AN INSTANT HIT!

RME MC-55
MOBILE CONVERTER

FOR 10-11, 15, 20, 40 & 80 METERS

FOR 6 AND 12 VOLT OPERATION

In bringing out the new MC-55, RME anticipated the needs of the amateur by providing for both 6 and 12 volt operation, the latter voltage becoming increasingly popular on new car models. In addition, you're all set for fone operation on 15 and 40 meters since the MC-55 covers all ham bands, 10 thru 80 meters! As a pioneer in the construction and design of converters, RME has built into its new models rock-like stability, so that they can "take it" in the hard-riding old jalopy or the smooth new Cad. Many of the features found in the VHF-152A and the HF10-20 are incorporated in the new mobile converters.

SMOOTH FREQUENCY CONTROL

Knob driven 25 to 1 worm gear provides smooth frequency control that stays put. Experienced operators welcome this feature since it enables careful, accurate tuning while the car is in motion. Other brand new features found only in the MC models, make these small, compact converters outstanding performers. Compare the design and workmanship, then decide!

Write for Illustrated Specification Sheet.

Address

RADIO MFG. ENGINEERS • Peoria 6, Illinois

MC-53

Also ask to see the new MC-53, the only converter for 2, 6 and 10-11 Meter Operation.

HIGH GAIN — Adds average gain of 25 db to any receiver.

BUILT-IN NOISE CLIPPER — Highly efficient automatic noise limiter all ready to connect into your car radio. Handy In-Out Switch.

STAND-BY SWITCH for muting converter while transmitting.

LOW POWER REQUIREMENTS — All miniature low-drain tubes. Requires only 18 ma at 150-180 volts.

TUBE LINE-UP — 6BJ6 rf amp, 12AT7 osc and det, 6BJ6 if amp, 6AL5 noise limiter.

LARGE DIAL — Large, attractive edge-lighted dial calibrated for 26.4-30 mc, 21-21.5 mc, 14-14.3 mc, 7-7.3 mc and 3.5-4 mc.

MOUNTING BRACKET SUPPLIED.

ATTRACTIVE CABINET, complete with tubes, connecting cables and instruction sheet.

AMATEUR NET $69.50

RME DIVISION OF Electro-Voice
NOW have a more compact rig—a cleaner tube installation!

USE G-E 6CL6 POWER-PENTODE MINIATURES!

POPULAR, versatile type 6AG7 takes a back seat to G.E.’s 6CL6—a new miniature equivalent that will do what the larger tube will do, while occupying but a fraction of the space!

You can add this “plus”: the new miniature’s 9-pin construction provides two base pins each for control and screen grids. This feature increases flexibility when connecting up the tube. The 6CL6 is useful in so many different ways, you are assured of a clean installation no matter how you may apply the tubes or revamp your circuitry later.

In a low-power rig, two 6CL6’s will handle your r-f unassisted, one as oscillator, the other as amplifier-output tube. For medium power, two 6CL6’s will feed the signal into your “big bottle”, with the first again serving as oscillator. The second splits the functions of buffer and frequency amplifier, or does either job alone.

Ask your G-E tube distributor to show you the 6CL6! Do your pocketbook a favor by taking advantage of the tube’s moderate price! Tube Department, General Electric Co., Schenectady 5, N. Y.

6CL6
9-Pin Miniature

- Filament Voltage: 6.3 v
- Filament Current: .65 amp
- Plate Voltage: 300 v
- Plate Current: 30 ma
- Screen Voltage: 300 v
- Screen Current: 7 ma

ELECTRONIC TUBES OF ALL TYPES FOR THE RADIO AMATEUR

GENERAL ELECTRIC
SINGLE-SIDEBAND reception requires high stability. The 75A-3 is stable as a rock—because it's controlled by a rock. Quartz crystals, a different one for each band, control the high-frequency oscillator. The low frequency injection voltage is supplied by the famous Collins permeability-tuned oscillator—also noted for its stability.

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And, with the 75A-3, you don't have to nurse single-sideband signals in with the b.f.o. control. Just set the b.f.o. knob for high-sideband or low-sideband operation and tune in those single-sideband signals with the main tuning dial.

We have prepared a descriptive booklet on the 75A-3. It includes information on single-sideband reception and the new Collins mechanical filter. Write for your copy today; or better yet, see your nearest Collins distributor for a demonstration.

75A-3 receiver with 3 kc mechanical filter.
Net domestic price .......................$530.00
10" matching speaker and cabinet assembly.
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It's value like this—and more of it dollar-for-dollar in every price class—that has made Hallicrafters equipment the unchallenged first choice of the world's most critical expert, the American amateur operator for 19 years.

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Section Communications Managers of the ARRL Radios, are invited to report station activities on the first of each month for the preceding month to the SCM or, secr. of the ARRL, 225 Main St., Newington, Conn. Radio Club reports are also desired by SCMs for inclusion in QST. All ARRL Field Organization appointments are now available to League members. These include ORS, OGS, OPS, OQ and OBS. Also, where vacancies exist SCMs desire applications for SEC, EC and LAM. Additional information concerning positions is available from the ARRL. In the United States and Canada are invited to join the Amateur Radio Emergency Corps (see for Form 7).

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* Officials appointed to act temporarily in the absence of a regular official.*
THE AMERICAN RADIO RELAY LEAGUE, INC.

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.

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Dakota Division
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229 S. Mabel Ave., Sioux Falls, S. D.
Vice-Director:

Delta Division
JAMES W. WATKINS, ........................ W4FLS
220 N. Howell Ave., Chattanooga, Tenn.
Vice-Director: GEORGE D. ALEXANDER, W8BMM
Plano, Texas.

Great Lakes Division
JOHN E. BRAHAN, ................ W8SEE
417 Ford Road, Detroit 33, Mich.
Vice-Director: HAROLD E. STRICKLER, W8SWZ
217 W. 5th St., Marysville, Ohio

Hudson Division
GEORGE V. COOKE, JR., ................ W2DBU
88-31 219 St., Bellerose, 36, N. Y.
Vice-Director: THOMAS J. ERMANS, JR., W2NKG
1092 Anna St., Elizabeth, N. J.

Midwest Division
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308 S. Vasaar, Wichita, Kansas
Vice-Director: JAMES N. KEMIM, W8MYG
1404 S. Tenth, Salina, Kansas

New England Division
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Vice-Director: FRANK L. BAKER, Jr., W1ALP
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Northwestern Division
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Vice-Director: KURT W. WOHLNERT, W7WBG
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Pacific Division
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Vice-Director: RICHARD F. O'BRIEN, W6ATO
243 Colin Ave., San Francisco 12, Calif.

Roanoke Division
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426 Maple Lane, Danville, Va.
Vice-Director: M. B. SAMMONS, W4BDW
133 Broughton St., S. E., Greenville, S. C.

Rocky Mountain Division
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740 Lafayette St., Denver, Colo.
Vice-Director:

Southeastern Division
LAMAR HILL, ........................ W4BOL
110 Myrtia Drive, Upland, Ga.
Vice-Director: ERNEST W. BARR, W4GQR
911 Rosemary Ave., SW, Atlanta, Ga.

Southwestern Division
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1452 Cherokee Ave., Los Angeles 16, Calif.
Vice-Director: WALTER J. JOOST, W5ERK
1315 N. Overholts Drive, Inglewood, Calif.

