news items to your SCM he cannot put them in this column.

SASKATCHEWAN — SCM, Harold R. Horr, VESHR. — Sorry there was no report last month, follows, but I received only one station report and it takes a lot more than that to make the column. Now that we are into the fall and winter season, let's hear from you. PG reports that the WARC held its 4th Annual Field Day at Trossachs with a record attendance to make the event the most successful yet. PQ now is mobile, PD and AS are doing fine on mobile. MV took the big step. We all wish you and Shirley the best. 70O, D, and that XYL, and don't forget HR on his trip East. W2TONR and his XYL, K2ACN, visited DK and HR on their way to K7-Land, W8MKN and his XYL visited Sault Ste. Marie, complete with mobile and canoe. LU has a 75A-3 and is all set for winter activities. 5TE now is FT5E, CC now is located at Kellogg. GR has been transferred to Ottawa with the D.O.T. Traffic (Aug.) VES6E 12, PJ 10, FG 4, HR 4, (July) VESPJ 4.

November 1928

. . . September hurricane emergency work by n4AAN at St. Thomas, Virgin Islands, and AAF (AAF operating) at Palm Beach is commended in this month's editorial.

. . . Associate Technical Editor Ross A. Hull furnishes constructional data on 4-tube, 3-tube and 2-tube "High-Frequency Receivers for the Coming Year."

. . . The subject of "Frequency Stability by Mass-orientation Oscillators" is treated in considerable detail by Technical Editor Harold P. Westman.


. . . The six-stage circuit used by Howard Allan Bahn at Massachusetts Institute of Technology is featured in "A 28-Megacycle Crystal-Controlled Transmitter."

. . . A "100-Meter Low-Power Transmitter" described by George B. Hart, S8K, can be built of receiving-type parts at an approximate cost of ten dollars.

. . . In "Experimenting with By-Pass Condensers," John F. Rider discusses the proper choice and use of condensers to be used as c.f. by-passes in audio circuits.


. . . A new variable condenser announced available by Radio Engineering Laboratories has its shaft rotated in a pool of mercury to eliminate noise.

. . . "Now We're in the Air!" by Wallace S. Williams, W6CIF, sums up the work of Los Angeles area amateurs who comprised the Southern National Air Races communications.

. . . Clair Foster, W8CMV-W2QW, writes on activities of the mysterious "s6RX" worked by a good many DX'ers earlier in the year.
"PICON"

There's a short but potent sentence in the Communications Act of 1934, as amended, which reads:

The Federal [Communications] Commission, if public interest, convenience or necessity will be served thereby, subject to the limitations of this Act, shall grant to any applicant therefor a station license provided for by this Act.

Thus the fate of an application for a new broadcast station, for example, may depend entirely upon the applicant's ability to demonstrate that his proposed station will operate in the "public interest, convenience or necessity." The phrase is so often used in Washington that it is sometimes shortened to "picon."

There is no space on the application form for an amateur station license, you may have noticed, requiring your proof of "picon."

Why not? For a very good reason:

Because amateur radio as an institution, through your American Radio Relay League, has established itself as a service operating in the public interest, convenience and necessity. Proof of your individual right to a station license is furnished for you by ARRL speaking for the amateur service.

Are you doing your part to support organized amateur radio activities by membership in the League?

QST and ARRL Membership
$4 in U.S.A., $4.25 in Canada • $5 elsewhere

HERE IS AN EFFECTIVE HIGH PASS FILTER TO SUPPRESS TELEVISION INTERFERENCE!

The Regency Model HP-45 High Pass Filter is a constant "K" type filter with a cut-off frequency of approximately 45 mc. in a 300 ohm balanced line. Attenuation at 29 mc. is approximately 20db. At frequencies of 14mc. and below, the attenuation is 40db, or more. Signals above 55mc. are passed through the filter without loss. Simple to install--full instructions included with each unit.

REGENCY Division of I.D.E.A., Inc., Indianapolis 26, Ind.

AMATEUR NET, ONLY 99c
TO MAKE A GOOD RIG BETTER

USE CANNON PLUGS

ABC, NBC, CBS and all radio and TV stations have used Cannon Plugs almost exclusively since they started...You can have the same high quality and dependability that spell satisfaction...in rig building and operation.

XL SERIES. With thumb pressure LATCHLOCK—no accidental disconnect. Mike and audio connector; 3 or 4 contacts; seventeen complete assemblies. Standard on top quality mikes. Available through most radio jobbers.

P SERIES. The old faithful—radio men swear by it, not at it. Thumb pressure LATCHLOCK, positive connection. Up to 8 contacts; steel plug shell. Ninety-nine complete assemblies for audio circuits and power.

UA SERIES. The RTMA specified standard, weatherproof; gold plated contacts, spring insert removal. Thumb pressure LATCHLOCK.

K SERIES. For power supplies, audio circuits and combined circuits. A great variety of shells and inserts.

In building a compact rig, look into the new "D" sub-miniatures 15, 25, 37, and 50-52 contact arrangements. They're really small. Likewise the "U" series—1-12 contacts. New XL Bulletin ready; also ask for RJUC-6 with prices and list of our franchised distributors.

CANNON ELECTRIC

CANNON ELECTRIC CO., LOS ANGELES 31, CALIFORNIA

50- and 144-Mc. Mobile

(Continued from page 20)

crystal must be within one of these ranges: 8.333 to 9.0 Mc.; 12.5 to 13.5 Mc.; 25.0 to 27.0 Mc.

Tuning of the exciter portion of the transmitter is perfectly straightforward and, at 50 Mc., requires only that C5 and C12 be resonated at 25.0 and 50 Mc. respectively. A voltage and current chart shows the approximate operating conditions for the 5763s and, if this section of the rig checks out, it is time to test the final.

Before moving on to the amplifier, turn the supply off and connect a jumper between Pins 3 and 5 of J2. Check to make certain that the bulb is connected to J1 and that S1 is set at the 50-Mc. position. Now, apply power and resonate C17 as indicated by a dip in plate current. The proper setting for C17 will be well toward minimum capacitance, provided that the tuner is similar to the original one. Next, set C16 at approximately full capacitance and reread the plate tuning control. The voltage-and-current chart lists amplifier data that apply to operation with the dummy load in use. If interested in checking bias voltages, make the measurements with a vacuum-tube voltmeter, or with a general-purpose test instrument connected in series with an r.f.-choke inductance of at least 1 mh.

The set-up for testing at 144 Mc. is similar to that used at the lower frequency. Work with just the two exciter stages at first and employ a crystal in any one of the following ranges: 8.0 to 8.222 Mc.; 12.0 to 13.333 Mc.; 24.0 to 24.999 Mc. If a 12-Mc. crystal is selected, the oscillator may be tuned to either 24 or 36 Mc. In either case, the multiplier must be tuned to 72 Mc. by means of C12. The oscillator is always tuned to 24 Mc., when crystals within the 8- and 21-Mc. ranges are used.

Amplifier operation at 144 Mc. is also tabulated in the voltage-current chart. Naturally, S1 must be snapped to the 144-Mc. position. The amplifier plate current will show only a slight dip when the tuner is resonated, because of the doubler-type operation and the fact that plate-circuit losses are somewhat high until the stage has been properly loaded. Resonance of the tuner and the series-tuned output circuit will occur with both C17 and C18 adjusted well toward minimum capacitance.

The series-tuned output circuit for the transmitter is intended for use with low-impedance antenna systems and, as a result, it is recommended that quarter-wave whips be used in the actual mobile installation. One system would involve the use of a 2-section 50-Mc. whip that can be reduced to a length suitable for 144-Mc. operation by removing the top section.

Any of the 10-watt modulators that have been described in the Handbook and in QST may be used with the transmitter providing power input to the amplifier is kept below a 20-watt level. More audio will be required if the 21526 is to be operated with a plate voltage in excess of 300 volts.

114
Squirrel Cage BLOWER and MOTOR
Brand new, surplus blower with motor, manufactured by Redmond. Ideal for cooling large transmitting tubes and interior of rack cabinets. Extremely quiet operation. Capacity 100 cubic ft. per minute. Rugged, dependable motor is completely enclosed and operates on 115 volts, 60 cycles AC. Speed: 1600 RPM. 18 watts. Blower with Motor $7.95

DISCOIL
The newest idea in mobile center loading coils, just out of the great state of Texas! Pancake wound high Q coil, 7/8" dia., provides capacity loading. Easy to tune, and to top for 40, 20, and 15, as well as 75. Rugged poly construction. Takes standard 9/16" SAE top and bottom whips. DISCOIL $11.95

SHERRICK
Snap-in loading coil mount for quick band QSY with high efficiency. (See page 111, Oct. QST.) Mount, with coil for 75, 40 or 20. Complete with coil for 75, 40, 20 (and 10) $15.00 $22.50

Famous VIKING II
Fully shielded, filtered and TVI suppressed, 180 watts CW input, 135 watts phone. Covers all bands from 10 to 160 meters. New 616 final gives high efficiency at low cost. With tubes, cabinet, detailed assembly, wiring and operating instructions, less crystals, key and mike. Complete Kit $279.50 Laboratory Wired & Tested $324.50

JOHNSON VFO KIT
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JOHNSON "Match Box" Antenna Coupling System
Matches practically any line and can be used with any transmitter up to 250 watts. Loads antennas from 25 to 3000 ohms. Instant band-switching - 80, 40, 20, 15, 11 and 10 meters. Impedance 52 ohms. Self-contained antenna changer relay. Shielded cabinet. $49.95

JOHNSON SWR BRIDGE
Permits adjustment of "Match Box" for minimum SWR and maximum harmonic rejection. Impedance 52 ohms — can easily be changed to 72 ohms. With coax connectors and color coded meter jacks. $9.75

JOHNSON Bi-Net Resonator
Change bands while in motion! Fully automatic, dual 10 and 20 meter band antenna resonator permits use of single whip for transmission and reception. Needs no switches or relays. $10.95

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then adjusted for maximum grid current to the 1625. It should be possible to obtain as much as 4 ma. of grid current, although the amplifier will operate satisfactorily with less. As a final adjustment of the driver stages, C6 and C8 should be stagger-tuned to give most uniform output over the band. Coupling between the oscillators and the 12SA7 should be the minimum that will produce the necessary grid current to the final amplifier. The output circuit is resonated by C16, of course.