West Gulf Division
A. DAVID MIDDLETON, ................ W5CA
2-9 Bay Road, Tijeras, N. M.
Vice-Director: CARL C. DRUMMELL, W5KHC
6824 N. 58th St., Oklahoma City 12, Okla.
"It Seems to Us..."

THE WOUFF HONG

In an institution as old as amateur radio, traditions and symbols of the art appear and become a part of it. Our traditions are many, among them our long record of self-policing, our dedication to public service in emergencies, our amazing versatility in experimentation, our instant response to the call of our country in time of war. But of the symbols, only one — aside from the ARRL diamond — has become a part and parcel of the framework of amateur radio, the symbol of its finest traditions, its long and glorious history.

That symbol is the Wouff Hong.

Every ham should know its origin. It seems to us that it is time to retell the story of this famous and beloved part of the very fabric of amateur radio.

It started back in 1917, in the very earliest days of ARRL and QST, when an anonymous amateur, writing under the title "The Old Man," created a wonderful series of humorous stories in the magazine. In a pithy, irascible style he assailed all that struck him as criticizable about ham radio operation of the period in his famous "Rotten Radio" series, beloved to this day by all who read them. He pitilessly exposed the poor operating practices of the day, yet did it in a way which drew chuckles even from those recognizing themselves as the special targets of his ire.

In one of those stories, "Rotten QRM," he launched forth with examples of some of the poor sending cluttering up the band in a particular QSO to which he was listening. The gibberish included the words "wouff hong" which, apparently, was being used by someone on somebody else.

It turned out to be one of those priceless pieces of spontaneous word invention. Instantly, it caught on with the gang. Although T.O.M. himself admitted at the time he didn't know exactly what a wouff hong was, it quickly became something with which both to attack bad operating practices and to discipline their perpetrators. Within three months, the editor of QST found it necessary to write an editorial on the growing demand from the gang for wouff hongs. How rapidly this situation might have developed had not World War I intervened is a matter of speculation. But the tradition had been established, the Wouff Hong created in the minds of thousands of amateurs as some mythical instrument of torture to be used in enforcing good operating practices in amateur radio.

When QST resumed after the war, one of its first contributors was T.O.M. In an early 1919 issue he contributed an article on "Rotten Starting" to work off steam on the slowness with which our government was getting around to let us operate again. At the conclusion of this article appeared the following: "In the meantime... I am sending you a specimen of a real live wouff hong which came to light out here when we started to get our junk out of cold storage. Keep it in the Editorial sanctum where you can lay hands on it quickly in an emergency. We will be allowed to transmit soon and then you will need it."

The object was duly received at HQ. The Editor, fully mindful of the historic significance of the occasion, took the instrument to one of the first Board meetings in New York, May 3, 1919, subsequently duly reporting in QST that "each face noticeably blanch[ied] when the awful Wouff Hong was... laid on the table." By an action still a part of the League's official records, that Board voted that the Wouff Hong be framed and hung in the office of the Secretary of the League. There it remains to this day.

We know the significance of the Wouff Hong. We don't know the significance of its weird shape. Not even the beloved T.O.M. (revealed, after his death, as none other than...
our first president, Hiram Percy Maxim) ever explained that. Nor was the precise manner of its use ever prescribed, although it perhaps may be guessed with a little imagination. But as the years passed, it continued to grow in the affections of amateurs the country over; old-timer and youngster alike. It became the inspiration of the Royal Order of the Wouff Hong, the amateur secret society of ARRL conventions. Today, it is thoroughly entrenched in the lore of amateur radio as its most sacred symbol.

See it when you next visit ARRL Hq.

W7BG, noting the Farad, Calif., Stray in March QST, points out that CQ (spelled Sekiu) is really a town in northwest Washington state. There are no hams in Sekiu to his knowledge. He thinks this may account for the fact that so many CQs go unanswered these days.

W3KDR sees little logic in manufacturing neutralizing tools from plastic drink stirring rods (p. 67, February QST). He's always seen the thing the other way around.

For the student of the technical in amateur radio's history, W1DF points out that an early form of grid-dip meter shows up in the May, 1923, "Antenna Issue" of QST.

W3NRG advises that inexpensive steering-column flashlight holders, available at mail order and automobile parts stores, make excellent mountings for small mobile converters, control boxes and the like.

OREGON STATE CONVENTION

Salem, Oregon, May 23rd-24th

The Oregon Amateur Radio Association will sponsor an ARRL Oregon State Convention on May 23rd-24th to be held at the Marion Hotel in Salem. Included in the program of entertainment for visiting amateurs are lectures by eminent authorities, contests, equipment displays and an opportunity for "swap and shop." ARRL President Dosland and Northwestern Division Director Roberts are scheduled to give talks on the 24th. Prominent civic leaders and representatives of the field of radio and electronics to be present include John Reinartz of Eimac and Ray Morrow of the Morrow Radio Manufacturing Co.

Registration fees are as follows: General and Advanced Class amateurs, $7.00; Novice Class, $5.00; non-licensed persons, $3.00. Pre-registrations close May 10th. Further information may be obtained from William F. Sanders, 1230 Fairview Ave., Salem, Oregon.

HAMFEST CALENDAR

CALIFORNIA — Saturday, May 2nd, at the Fresno Memorial Auditorium — the 11th Annual Hamfest of the Fresno Amateur Radio Club. A dinner and an evening of interesting activities have been planned. Pre-registration tickets, at $4.50 each, may be obtained from Grant Storey, 908 W. Pico, Fresno.

MISSOURI — Sunday, May 31st, at the Greve Coeur Farmers Club, 2 miles west of highway 66 on Olive Street Rd. in St. Louis County — the Greater St. Louis Hamfest will be held. There will be a barbecue and lunch with the usual refreshments and many unusual and exciting activities such as dancing, music, games, etc. Children will also be able to run and amateur participation contests. Admission $1.00 for adults. Children accompanied by parents will be admitted free. For further information contact Dr. H. A. Itecht, WZ2KZ, 7649 Delmar Blvd., St. Louis.

GEORGIA — Sunday, May 31st, at Lithia Springs — The Big Kennebouchee Hamfest for 1963, sponsored by the Kennebouchee Amateur Radio Club of Marietta. The program includes a barbecue, transmitter hunt, swimming and entertainment for the XYL and children. Tickets sell for $2.75 for adults, $1.50 for children under 12. Advance registration not required but tickets may be obtained from R. B. Pledger, W4UPG, 208 McCard Street, Marietta.

CALIFORNIA — Sunday, May 17th, at Paradise Camp near Santa Barbara — the Santa Barbara Amateur Radio Club will hold the Annual Tri-County Hamfest. Interesting talks, auctions and transmitter hunts will be featured. The central location of the hamfest site will make it easily accessible to amateurs from many surrounding towns. Further information will be supplied by Ray Ruby, W6KZ.

ILLINOIS — Sunday, June 7th, at Camp Ki-Shaau-Wau, near Utica — the Annual Hamfest of the Starved Rock Radio Club. There will be games, contests and entertainment for all. Special programs have been planned to interest boys and the fair sex. Free coffee and doughnuts will be served at 10 A.M. Follow hamfest signs south from junction of Illinois routes 173 and 71 near Starved Rock State Park or east on black-top road from route 51 at Tonica. Registration is $1.00 prior to May 25, $1.50 at the Hamfest. For additional data, write to W9MKS in Utica.

PENNSYLVANIA — Saturday, June 6th, at the club grounds on the old Pittsburgh Road — the Fourth Annual Gabfest of the Uniontown Amateur Radio Club, formerly the Fort Necessity Amateur Radio Association. An interesting program, including movies, auctions and refreshments, has been arranged. For more information, write to the club at P. O. Box 849, Uniontown.

ALABAMA — Sunday, May 31st, at Millers Park, Mobile — the Amateur Radio Club of Mobile will sponsor its Annual Hamfest. Gillis Cook, club president, will supply further information.

KANSAS — Sunday, May 24th, at the Osage City Fair Grounds, Osage City — the Annual Ham Picnic of the Nessho Valley Amateur Radio Club. Better known as Christy's picnic, this affair in the past has drawn hams from several states. A rig will be operating on 75 meters to guide the mobles. Registration is 50 cents. Bring your own food and tableware. Coffee, doughnuts and soda pop will be furnished.

KANSAS — Sunday, May 3rd, at the American Legion Hall in Satanta — the Fourth Annual Hamfest of the Hi-Plains Amateur Radio Club. Festivities will begin at 9 A.M. and will feature a covered-dish lunch at 1 P.M., followed by an all-day program of fun. Entrance fees from the XYEs has been planned. There will be rigs on all bands from 160 thru 10. Admission is $1.00 for adults, 25 cents for junior ops.

COMING A.R.R.L. CONVENTIONS

May 23rd-24th — Oregon State, Salem, Ore.

June 20th-21st — Rocky Mountain Division, Estes Park, Colo.

July 10th-12th — National Convention, Houston, Texas
An Eight-Band Mobile Transmitter

15-Watt 'Phone-C.W. Rig for 160 Through 6

BY C. VERNON CHAMBERS, WJEQ

OUR COVER

- If you have been left out in the cold whenever conditions or interest shifted the gang to a band which the existing rig won't handle, then you should be about ready for the type of transmitter shown on our cover and described here.
- It's a bandswitiching-multicircuit-tuner job that can hop from band to band in a matter of seconds.

The transmitter described is a compact audio-r.f. assembly that delivers approximately 10 watts output. It includes crystal and meter switching and has provision for external VFO input. The first two stages and the output coupler employ bandswitching and the amplifier uses a multicircuit tuner in the plate circuit. No coil changing is necessary in the amplifier circuit to cover 3.5 to 30 Mc., inclusive, and only a single coil need be changed for operation on 1.8 or 50 Mc. The transmitter keys well for c.w. work and is plate modulated during 'phone operation. Relays for starting and antenna changeover are built into the unit and the push-to-talk circuit employed permits microphone-button control of an externally located power-supply relay. The plate power requirements are 200 ma. at 300 volts and can be met most economically by a vibrator-type supply. The battery drain is approximately 15 amperes when the transmitter is operated at full input. The physical layout of the unit permits either under-the-dash or trunk mounting.

The Circuits

The circuit diagram of the transmitter, Fig. 1, shows that Type 5763 tubes are used in the three r.f. stages. In the oscillator section, $S_1$ permits selection of any one of five crystals or of an external VFO that may be connected to $J_1$. $S_2$ grounds the cathode of the tube through a bypass condenser when VFO operation is employed. Parallel feed is used in the plate circuit of the oscillator and $S_3$, is the bandswitch for the plate coils. These coils, $L_1$ through $L_6$, have inductance values which allow 1.8-3.5, 6-7, 8-25 Mc. crystals to be used in the oscillator. The cathode of the oscillator is returned to the common keying jack, $J_9$, along with the cathodes of the intermediate and amplifier tubes so that the entire r.f. section may be keyed.

Bandswitching of the intermediate amplifier is accomplished by means of switch $S_{12}$ and inductors $L_6$ through $L_{10}$. $L_{11}$ is one end of an inductive neutralizing link used to stabilize the transmitter in the 14-28-Mc. range. Instability at other frequencies was cured by making the intermediate stage slightly degenerative, with the latter accomplished by using a cathode bias resistor, $R_9$, without the customary by-pass condenser. The intermediate circuit may be worked straight through or as a frequency multiplier, and its output can be adjusted to any value within reasonable limits by the excitation control, $R_6$.

Parallel feed and a homemade multicircuit tuner make up the plate end of the r.f. amplifier. The tuner is resonated by means of $C_{19}$ and employs plug-in coils. $L_{15}$ coils for 1.8 and 3.5-7 Mc. plug into Prongs 2 and 3 of the 4-prong socket and the forms for these two coils carry the output links, $L_{16}$. Prongs 1 and 4 of the 4-prong


May 1953
Fig. 1 — Circuit diagram of the mobile transmitter.
Panel view of the mobile transmitter. The meter switch is located to the right of the milliammeter. The excitation control and switches S1 and S2 are in line, from top to bottom, below the meter. Controls for the amplifier, interstage between the panel and lower the bandswitch, S3. The knob at the lower right-hand corner is for the output-capacitor tuning of the plug-in coils are mounted on the right-hand edge of the chassis and the amplifier is located to their rear. L33 is supported by a tie-point strip to the right of the socket for L13-L14, and the 75-ohm Twin-Lead runs back to L13 of the intermediate stage.

socket are connected to the link tuning condenser, C20, and the output switch, S30, respectively. A 3-prong socket is used for the 14- through 50-Mc. section of the tuner. Coils for 14 through 23 Mc. (L13) plug into Prongs 1 and 5 of the socket and have a jumper connected between Pins 4 and 5 of the form, thus tying this half of the circuit back to the parallel-tuned portion, C14. C13. The 50-Mc. coil does not include a jumper and, as a result, the plate tank at this frequency is simply a series-tuned affair with L13 connected in series with one half of C18. L14 for both of the higher frequency ranges is mounted so as to connect between Prongs 2 and 3 of the socket and, in turn, to C30 and S30. The neutralizing winding, L13, is a one-turn loop that encircles the 3-prong coil as shown in the panel view of the transmitter. This loop is connected to L13 of the intermediate stage by a short length of 75-ohm Twin-Lead. The loop is large enough to permit inserting and removing the plug-in coil with ease.

Switch S30 has three of the fixed contacts connected to L13 and three contacts tied to L14. The rotor arm of the switch connects to the antenna jack, J5, through R5. The use of separate output links results in uniform coupling to the amplifier when either L13 or L14 is served as the active plate inductance. LC values for the link circuits have been adjusted for working into 52-ohm cable and will require some modification if the line (52-ohm cable) is not terminated in its characteristic impedance. Unfortunately, it is not possible to recommend a given set of LC values that will match all types of mobile antennas over an 8-band range.

A small amount of cathode bias, developed across R11, holds the cathode current of the amplifier tube to a safe value when excitation is either abnormally low or absent during testing, etc.

One half of a Type 12AU7 is used in the grounded-grid input circuit of the audio equipment. The Class A driver uses the second section of the dual triode and is transformer-coupled to a 6N7 Class B modulator. Microphone voltage is obtained by connecting the carbon microphone (through J5) in series with the cathodes of the 12AU7.