If you have a g.d.o., short the output coax connector and resonate L9 and L7, by adjusting L7, to the TV channel where TVI is most noticeable. If you do not have a g.d.o., you can adjust L7 while watching the interference pattern on the TV set.

Running about 18 watts input to the final amplifier, very excellent reports have been received from the East Coast, down to Argentina. Plate-screen modulation is used on 'phone and, since both oscillators run continuously, there is no chirp on c.w. With a 600-volt supply, the input was increased to 60 watts.

Novice Rig

(Continued from page 30)

your wiring; it’s likely you’ve made a mistake in the hook-up. Look also for unintentional grounds — spots where bare spots of wire are touching the chassis. Sometimes a blob of solder will hang from a terminal and touch the chassis.

Antenna

The type of output circuit used in the rig will load with almost any length of wire. However, it will load with a 30-foot length of wire on both 80 and 40 meters a great deal easier than with some lengths. As stated earlier, the writer tested the rig at his home and the antenna used in that case was a 30-foot length of No. 14 wire. One end was connected to the output terminal and the other end was suspended on an insulator at the far end of the house. If the antenna is to be strong outside, be sure it doesn’t touch any metal or other objects, and is insulated at its far end.

Output Indicator

The rig can be tuned up by the meter, but sometimes a beginner may become confused trying to interpret the readings he gets. There is a simpler gimmick to use to show that the antenna is taking power. All you need are two pieces of wire, about two feet long, and a 2-volt 0.06-ampere flashlight bulb, either No. 48 or 49. The bulb is connected between the two pieces of wire, one lead to the tip of the bulb base and the other lead to the shell of the base. We now have a four-foot length of wire with the bulb in the center. One end of this wire is connected to the output
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HARMONIC TVI VIRTUALLY ELIMINATED

MULTIPHASE EXCITER MODEL 10A (upper left). Approx-
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or without carrier, double sideband AM, FM, break-in CW,
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ALL BUILT-IN to this truly versatile exciter. Built-in power
supply also furnishes blocking lida for linear amplifier and
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coil sets for $3.95 per band.

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MODEL A RECEIVER ADAPTER (upper right). Improves
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ception of SSB, AM, FM and CW. Cuts interference and
heterodynes in half. Eliminated distortion caused by selective
fading. Works into any receiver having 450-500 kc IF.
Built-in power supply. Use a Model A Slicer—notes the
"holes" in even our most crowded bands and bears signals you
have never heard before. Wired and tested $74.50. Complete
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terminal, or clipped to the antenna at the output
terminal, while the other end is clipped on the
antenna, three or four feet up. When the rig is
turned on and the condensers are tuned, a point
will be reached in the tuning where the bulb will
glow, or light up. Tune the condensers for maxi-
imum brilliance in the bulb; this indicates maxi-
mum power going into the antenna.

Operating

All you need to do now is start calling other
stations or CQ. Don't be discouraged if you don't
get an answer on the first call or two. Keep at it,
and suddenly you'll find that you are in business.

If you should receive reports of your signal
having a click, the installation of C4 should clean
up this condition. To the highly-critical ear, the
signal without the use of C4 might show clicks,
but the writer didn't have this trouble, so C4 was
left out.

We didn't talk about 40-meter tune-up pro-
cedure, but it is the same as for 80 with the
exception of using the correct crystal, and short-
out the section of L1. Remember to listen on
your receiver when tuning up the rig on 40 or 80.
If you're tuning up on 30, the signal should be
definitely louder on 40 than on 80 meters, and
vice versa for 80-meter tune-up.

TVI shouldn't be a problem. The rig described
here was thoroughly tested and showed no trace
of interference.

One thing more — daytime contacts on 80 or
40 will always be over much shorter distances
than those made at night. Likewise, daytime con-
tacts will be less bothered by interference from
other stations. The little rig may not be the
highest-powered job in the world, but it will prove
itself by producing plenty of contacts: some
amateurs have worked all continents with as
much power.

Color Television

(Continued from page 34)

wheels. Carrying knockdown antennas and masts,
it permitted our setting up in any spot that
seemed best suited for the purpose, and required
no accommodations other than room for its four
wheels and the antennas. In buying the car, too,
we had in mind that it would be mighty handy
for carrying the TVI demonstration equipment
described last month.3

Although the reduction of radiation had not
been a consideration in the design of these experi-
mental receivers, the level was unexpectedly high
and the frequency distribution so wide that two
of the participating organizations, RCA and
Hazelton, undertook to see what could be done
to reduce it in their receivers. Arrangements were
made to conduct subsequent tests under identical
conditions, after the receivers were modified. At
these tests it was found that even though the
measures taken in both receivers were not elabo-
rate, there was a marked reduction in radiation.

(Continued on page 180)

3 "ARRL TVI Demonstration Completes Its First Tour,"
QST, October, 1953.
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WORLD TIME CLOCK

AUTOMATIC, ELECTRIC 24-HOUR CLOCK WITH HUGE 10" DIAL, SWEEP SECOND

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It is appropriate to note here that since the sidebands extend several hundred kc. on either side of the subcarrier it is again impracticable to clean up the situation by moving the subcarrier frequency, within the possible limits of such a shift. This puts it squarely up to the receiver manufacturer to reduce the radiation to an acceptable level. The following quotation from the report of one of the organizations on this point also is appropriate: “Fortunately, the interference is easily reduced by adhering to good design practices in the application of circuit layout, shields, and filters in the various circuits. The cost of applying these remedies is minor and does not seriously affect the final cost of the color receiver.”

**Monochrome Receivers**

Tests similar to those above also were conducted with monochrome receivers receiving a color signal. The presence of color sidebands in the video circuits of such receivers, although not utilized, opens possibilities of interference that did not exist with a pure black-and-white signal. Representative receivers in current production were used in these tests.

It is gratifying to be able to report that under no circumstances did the operation of the 80-meter transmitter cause any visible interference attributable to the presence of the color signal. This aspect need not worry us, therefore.

Radiation from the receiver is another matter. The color sidebands do get radiated, although with considerably less intensity than in the case of a color receiver. However, since there is no local oscillator at 3.58 Mc. in the receiver there is no modulation of its harmonics by the sidebands; hence the only harmonic radiation is by direct generation of harmonics from the sidebands. This fortunately, is negligible, so only the 80-meter band is affected by the radiation. Again, this is a problem for the receiver manufacturer.

**In Summary**

In fact, the whole question is one of receiver design. This has been obvious right from the beginning. The League’s purpose in raising the question with NTSC was to make the industry aware of the interference possibilities so that, if the opportunity existed to change the subcarrier frequency and such a change would help relieve the design problems, it could be done before the standards were made final by FCC adoption. The work of the Amateur-Color TV Interference Committee not only showed that the visualized possibilities of interference did exist, but further showed that moving the subcarrier frequency did not constitute a satisfactory answer. So it is in the laps of the receiver manufacturers, and there is reason to believe that it will not be ignored in future production.

Along these lines, the committee’s final report to NTSC, which is included in NTSC’s proceedings and will eventually become part of the FCC proceedings (Continued on page 122)
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record in the proceedings leading to the adoption of color standards, makes the following recommendations (the Appendix A referred to includes the reports of the organizations that modified their receivers as described above):

"a. Because the real solution to the bilateral amateur-color TV interference problem lies in suitable receiver design, the Committee considers it essential that the industry do the following:

1. Design each receiver to minimize radiation at the color subcarrier frequency and its sidebands and harmonics thereof.

2. Minimize its susceptibility to strong fields created by nearby amateur transmitters.

b. The Committee recommends industry action to establish suitable standards, including measurement techniques, for minimizing such radiation and interference susceptibility.

c. Pending the completion of industry action each receiver design should incorporate measures for accomplishing (a). These may be similar in nature to those described in Appendix A."

Thanks to Vernon Chambers, W1JEQ, who did most of the construction work, the gear was ready to roll by the end of March. The preliminary tests at Princeton came off as scheduled, and showed that our early fears were not groundless. What we learned at Princeton was invaluable in determining the procedures to be used in the scheduled field tests, and also in indicating the desirability of some extensions and modifications of our transmitting and receiving equipment to speed up collecting the necessary data.

It should be emphasized at this point that NTSC itself was faced with many of the same difficulties. The paucity of transmitting facilities, the very small number of receivers scattered around the laboratories of the country and the necessity for bringing them all to one spot at one time for formal trials, all conspired to make the time available for testing of any kind extremely limited. Schedules, consequently, were very tight. Nevertheless, the time we needed was found for us. The committee is especially grateful to Mr. Knox McIlwain, chairman of the NTSC Panel on Field Testing, for his excellent cooperation and sympathetic interest in its problems, and to Dr. T. T. Goldsmith of Dumont for supplying a color signal on both UHF and on WABD at times when other commitments made it impossible to get such a signal from WNBT, the station used in the official field testing.

The committee participated in the NTSC field test held at Bayside, L. I., May 6th. Eight of the major manufacturers and laboratories had receivers there — nearly all the sets in existence, as a matter of fact. All of them were pretty highly experimental — in most cases, the principal attention had been concentrated just on making the receivers work, to the exclusion of other

(Continued on page 124)
For the Ham in the Family
slippers, etc. Make this Christmas the happiest ever for the Old Man. Get him that longed for piece of ham gear. Sound him out. Uncle Dave will help you in making your selection.