Plate current for the oscillator, intermediate, plate inductance. LC values for the link circuits have been adjusted for working into 52-ohm cable and will require some modification if the line (52-ohm cable) is not terminated in its characteristic impedance. Unfortunately, it is not possible to recommend a given set of LC values that will match all types of mobile antennas over an 8-band range.

A small amount of cathode bias, developed across R11, holds the cathode current of the amplifier tube to a safe value when excitation is either abnormally low or absent during testing, tuning, etc.

One half of a Type 12AU7 is used in the grounded-grid input circuit of the audio equipment. The Class A driver uses the second section of the dual triode and is transformer-coupled to a 6N7 Class B modulator. Microphone voltage is obtained by connecting the carbon microphone (through J5) in series with the cathodes of the 12AU7.

Plate current for the oscillator, intermediate, plate inductance. LC values for the link circuits have been adjusted for working into 52-ohm cable and will require some modification if the line (52-ohm cable) is not terminated in its characteristic impedance. Unfortunately, it is not possible to recommend a given set of LC values that will match all types of mobile antennas over an 8-band range.

A small amount of cathode bias, developed across R11, holds the cathode current of the amplifier tube to a safe value when excitation is either abnormally low or absent during testing, tuning, etc.

One half of a Type 12AU7 is used in the grounded-grid input circuit of the audio equipment. The Class A driver uses the second section of the dual triode and is transformer-coupled to a 6N7 Class B modulator. Microphone voltage is obtained by connecting the carbon microphone (through J5) in series with the cathodes of the 12AU7.

Plate current for the oscillator, intermediate, plate inductance. LC values for the link circuits have been adjusted for working into 52-ohm cable and will require some modification if the line (52-ohm cable) is not terminated in its characteristic impedance. Unfortunately, it is not possible to recommend a given set of LC values that will match all types of mobile antennas over an 8-band range.

A small amount of cathode bias, developed across R11, holds the cathode current of the amplifier tube to a safe value when excitation is either abnormally low or absent during testing, tuning, etc.

One half of a Type 12AU7 is used in the grounded-grid input circuit of the audio equipment. The Class A driver uses the second section of the dual triode and is transformer-coupled to a 6N7 Class B modulator. Microphone voltage is obtained by connecting the carbon microphone (through J5) in series with the cathodes of the 12AU7.

Plate current for the oscillator, intermediate, plate inductance. LC values for the link circuits have been adjusted for working into 52-ohm cable and will require some modification if the line (52-ohm cable) is not terminated in its characteristic impedance. Unfortunately, it is not possible to recommend a given set of LC values that will match all types of mobile antennas over an 8-band range.

A small amount of cathode bias, developed across R11, holds the cathode current of the amplifier tube to a safe value when excitation is either abnormally low or absent during testing, tuning, etc.

One half of a Type 12AU7 is used in the grounded-grid input circuit of the audio equipment. The Class A driver uses the second section of the dual triode and is transformer-coupled to a 6N7 Class B modulator. Microphone voltage is obtained by connecting the carbon microphone (through J5) in series with the cathodes of the 12AU7.

Plate current for the oscillator, intermediate,
amplifier and modulator circuits and grid current for the final may be observed by switching the 0-100 ma. meter across metering resistors $R_6$, $R_5$, $R_{10}$, $R_{13}$ and $R_{17}$.

The starting switch, $S_8$, of the control circuit is connected in series with the field winding of $K_1$. With the contact arms of $K_1$ closed, 6 volts d.c. is connected to the heater chain of the transmitter and to one end of the field winding of the antenna change-over relay, $K_2$. The other end of the winding for $K_2$ is returned to the microphone jack and, in turn, to ground through the microphone push-to-talk switch. A pair of control leads are connected between $K_2$ and Prong 3 and 4 of $J_2$ so that an external power-supply relay may be easily connected to the rig.

**Construction**

Construction of the transmitter involves a fair amount of metal work, the sections to be cut and bent being made from flat pieces of $\frac{1}{16}$-inch aluminum stock. The panel is 87½ inches wide, 72½ inches high, has a half-inch fold at the bottom for fastening to the plate of the Bud C-903 cabinet, and a cut-out at the top right-hand corner that measures 3½ by 4½ inches. The chassis measures 5½ by 8½ inches and has a half-inch lip which bolts to the panel. The above-deck shield between the amplifier and the exciter section has half-inch lips bolted to the panel and the chassis and has depth and height of 5½ and 4½ inches, respectively. The partition which runs from front to rear of the unit (bottom view) measures 3 by 5 inches and has a half-inch lip bolted to the chassis. The distance between the partition and the end of the chassis is 2½ inches. The shield that mounts just to the rear of the oscillator coil is 1¼ inches high and 2 inches wide, and has a lip attached to the partition. A bracket measuring 2 by 3 inches supports the coils for the intermediate amplifier and the rear end of band-switch $S_8$. This bracket is bolted to both the partition and the chassis.

Although the chassis-panel assembly should not be bolted to the flat cabinet plate at the start, it is wise to go ahead with the drilling and tapping that will be required. The square support rods which will go to the rear of the chassis should be drilled and tapped for 6-32 machine screws at both ends. Holes for No. 6 screws should be drilled at the

### COIL CHART

<table>
<thead>
<tr>
<th>Coil</th>
<th>Taps</th>
<th>CTC Type</th>
<th>Turns Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_1$</td>
<td>7.0</td>
<td>LS3-10</td>
<td>none</td>
</tr>
<tr>
<td>$L_8$</td>
<td>5.0</td>
<td>LS3-30</td>
<td>10</td>
</tr>
<tr>
<td>$L_9$</td>
<td>7.0</td>
<td>LS3-10</td>
<td>10</td>
</tr>
<tr>
<td>$L_{10}$</td>
<td>14.0</td>
<td>LS3-30</td>
<td>8</td>
</tr>
</tbody>
</table>

$L_{11}$ - 1 turn No. 12 enam., wound around ground end of $L_{10}$.

$L_{12}$ - 1 turn No. 12 enam., 1¼-inch diam., mounted on tie point so as to encircle ground end of $L_{13}$-$L_{14}$ assembly.

### AMPLIFIER COILS

<table>
<thead>
<tr>
<th>Coil</th>
<th>Use</th>
<th>Freq.</th>
<th>$N_o$</th>
<th>$T_w$</th>
<th>$W_r$</th>
<th>$S_i$</th>
<th>$D_i$</th>
<th>$L_i$</th>
<th>$B_i$</th>
<th>$W_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_1$</td>
<td>plate</td>
<td>1.8</td>
<td>401½</td>
<td>5</td>
<td>1</td>
<td>1½</td>
<td>3012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$L_{12}$</td>
<td>link</td>
<td>1.8</td>
<td>33½</td>
<td>1½</td>
<td></td>
<td></td>
<td>3004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$L_{13}$</td>
<td>plate</td>
<td>14.0</td>
<td>12½</td>
<td>20</td>
<td>½</td>
<td>3</td>
<td>3011</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$L_{14}$</td>
<td>link</td>
<td>14.0</td>
<td>8½</td>
<td>18</td>
<td>1½</td>
<td></td>
<td>3003</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** $L_1$ for 1.8 Me. is wound on outside of Millen type 45004 form. $L_{12}$ for 3.5 Me. and both $L_{13}$ coils fit inside 45004 form. All $L_1$ and $L_{14}$ coils mount inside Millen type 45005 forms. B & W numbers refer to Barker & Williamson Inductor coils.
rear corners of the chassis and in the fold-over at the bottom of the panel, and holes for screws through to the support posts and the panel should be drilled in the flat plate that comes with the cabinet. The locations of this last group of holes must be such that the panel of the r.f. unit will be set back 1½ inches from the front edge of the plate when the final assembly is completed.