**Collins 32V-3 Transmitter**

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- **Hallcrafters SX24 Receiver**

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- **RME 70 Preselector in Cabinet**

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considerations. If anything, most of them would be expected to be considerably worse with respect to stray pick-up and radiation than actual production models. It was a relief to find, therefore, that in no case did the operation of the transmitter cause color break-up. Such interference as did appear was a relatively mild bar pattern; its intensity varied from receiver to receiver, as was to be expected from the differences in construction. This was with a weak TV signal and the transmitting antenna 25 feet from the TV receiving antenna, with an input of 500 watts: practically all the interference disappeared with greater separation between the antennas.

It was established that the interference was most noticeable when the transmitting frequency was on or close to each color sideband frequency, without much variation in intensity throughout the 80-meter band, but practically disappeared when the transmitter was adjusted to a frequency in between the sideband frequencies. Considering the conditions under which the tests were run, this phase of the color TVI question should not give amateurs too much trouble, provided the receiver-building industry, now forewarned, takes a few simple steps to prevent undue pick-up on the color circuits.

The fact that interference effects do not tend to be confined to transmitting frequencies near 3.58 Mc. but are more or less equal at all the sideband frequencies precludes the possibility of any significant improvement by changing the color subcarrier frequency, at least within practicable limits.

Receiver Radiation

Excluding transmitter harmonics and receiver front-end overloading, which do not represent new elements in color as compared with monochrome, it seems probable that a color receiver is more likely to interfere with a near-by amateur than that an amateur operating in the 80-meter band will interfere with color reception. On every receiver checked, the radiation level at the 3.58-Mc. oscillator frequency and the associated side frequencies was much greater than from deflection-circuit harmonics, the present source of ITV. Since the color side frequencies are positioned midway between the sweep-frequency harmonics, a receiver that is really "hot" in both respects can do a job that would make some of those jammers that infest the h.f. broadcast bands green with envy.

This radiation is not confined to the vicinity of the 80-meter band. The color demodulator or detector operates at a rather high level, and generates harmonics of 3.58 Mc., each of which is modulated by the same sidebands that are associated with the fundamental frequency. Thus there is a group of radiated birdies centered around 7.16 Mc., another around 14.32 Mc., and so on. All the receivers tested actually put out stronger "hash" on the 7-Mc. band than on 3.5 Mc., and some had radiation of fairly high intensity even in the 10-meter band.
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125
Coaxial Antenna

(Continued from page 41)

then soldered to the washer of the whip section of the antenna.

The sleeve section is now slipped over the mast and screwed to the sleeve cap. At this point it is a good idea to paint the sleeve, the sleeve cap and the mast. Do not paint the sleeve cap insulator or lower sleeve spacer.

The antenna, now assembled, is ready for installation. The bottom end of the mast section is placed in a hole drilled about four feet into the ground with a post-hole digger. This depth is adequate to support the antenna and also permits the mast to serve as a clothes post. Bricks and rocks are piled in the bottom of the hole and a bag of ready-mix cement mixed up and poured into the bottom of the hole. The balance of the hole is then filled with dirt. The antenna is self-supporting and no guy wires are necessary.

The coaxial cable lead-in may be laid along the ground but the installation will be made more complete by burying the cable in the ground from the antenna to the shack. The trench may be dug with a trowel or lawn edger and need not be more than a few inches deep—enough to put the cable just under the sod of the lawn.

Results with this antenna have been excellent at W9YVZ. When the band is open, east and west coasts and some DX is worked with good results and reports. When the band is "dead" and only locals are coming through, contacts up to 100 miles with reports of S8 to S9 are made. This was not possible with the horizontal antenna previously used at this location. Mobile stations are easier to contact and the range of operation with mobiles has been extended. The power run by W9YVZ is only 18 watts.

There have been many arguments about vertical vs. horizontal antennas on ten meters. Here is a vertical coaxial antenna which, at least for the writer, has proved itself superior to horizontal dipoles and yet is simple and inexpensive to construct.

World Above 50 Mc.

(Continued from page 66)

Herb feels that he has learned quite a bit from the construction and operation of this job. It raises the possibility that well-designed long-Yagi arrays could produce higher gains than most of us now attain, without going to excessively large dimensions. An honest 20-db. gain might be possible with perhaps not more than 4 long Yagis, and for the fellow who likes to build 'em big, the possibilities are endless. Who's next?

This one is for the "horsetraders." GW2ADZ wants a couple of 6AJ6s or 6AN4s for his 430-Mc. work, but he can't send over the money for them. Anybody interested in a swap for a subscription to any of the British magazines? Bill, you may recall, recently lost the 420-Mc. record to W1RFU and W4TL, but he's doing some line work. He has worked DL3FM crossband, for what would have been another record, and has had two-way contacts with P4AML 335 miles, in addition to his 382-mile ex-record with ON4UV.
NEW JOHNSON VIKING II

The Johnson Viking II transmitter kit incorporates all the desirable features of its predecessor plus those required for effective TVI suppression. 100 watts output on phone and 130 watts on CW on all bands 10 thru 10 meters. New final amplifier uses parallel 6140 tubes. All parts supplied, including copper plated steel cabinet, chassis, wiring harness, all hardware and tubes. Complete construction test and operation manual also supplied.

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<tr>
<th>Model</th>
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</thead>
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<tr>
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NATIONAL

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<td>HAMMERLAND</td>
<td>264.00</td>
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MC-55 Net ........................................... $69.50
MC-53, for 2, 6 and 10-11 Meters .................. 56.60
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BOSTON, MASS. 110 Federal St.
Sweepstakes
(Continued from page 47)
listing and awards.
6) Awards: Certificates will be awarded to the highest c.w. scorer and to the highest 'phone scorer in each ARRL section. A c.w. certificate will also be awarded to the highest scoring Novice or Technician in each section where at least three such licensees submit c.w. logs; similarly, a 'phone certificate will be earned by a Novice or Technician in each section where a total of three such licensees submit 'phone logs. Only single-operator stations are eligible for certificate awards. Multiple-operator scores will receive separate QST listing in the final results.
A gavel will be awarded to the highest club entry. The aggregate scores of 'phone and c.w. reported by club secretaries and confirmed by the receipt at ARRL of contest logs constitute a club entry. Segregate club entries into 'phone and c.w. totals. Both single- and multiple-operator scores may be counted for club entries. Only the scores of bona fide club members, in a local club territory, may be included in club entries.
The highest single-operator c.w. score and the highest single-operator 'phone score in any club entry will be rewarded with a "club" certificate where at least three single-operator 'phone and/or three single-operator c.w. scores are submitted.
7) Disqualification: Failure to comply with the contest rules or FCC regulations or the necessity for avoiding interference with channels handling amateur emergency communication shall constitute grounds for disqualification. In all cases of question, the decisions of the ARRL Contest Committee are final.

"I Have Observed..."
(Continued from page 48)
these contestants almost invariably write to ask, "Why wasn't I listed with a score of 5 million?" The answer usually concerns one or more of the following points. These are offered by the ARRL contest checker as a means of avoiding disappointment with your next final score:
1) ARRL will furnish, upon request, forms for all its operating activities. The use of these forms, or copies of them, will serve to prevent two of the more disappointing and embarrassing mistakes: the chance that your log may be misplaced, or the chance that you will be entered in the wrong contest. A log on a 5 × 7-inch index card, for example, is often crowded, hard to read, and may not even specify the contest activity to which it refers! Such small papers are easily misplaced among large numbers of contest entries.
2) Use official ARRL lists for counting sections and countries. For example, Newfoundland and Labrador are not separate from Canada nor is Delaware separate from Maryland when counting countries and sections respectively. A complete list of ARRL sections appears on Page 6 of every issue of QST. An official ARRL Countries List is published every year in January QST; or a copy will be mailed to you on request. In most contests, results are grouped by sections and competition is considered to be on a section level. Therefore, when entering such a contest state plainly on your log in what section you live. If you are not sure, send us your operating address and we will be pleased to tell you in what ARRL section you may compete.
3) In several operating activities, you cannot
(Continued on page 180)
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IMMEDIATE DELIVERY
Single Sideband Exciter SS-75

Check these specifications and you'll see why the SS-75 is now the one piece of equipment that places all the advantages of single sideband at your finger tips:

★ Built-in stable VFO, with voltage regulation.
★ Carrier injection to receiver antenna terminals...tune in SSSC signals the same as AM, no other gadgets necessary.
★ Illuminated VFO tuning dial provides 31 inches of bandspread 3800–4000 KC in 4 bands, with 5 to 1 gear reduction.
★ Built-in voice control and receiver disabling circuit. Also provides for break-in CW operation.
★ Specially designed crystal filter network for maximum stability and reliability.
★ Carrier injection to transmitter available for working single sideband WITH CARRIER, for tune-up adjustments, or CW.
★ 10 watts output, with additional 807 socket for up to 100 watt operation with external power supply.

★ Handsome grey crackle cabinet, chrome trimmed, 20" x 12" x 12". Complete with 12 tubes, including one 807, operating manual...............................$245.00
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40, 20 meter coils, $1.75 each

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62 Berkeley Street
Valley Stream, N. Y.

Happenings of the Month
(Continued from page 48)

Mr. William P. Massing, Acting Secy.
Federal Communications Commission
Washington 25, D. C.

Dear Sir:

Although in general u.h.f. television has been relatively free from many of the interference problems which plague the v.h.f. service, there is one new aspect which is already causing some difficulty and, as additional stations come on the u.h.f. band, has serious potentials of interference not only from the amateur service but from many other communications services as well.

The difficulty, which may have already come to the attention of the Commission in field investigations, is peculiar to v.h.f. sets which are “converted” for u.h.f. reception by the insertion of tuning strips. As is well known, the customary procedure is a dual conversion system. For each u.h.f. channel, an oscillator frequency is selected which permits use of the fundamental for the second mixing process, and use of a harmonic for the conversion at the receiver input.