The photographs show how the components are mounted on the panel, base and partitions. \( C_{14} \) and the slug-tuned coils should be mounted after the wiring of the sockets and smaller parts has been completed. The 1.8-Mc. inductor for the intermediate stage is supported at the ground end by a small feed-through bushing mounted in the switch-coil bracket; a second bushing, mounted in the long partition, carries the r.f. lead from \( C_{14} \) to the amplifier grid coupling capacitor. This capacitor, \( C_{15} \), mounts directly between the amplifier side of the bushing and the grid prong of the tube socket.

The bottom view also shows how the coaxial leads between the coils and \( S_{20} \) are run through the chassis to the rear of the switchboard. The 75-ohm line between \( L_{11} \) and \( L_{12} \) enters and leaves the compartment through rubber grommets.

The layout for the components mounted on the bottom of the case is quite critical, and the exact placement of each part will depend considerably on how the main section has been put together. Mounting holes for the jacks, switches, etc., should be marked after the finished r.f. assembly has been positioned on the plate. After drilling and mounting the parts, the plate and chassis can be bolted together and the remaining wiring completed.

**Coils**

Coils \( L_{13} \) and \( L_{14} \) for the r.f. amplifier, with one exception, use \( \frac{3}{4} \)-inch diameter Miniductor mounted inside the forms. The 1.8-Mc. coil is the exception, and this one is close-wound on the outside of the form. This same coil does use \( \frac{3}{4} \)-inch Miniductor for the coupling link, \( L_{14} \), however. Coupling links \( L_{14} \) and \( L_{18} \) for the other assemblies use \( \frac{1}{2} \)-inch Miniductor which is fitted down inside the \( \frac{3}{4} \)-inch diameter plate coils. The links are positioned in the forms so that the bottom and the top ends will connect to \( C_{20} \) and \( S_{20} \), respectively, when the coils are inserted in the sockets. Be sure to cover the ends of the links with spaghetti before mounting them in the forms.

**Testing**

A standard a.c. supply capable of delivering 300 volts at 200 ma. may be used for bench testing of the transmitter. The filament drain is 3.35 amp and a 6.3-volt transformer may be used, providing the a.c. is not applied to the control relays. If complete a.c. operation is planned, it is necessary to hold the antenna relay, \( K_2 \), in the transmit position with a wedge of cardboard.

A 25-watt lamp bulb connected to \( J_5 \) will serve as a dummy load for the amplifier. \( S_3 \) and \( S_4 \) must be opened and closed, respectively, before testing is started. Set the excitation control to the zero-voltage position and, assuming that a 1.8-Mc. crystal is available, set \( S_1 \) and \( S_2 \) at the appropriate positions. \( L_{13} \) for 1.8 Mc. should be plugged into the final amplifier and \( S_5 \) should be set for reading oscillator plate current.

An accompanying tuning chart lists band-switch and tuning dial positions, plate and grid currents that indicate normal operation of the r.f. stages, and output frequencies that may be obtained with a given crystal. When lining up the transmitter, the following procedure is recommended:

Tune the oscillator for resonance at 1.8 Mc. Only \( C_8 \) requires adjustment in this case inasmuch as the plate circuit employs an r.f. choke rather than a slug-tuned coil. Next, switch the meter to Position 2, advance the excitation control, and adjust the tuning control for the intermediate stage as listed in the tuning chart. Set \( S_5 \) at the amplifier-grid position and adjust the slug of \( L_8 \) for maximum amplifier grid current. Readjust \( R_8 \) to deliver 7 or 8 ma. to the grid and then tune the final for resonance by means of \( C_{19} \). \( C_{20} \) should now be varied (keep the amplifier

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in resonance by retuning $C_{10}$ when necessary) until the 25-watt lamp loads the final to the value of plate current listed in the chart. If the rated plate current cannot be obtained, or if the amplifier appears to be too heavily loaded, it is necessary to readjust the position of the output coupling link with respect to the plate inductor.

The tuning procedure for 3.5 through 50 Mc. is, with one exception, identical to that already outlined. At any of these frequencies it is necessary to start off with $C_9$ adjusted as given by the tuning chart instructions and then slug-tune the oscillator coil to resonance. It should also be observed that when crystals for 3.5 Mc. and above are employed, it is possible to operate the intermediate stage either as an amplifier or frequency multiplier, thus the output stage may be worked straight-through on more than one band without first resetting the bandswitch.

The original amplifier was perfectly stable at all frequencies outside the 14-28 Mc. range. The link used to prevent self-oscillation in this region is adjusted as follows: Remove the load from the final, switch $S_1$ to the VFO position (make sure an external oscillator is not connected to $J_1$), close $S_2$ and back off the excitation control. Now, adjust the coupling between $L_{10}$ and $L_{11}$ to prevent self-oscillation. Stability is indicated by the absence of grid current at any setting of $C_{10}$ and by a steady amplifier plate current of approximately 40 ma.

The speech equipment and the relay circuit can be properly tested only with 6-volt d.c. fed to the transmitter through $J_7$. The regular mobile plate supply should be connected to Terminals 1 and 2 of $J_9$ and the supply may be turned on and off by means of a relay cabled to Terminals 3 and 4 of the same connector. With a microphone plugged into $J_9$, with $S_4$ open, and with a dummy load at $J_9$, the transmitter heaters may be turned on by closing $S_5$. After a few seconds of warm-up time the entire transmitter can be activated by the push-to-talk switch and a quick check of the various meter readings should be made immediately. Plate current for the modulator should idle at approximately 30 ma. and should rise to 60 or 70 ma. when voice modulation is applied. If the output lamp shows a distinct increase in brilliance during this last test, it is a fairly good indication that all is well.

In closing, we should like to direct a few words to those readers who like the transmitter but have no need for 8-band coverage. This group can simplify both the circuit and the construction of the rig by settling for 6-band operation. If output at 1.8 and 50 Mc. is sacrificed, it is possible to eliminate four of the exciter coils, all of the plug-in features and quite a bit of metal work. $L_1$, $L_9$, $L_9$ and $L_{10}$ need not be installed in the oscillator and the intermediate stages, and $L_{12}$ through $L_{14}$ for 1.8 and 50 Mc. will not be required. It will take little ingenuity to redesign the amplifier layout so that the plate coils and the output link may be permanently mounted below the chassis. If this is done, it will not be necessary to install the plug-in coil sockets, the shield "above deck" and the cut-out at the top corner of the panel.