Let us give a single example of a tuning strip to receive Channel 14 on a v.h.f. set having a 21.25 Mc. i.f. The local oscillator is approximately 165.67 Mc., with its second harmonic employed to beat with the incoming Channel 14.
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</tr>
<tr>
<td>No. 1110A INCREMENTAL INDUCTANCE BRIDGE</td>
<td>HIGH FIDELITY</td>
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<tr>
<td>No. 1020B MEGOHMETER</td>
<td>MILITARY PULSE</td>
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<td>No. 1010A COMPARISON BRIDGE</td>
<td>TOROIDAL INDUCTORS</td>
</tr>
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<td>No. 1050 VACUUM TUBE VOLTMETER</td>
<td>PRECISION FILTERS</td>
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<td>No. 1040 VACUUM TUBE VOLTMETER</td>
<td>SUB MINIATURE — HERMETICALLY SEALED</td>
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signal for the first conversion process. We then see that:

- Sound channel, TV Channel 14: 247.75 Mc.
- Second harmonic, 165.67 Mc. oscillator: 351.33 Mc.
- First intermediate frequency: 144.42 Mc.
- Fundamental, local oscillator: 166.67 Mc.
- Second intermediate frequency: 21.25 Mc.

This of course works into the proper spot in the present i.f. system of the receiver.

It is to be noted that in this case the first intermediate frequency falls within the exclusively-amateur band 144-148 Mc. Particularly because this frequency within the receiver is an immediate part of the front end, signals from amateur 144 Mc. stations may, through fault of the operator, ride in and disrupt the picture thoroughly. In fact, this situation has arisen in several localities already.

It is obvious that nothing can be done at the amateur transmitter to alleviate this interference, and such difficulty as is experienced is due solely to spurious response in the "converted" receiver.

It might be assumed that the phenomenon occurs only with a few isolated u.h.f. channels. That is not the case. The use of a common origin for the oscillation signal for both mixing functions necessarily restricts the choice of first intermediate frequency. Further, the existence of v.h.f. receivers with two possible (second) intermediate frequencies—21.25 and 41.25 Mc.—doubles the combinations which work out to produce a first intermediate frequency within the amateur 144-Mc. band. Listed below are the u.h.f. channels that can be susceptible to this type of interference from amateur 144-Mc. operation, based on an i.f. channel width of 6 megacycles:

$1.85-Mc. sound i.f.$

<table>
<thead>
<tr>
<th>Channel 14 to 18</th>
<th>Channels 20 to 25</th>
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<tr>
<td>41 to 48</td>
<td>51 to 88</td>
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<tr>
<td>69 to 77</td>
<td>82 &amp; 83</td>
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This is more than half the total of u.h.f. TV channels.

It is of importance to the general problem, if not immediately to us, to consider the fact that in the cases of the other u.h.f. channels not listed above, the first intermediate frequency falls within bands on one side or the other of the amateur 144-Mc. band, which of course are similarly occupied by communications services and not by broadcasting services. In other words, no matter what the i.f. channel, the potentiality of interference from services other than broadcast has been created by the conversion system outlined above, in view of the deficiencies in front-end selectivity to be expected.

We note that in this strip conversion system the first intermediate frequency is determined uniquely by the normal intermediate frequency of the v.h.f. receiver and the order of oscillator harmonic used in the conversion process. We assume that the industry has taken what, in the designer of a broadcast receiver, would be a natural step—to choose oscillator harmonics that would avoid having the first i.f. fall in a band allotted to broadcasting services, in this case v.h.f. television and F.M. The probability, then, is that the first i.f. range is confined to the band 108-174 Mc., all of which is assigned to other services.

If those in industry choose to avoid mutual difficulties within the family of broadcast services, we consider it only a calculated risk on their part that the overall interference situation will be less than otherwise. However, the risk is indeed theirs. The amateur service, for one, does not propose to go through another difficult period, again not of its own making, carrying the burden of public misunderstanding and abuse which arises solely because of the inadequacy of television receiving apparatus. We therefore seek the continued cooperation of the Commission, and especially of your field organization, in making it perfectly plain both to the public and to industry where the fault lies in cases of interference arising from the causes we have outlined.

Sincerely yours,

A. L. HUDSON
General Manager
NOW OFF THE PRESS

The 31st edition of the Radio Amateur’s LICENSE MANUAL is complete, up to date, and revised to include the latest information on amateur licensing. Contains all the dope on frequency privileges for the various classes of amateur licensee. NEW SECTIONS have been added covering the U.S.-Canada Reciprocal Operating Agreement and code-practice schedules. And of course, it has the new exam schedule for the fourth quarter of 1953.

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HAMS

By Charlie B. Cooper

Way back years ago
When God created the world we know,
He planted something in the air
A something no one knew was there,
Until in Nature's wilderness
Man found and harnessed wireless.

Yes, Nature is a wilderness
Filled with wonders none can guess.
Of unearthed treasures in its store,
Buried in air or earthen core,
Lying concealed so none can find,
Till God prepares the human mind.

Some folks think that scientists
Discovered all knowledge that now exists
Of wireless, radio, and kindred arts.
But myriad Hams, with home-made parts,
Developed and proved, and cut and tried,
In ways that cannot be denied.

And that's what wireless Hams are for;
To cut and try and to explore
The hidden paths to Nature's store —
Cutting, trying, searching, ever
Theories old, or theories new,
Ever building — never through.