The bottom section of the r.f. amplifier is separated from the exciter circuits by an aluminum partition. $RFC_4$, $R_9$, and $R_{11}$ are supported by a tie-point strip at the rear of the partition and $R_9$ is connected between the tube socket and the tie point at the rear of the base. $RFC_5$ is fastened to an aluminum bracket bolted to the chassis. The insulated tuning rod for $C_{20}$ shown in this view was later replaced by a flexible shaft so that the loading could be controlled from the front panel. The amplifier tuning capacitor, $Q_{18}$, is mounted on the chassis directly under the 3/4-inch holes that clear the leads between $C_{16}$ and the coil sockets.
TVI Reduction in Strong-Signal Areas

Simple Measures for the City Dweller

BY NEIL JOHNSON, W2OLU

Some time ago we had a little TVI. It really wasn't too bad, but some of the neighbors objected to it. Not owning a TV receiver at the time, we couldn't sympathize with them entirely, but we set about to eliminate or minimize the trouble. Of course, we have our own 20-inch job by now and, likewise, the TVI is entirely gone. This has been a rather gradual sort of evolution, rather than anything really drastic, so this is offered in hope that some other ham, similarly located, may find an easy way out.

The rig at W2OLU is a metal-breadboard type, with push-pull 241s in the final. The 7/14-Mc. driver unit is a converted BC-457, modified according to April, 1949, QST. The whole rig, with the exception of the high-voltage power supply and Variac is built on the aluminum chassis, 11 by 17 by 2 1/2 inches. Ham radio means various things to different OMs. To us it has meant experimentation and fine QSOs, rag-chews and so on. To continue the QSOs we had to clean up the TVI, or most of it. But to experiment, well, we just couldn't see taking a can opener to open up the rig for band-changing. Experimentation under

* 10 North 10th Ave., Mt. Vernon, N. Y.

- When TVI first reared its ugly head the city apartment dweller was the one most affected. However, that picture has changed with the increase in power, as well as number of stations, in metropolitan areas. This article serves to illustrate the simple measures that may be adequate to eliminate TVI if you're a city dweller, particularly if you can get along without 10 meters.

On the screen was a small TV, which was emitting a lot of TVI, and the operator was using a can opener to open the TV receiver. This sort of construction would be impossible. In a nutshell, we wanted to keep our metal-breadboard type of construction, if at all possible.

The early TVI in the small apartment building where we live was no doubt a combination of harmonics from the rig, plus blanketing caused by receiver overloading and lack of preselection. With such a set-up, it was hard to tell where to begin. The first real clue came when we noted that TVI was less on a neighbor's set when the Variac was cranked up to give higher plate voltage on the final! The TV set was an expensive Philco projection job, and the TVI was bad on Channel 2 only. The TV antenna was pointed away from our antenna, and the downlead was coax to the TV receiver, hence no antenna effect. Quick figuring showed the reason for less TVI with higher power. Our VR-150 regulating the p.a. grid bias kept the bias voltage constant while we ran the plate voltage to the final from zero up to 1500 volts. At 600 to 800 volts, we were running roughly four times cut-off; at 1500 volts, the 150-volt bias represented a normal Class C

At 14 miles from the Empire State Building, W2OLU can operate this open 225-watt rig on 40 or 20 meters without QRN to his own TV receiver.

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bias of twice cut-off, approximately. The next step was to reduce the p.a. bias to 105 volts; it is now down to a VR-75, and our Class B efficiency on 40- and 20-meter c.w. is about 65 per cent for the tubes, with about 60 per cent overall efficiency for the stage.

By this time, a 7-Mc. "Harmoniker"-type half-wave filter had been installed in the Twin-Lead. This was some help, but when a nearby ham told us our 20-meter s.i.g. were almost as strong as the 7-Mc. fundamental, we were in a quandary. The filter was partly taken apart, checking each quarter-section with a grid-dip meter showed everything OK, so we put it back together and began to look around. Evidently, the a.c. line to the antenna change-over relay was by-passing some of the TVI harmonics from the a.c. line around the theoretical 80-dB. filter attenuation. Out went the relay! About this time, we removed a 0.002-μfd, 2500-volt plate by-pass condenser at the "cold" end of the plate r.f. choke, and replaced it with a 470-μfd. unit from one of the BC-375 tuning units. Connection to chassis was through a half-inch-wide strip of transcription aluminum, about 2 inches long.1 A 500-μfd. 10-kv. television condenser would serve as well, if not better.

Our TVI was down considerably by now, and checking on an RCA set next door (where we had cooperatively installed a high-pass filter our neighbor paid for) showed all channels in the New York area free from TVI, except Channels 5 and 2. Of the two channels, the interference was objectionable on Channel 2 only.

About this time, the XYL put her foot down. Result — one TV set for the family. I work at TV broadcasting all day, hence the one-sided enthusiasm in the family. Aside from an occasional show, the biggest asset the TV receiver affords the OM is peace of mind. With a very PB high-pass filter we made at home, our own QRM likewise showed up on 2 and 5 only. The high channels 7, 9, 11 and 13 were clean. So was Channel 4 for some unaccountable reason. The next step was to install 0.005-μfd. ceramic disk capacitors across all the a.c., d.c. and keying leads coming from the exciter. Also, we made up two coaxial condensers from approximately 12 inches (each) of RG-59/U coaxial cable. These were installed from the tank-condenser stator terminals to ground.

By now, all TVI had gone except on Channel 2. Running into a noninductive dummy load showed that the interference was missing under these conditions, so it was evident it was being radiated by the antenna, and being picked up by our TV antenna, located about 8 feet from one end of the transmitting antenna. Our p.a. tubes were drawing a few milliamperes of plate current at 1500 volts with only 75 volts of grid bias; so it was evident that we had Class B conditions here with low harmonic output. Our thoughts were then concentrated on the exciter unit. With a spare piece of Twin-Lead about 20 feet long, we formed a pick-up loop of one turn at one end, wrapped it with plastic tape for insulation and, with the other end connected to the TV-receiver terminals, it was used as a harmonic-detecting probe. The XYL acted as recorder, while the OM probed the exciter unit with key down. Our d.c., a.c. and key leads showed very low TVI levels, but the 1628 driver plate circuit showed a fair amount of harmonic output. It was also present at the final grids. A small wavetrap using a 20-μfd. APC condenser and 6 to 8 turns of wire wound on a fountain-pen barrel in the 1628 plate lead soon cured this. The TV receiver was normalised, and the off-the-air TVI was checked on dear old Channel 2. At full power — 225 watts on 7 Mc. — we were able to tune the herringbone pattern in and out on our 20-inch picture tube by adjusting the wavetrap. Similar results were obtained on 14 Mc. using a 20-meter "Harmoniker."

Some of our neighbors evidently don't believe in high-pass filter installations, so to convince the doubting few, I had the XYL call a few OWs in to view our television while the OM was on the air. As a final acid test, we privately ran our full-power output — about 140 watts of r.f. — into a dummy load mounted on top of the TV receiver. We then proceeded to wrap the TV receiver Twin-Lead twice around the dummy load. Still no QRM on any television channel, including Channel 2. In fact, the XYL doesn't even know when the transmitter is on the air.

P.S.: The final remains unshielded and we have not yet installed the By-pass capacitors in the a.c. line.

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1 Grammer, "By-passing for Harmonic Radiation," QST April 1951.

QST for

WSIVK made a clean sweep of the Los Alamos, N. Mex., Freshwater "ham family"—Phil, W5TOU; mom, WN5YBJ; and dad WN5WYP — on 20- and 40-meter c.w. May we suggest a WAP (Worked All Freshwaters) certificate with space for endorsement stickers should any other Freshwaters come along?
Class \( AB_1 \) Modulator for the Small Transmitter

40 Watts of Audio Output Using 807s and an "Economy" Power Supply

BY GEORGE GRAMMER,* WIDF

*Technical Editor, QST.

The modulator unit, shown here with the 6146 transmitter from December QST, has an audio power output of approximately 40 watts and uses 807s in Class \( AB_1 \). It is completely self-contained, with power supply and control circuits, on a 5 \( \times \) 10 \( \times \) 3-inch chassis.

The control switch, center, has four positions—off, test, 'phone, and c.w. Microphone connector and gain control are at the left; a.c. switches at the lower right. The two speech amplifier tubes are at the left front, followed by the 807s and the 5V4G to the rear.

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Fig. 1 — Circuit diagram of the Class $\text{AB}_1$ modulator using 807s.

$C_1$ — 100-$\mu$fd. ceramic.
$C_2$ — Dual 8-$\mu$fd. electrolytic, 450 volts.
$C_3$, $C_4$ — 0.0015-$\mu$fd. ceramic.
$C_5$ — 10-$\mu$fd. electrolytic, 25 volts.
$C_6$ — 470-$\mu$fd. ceramic.
$C_7$ — 0.002- to 0.004-$\mu$fd. paper, 600 volts.
$C_8$ — Dual electrolytic, 8 (A) and 16 (B) $\mu$fd., 450 volts.
$C_9$, $C_{10}$ — 30-$\mu$fd. electrolytic, 450 volts.
$C_{11}$ — 0.004-$\mu$fd. paper, 1600 volts.
$C_{12}$ — 0.1-$\mu$fd. paper, 600 volts.
$R_1$ — 2,2 megohms, $\frac{1}{2}$ watt.
$R_2$, $R_4$ — 0.1 megohm, $\frac{1}{2}$ watt.
$R_3$ — 47,000 ohms, $\frac{1}{2}$ watt.
$R_4$ — 1-megohm volume control, preferably log taper.
$R_5$ — 1500 ohms, $\frac{1}{2}$ watt.
$R_7$ — 10,000 ohms, $\frac{1}{2}$ watt.
$R_6$ — 1 megohm, $\frac{1}{2}$ watt.
$R_8$ — 1000 ohms, $\frac{1}{2}$ watt.
$R_{10}$ — 0.1 megohm, 1 watt.
$R_{11}$, $R_{12}$ — 20,000 ohms, 10 watts.
$R_{13}$, $R_{14}$ — 1 megohm, 1 watt.
$R_{15}$ — 0.47 megohm, $\frac{1}{2}$ watt.
$R_{16}$ — 15,000 ohms, $\frac{1}{2}$ watt (see text).
$R_{17}$ — 50 ohms, $\frac{1}{2}$ watt.
$R_{18}$ — 4,700 ohms, 1 watt.
$R_{19}$ — 35,000 ohms, 10 watts.
$R_{20}$ — 1000 ohms, $\frac{1}{2}$ watt (value not critical).
$F_1$ — 2-amp. fuse.
$I_1$ — Pilot light, 6.3 v., 150 ma.
$J_1$ — Panel-type microphone connector (Amphenol PC11M).
$J_2$, $J_3$, $J_4$, $J_5$ — Insulated 'tip' jack.
$J_6$ — Octal socket.
$L_1$ — 4.5 henrys, 50 ma., 300 ohms.
$L_2$ — 8 henrys, 100 ma., 375 ohms.
$S_1$, $S_2$ — S.p.s.t. toggle.
$S_3$ — 4-section, 5-position ceramic wafer switch (2 wafer), 4 positions used.
$T_1$ — Interstage audio transformer, center-tapped secondary, 10-ma. primary, total secondary-to-primary turns ratio 3 to 1.
$T_2$ — Adjustable-ratio modulation transformer, app. 30 watts (UTC CVM-1).
$T_3$ — Filament transformer, 6.3 v. at 1.2 amp.
$T_4$ — Power transformer, 350 v. each side c.t., 90 ma.; 5 v. at 2 amp.; 6.3 v. at 3 amp.
$B_{T1}$ — 22.5-volt battery (hearing-aid type used in modulator shown in photographs).
cost is not large the extra reliability is worth it. On the other hand, 6146s cost appreciably more; they will deliver much more power output in Class AB, but for modulating a single 807 or 6146 it is not needed.

According to the tube curves, an audio power output of approximately 45 watts can be obtained from a pair of 807s operating with a plate-to-plate load of 13,000 ohms. This is for a plate voltage of 600 and a screen voltage of 250. Measurements on the modulator shown here gave a power output of 42 watts (with negligible distortion as shown by an oscilloscope) with 620 volts on the plate and 225 on the screen. Although only a single-section filter is used in the modulator plate supply, measurement also showed the hum level to be 40 db. below full output. This ratio, which is thoroughly adequate by ordinary standards, is considerably better than the power supply ripple itself, and results from hum cancellation in the two halves of the modulation transformer primary, as well as from the fact that the 807s show very little change in plate current with a change in plate voltage.

**Circuit Notes**

The speech amplifier section uses a dual-triode 12AX7 as a two-stage resistance-coupled amplifier, followed by a single medium-µ triode transformer-coupled to the modulator grids. The cathode resistor, $R_6$, in the second triode section is left unby-passed to introduce some negative feedback, since the extra gain obtainable with a by-passed cathode resistor is not needed. A single pentode stage could be substituted for the double triode if desired.

The circuit diagram calls for a 6C4 in the stage feeding the 807 grids. It was originally intended to use a phase-inverter here, and a 12AT7 was installed for that purpose. However, the specifications on the 807 require a rather low value of grid-circuit resistance when resistance coupling is used, and this makes the gain of the preceding stage low. While it was possible to get enough driving voltage, it was found difficult to balance the phase inverter properly without having an oscilloscope available for its adjustment, so the simplest solution was to use only one section of the 12AT7 with transformer coupling to the 807s. A 6C4 is a somewhat less expensive replacement for the 12AT7. Any inexpensive audio transformer can be used.

Battery bias for the 807s also was found to be the easiest way. We did not want to sacrifice plate voltage by getting bias from a resistor in the negative lead, and an attempt at using a separate bias supply working from one side of the transformer was not satisfactory; without excessive current drain the regulation was too poor, resulting in a shift in bias when the 807 grids were occasionally overdriven into the positive region on peaks. The battery is a standard voltage — 22.5 volts — and since it does not carry current it will last its shelf life.

The frequency response of the amplifier has been doctored to put the maximum speech energy in the range where it contributes most to intelligibility. Maximum response is in the 500-1200 cycle range. On the low side, it is down 3 db. at 300 cycles, 6 db. at 200, and about 15 db. at 100 cycles. On the high side, the comparable figures are 4 db. down at 3000 cycles, 8 db. at 5000, and 15 db. at 10,000. By listening tests this is a satisfactory type of response, giving quite natural-sounding speech with sufficient highs for good intelligibility. The low-capacitance coupling condensers, $C_3$ and $C_4$, between the speech stages account for the low-frequency cut-off, while $C_4$ and $C_7$, across the secondaries of the modulator grid coupling and output transformers, respectively, cut the highs.

Although the modulator can be used with any transmitter running an input of up to 80 watts (total input to plate and screen, in the case of a tetrode r.f. stage) by using the two upper sections of Fig. 1 and ignoring the lower one, it has been constructed as a companion unit to the transmitter described in the December issue. The lower section of the circuit provides the interconnections between the two units, the control circuits necessary for regular operation, and means for checking the plate-supply voltages and modulator plate current, using the meter built into the r.f. unit. It also includes provision for taking off a small amount of audio for operating an oscilloscope, in case one is available.