Hams may be doctors or engineers,
Lawyers or merchants, yet pioneers,
Working in so-called Wireless shack
With breadboard sets, or costly racks,
With no glory given — no flags raised,
And seldom are they ever praised.

Through fifty years in Wireless,
The ones I've found most tireless
Are Hams who cut and try, and yet
The only pay they ever get
Is lure, and pride in what they do
To bring more knowledge into view.

And as with microphone or key
Their signals fly o'er land and sea,
They thrill to mastery of power
That lets them fly from tower to tower,
Exploring this, or that, country
With voice and personality.

Hams have something worth a lot —
An inner something that can't be bought.
It's memory of effort and work well done.
Of much accomplishment, along with fun.
And things that matter — things that last —
Are happy milestones of the past.

So let us thank the Lord that we
Have been a part, and lived to see
Wireless - Radio - TV — grow
Until it spans the world, and so
Let's shape its use to God's great plan
Of "Peace on earth, good will to man."

[This is written to W2FX and to happy memories of the 22 years in which I have had to listen to the thousand-and-one transmitters and aerials he has built (verbally). — C.B.C.]
Two for two

Two excellent units for the ultimate in two meter mobile performance, the "222" transmitter, the "226" receiver. Both are small in size, both top performers. Built like good mobile equipment has to be built... sturdy, rugged... capable of withstanding vibration... highest quality, conservatively rated components... nothing marginal in either parts or circuitry. "222", "226", equipment with dependability as the design keynote.

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"222"—2 METER TRANSMITTER

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"226" RECEIVER: Freq. range 143-149 mc, 2-RF, (6AK5's) 1-I.F. with 6 tuned circuits. Shunt-type noise limiter. Antenna trimmer. 7 tubes plus 682 voltage regulator for HF oscillator. Tunable.

"222" TRANSMITTER: Freq. range 144-148 mc. Power output 5 to 7 watts into 50 ohms. X11 controlled. 6X8 osc-mult, 5Y3 multi, 2E26 PA, 2A5Q3's plate mod.

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Hints and Kinks
(Continued from page 53)

CLAMP-TUBE SCREEN-GRID KEYER CIRCUIT

An arrangement used for both the protection and the keying of an ARC-5 final amplifier is shown in Fig. 6. Most of the parts used were taken from surplus equipment, explaining the selection of a Type 12A6 tube for the circuit. The circuit is unlike other keyers in that it provides the amplifier screen grids with a negative potential during key-up periods. Naturally, this condition results in maximum amplifier cut-off, which in turn improves the possibilities of obtaining satisfactory amplifier keying.

In Fig. 6, the bias for the amplifier (either fixed or grid-leak) is fed to the 12A6 through resistors \( R_5 \) and \( R_3 \) and to the amplifier screens through \( R_1 \). A fixed positive voltage is fed to the 12A6 grid through \( R_4 \) and \( R_5 \) and the key is connected between the junction of these two resistors and ground. \( R_8 \) is the normal amplifier screen-dropping resistor and \( C_1 \) permits adjustment of the keying characteristics. The regulator tube is connected in series with the amplifier screen lead.

For Selectivity Never Before Achieved In a Communications Receiver

Dr. Qwak

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137
Most of the circuit constants are not too critical. However, $R_3$ should be about as shown. If the resistance is too large, it will cause backwave when the final is keyed. If the value is too low, it will cause the bias to change with keying. The value suggested for $R_3$ is suitable for use with a 150-volt supply and the resistance should be increased if more than 150 volts is employed. The circuit does not perform satisfactorily with the ARC-5 final when the positive bias voltage is less than 150 volts. $C_1$, as recommended, may be a little large for another type of amplifier, but 0.05 µfd. is, at least, a good value to start with.

— Jim Tonne, W5SUC

ANOTHER METHOD OF POSTING QSL CARDS

What to do with the QSL cards is always a problem but it seems that the most popular method of storage is still to post them on the wall. The method shown in Fig. 7 does not leave marks on the wall nor does it damage the QSL card in any way.

Fig. 7 — Here is how WN6TKA prepares a QSL card for on-the-wall posting. Strips A and B are placed on the card with the adhesive side out and strips C through F are mounted with the adhesive against the card.

For each card to be posted, cut six pieces of cellophane tape or, better still, the “wet-or-dry” type of masking tape, of the ½-inch-wide variety. Cut two of the strips just slightly less than the width of the card, and the other four strips about an inch in length. Place the longer strips across the width of the card (one at each end of the card) adhesive surface up, and place the shorter strips face down, one at each end of each longer strip of tape. This will firmly hold the tape to the card, adhesive side out.

Then simply place the card wherever you want it on the wall and presto — there it sticks, firmly and neatly, for as long as you want it there. It will adhere to just about every wall surface encountered, too, from wallpaper to rough stucco or plaster.

Cellophane tape, masking tape or adhesive tape will all work equally well. The masking tape, however, is the more economical and many other uses for it can be found around the shack. Electrical tapes of any kind should be avoided for this purpose, as the black adhesive usually comes off on the wall.

— Richard F. Van Wickle, WN6TKA
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