**Construction**

The entire modulator, including speech amplifier, power supply, and control circuits, is built in a 5 × 10 × 3-inch chassis. The construction is, perhaps, unnecessarily compact, and since there is very little about the layout that requires careful attention to placement of parts it could be built on a larger chassis with somewhat less trouble in construction. In the construction shown all the available chassis space, including walls, has to be utilized. Although it may look crowded and difficult to service, all of the larger units mounted on the chassis walls easily can be removed, with leads intact, to get at the components underneath.

Only two points about layout and construction need mentioning. Originally, the heaters in the speech amplifier were connected up using twisted wires for the heater leads, with the center-tap of the filament supply winding on the power transformer grounded. As the hum seemed to be excessive, this was changed over to a single heater lead from tube to tube, with one heater terminal grounded at each tube socket. This reduced the hum to the point where it is negligible compared with the plate-supply hum in the modulator stage. The second point is probably more important: with the high voltage gain from the microphone input to the plates of the 807s — it is in the neighborhood of 50,000 with the gain control set for the average communications-type crystal microphone — it takes very little over-all feedback to cause oscillation. In this layout, the output transformer is quite close to the first speech stage — an undesirable arrangement but one

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In this view the baffle shield between the speech-amplifier section and the other circuit wiring has been removed to show the layout. The condenser in the left foreground is 1 μF, the dual electrolytic used for the decoupling circuits. The interstage audio transformer, T1, is at the center, mounted on the chassis wall. The bias battery is behind it, held in place by a small strip of metal. L1, the low-voltage supply filter choke, is at the right. The cable socket and pin jacks are on the rear chassis wall.

On the top of the chassis, left to right, are the modulation transformer, bleeder resistors, R17 and R18, for the high-voltage power supply, the 6X5GTs, and the power transformer. The bleeder resistors are mounted vertically, using lengths of threaded rod running through the resistor tubes.

Operating Data

As stated above, the optimum load for Class AB1 807s operating at these voltages is about 13,000 ohms. The modulation-transformer primary-to-secondary turns ratio should be selected to give this plate-to-plate load when the actual load is connected to the secondary. The actual load resistance will, of course, depend on the plate voltage-plate current ratio of the modulated amplifier, it being understood that where a tetrode is modulated the screen current should be added to the plate current when a screen-dropping resistor is used.

For example, with a 6146 the plate and screen current, using a 35,000-ohm screen-dropping resistor, will total about 120 ma. with 600 volts on the 6146 plate, when the operating conditions are set for best modulation. This represents a load resistance of 5000 ohms, so the impedance ratio, primary to secondary, is 2.6 to 1. The nearest value available should be selected by means of the taps on the particular modulation transformer used. It is seldom possible to come out with the exact figure required, but a variation of ±10 per cent or so in the reflected plate-to-plate load will not be serious.

In the case of the transmitter described in December QST, the rated plate input of 67.5 watts resulted when the antenna loading was adjusted to give a plate current of 106 ma., at which value the d.c. voltage at the plate measured 640. The screen current was 12 ma., giving a total current of 118 ma. and a load resistance of 5300 ohms for the modulator. The tap numbers indicated in the diagram worked satisfactorily.

The d.c. power supply voltages in the modulator unit (120 volts from the line) measured 690 and 260 for the high and low supplies with no audio input. The modulator idling current is about 50 ma. under these conditions with a new 22.5-volt (actual voltage 24.5 volts) battery for bias. With tone input and the gain adjusted for maximum undistorted output, the voltages drop to 620 and 225, respectively. The modulator cathode current is about 100 ma. at full output. However, with speech waveforms it was found by tests with an oscilloscope that the modulator plate current should not kick beyond 60 to 65 ma. on voice peaks; this represents 100 per cent modulation. Under these conditions the average supply voltages, with speech, are very nearly the same as the values with the modulator idling.

Interconnections and Control

As stated earlier, the lower section of Fig. 1 applies particularly when the modulator is to be used with the transmitter shown in December QST. The switching arrangement in this section does all the jobs necessary to serve as an on-off control for 'phone, for disabling the modulator when c.w. is to be used, and providing the same type of test position that was incorporated in the original transmitter.

The control switch, S3, is a four-section ceramic-wafer type, four positions being used. In the "phone" position it disconnects the 6146 r.f. amplifier screen from the supply in the transmitter unit and connects it to the screen-dropping resistor, R18. Simultaneously, the secondary of the modulation transformer is connected in series with the 6146 d.c. plate lead, and the cathodes of the 807 modulators are connected to ground through R16. The drop in voltage across R16 is used for measuring the modulator plate current. In the "C.W." position the modulator cathode circuit is opened, the secondary of the modulation transformer is short-circuited, and the 6146 screen is connected to the screen supply in the transmitter unit. In both the "Test" and "Off" positions the 6146 screen is disconnected from its supply and grounded, and the modulation transformer secondary is shorted. If a key
is plugged into the jack on the transmitter, either position can be used for testing; the key must, of course, be open when using the "Off" position for on-off phone switching.

A few changes in the original transmitter circuit are required. Referring to the circuit diagram on page 24 of the December issue, these are:

1) Disconnect the lead between the arm of \( S_{4a} \) and \( J_7 \). This section of \( S_4 \) is no longer needed.

2) Remove \( R_5 \) from the circuit. (This resistor is replaced by \( R_{17} \) in Fig. 1 herewith.)

3) Connect the now-vacant Pin 2 on the auxiliary socket, \( J_6 \), to the top contact of \( J_7 \). This connects the 5763 and 6146 cathodes to the auxiliary socket and hence through the connecting cable to the modulator, where they can be switched along with the modulator cathodes.

These changes are all that are necessary. However, two other changes are recommended. In testing the transmitter-modulator combination it was considered that the hum introduced by the transmitter plate supply was a bit greater than some might find acceptable. The original filter is a single-section affair having an output capacitance of only 8 \( \mu \)fd., which is adequate smoothing for c.w. Substituting 40-\( \mu \)fd. 450-volt units for \( C_{26} \) and \( C_{11} \) effected enough of an improvement to make the hum inaudible. The second change is to mount the resistor \( (R_5) \) removed from the transmitter on the jumper plug, connect it between Pins 1 and 3, and remove the jumper between Pins 1 and 2. This restores the transmitter alone to its original circuit, so far as c.w. operation is concerned, and thus makes it independent of the modulator simply by pulling out the cable plug and inserting the jumper plug.

A six-wire cable completes connections between the two units. The same pin numbers are used for corresponding circuits at each end, so it is merely necessary to connect Pin 1 in one plug to Pin 1 in the other, and so on. Pins 5 and 6 must be connected by a jumper—preferably one in each plug, so it will not make any difference which plug is inserted in which unit—in order to complete the heater circuit in the transmitter.

The meter in the transmitter is used for making measurements on the modulator by means of a cord with pin jacks running between the "External Voltmeter" jack on the transmitter and the jacks (\( J_2 \) to \( J_6 \), inclusive) shown in Fig. 1. Modulator plate current is read through \( J_4 \); the full scale range is 100 ma. with a 50-ohm resistor at \( R_{18} \). A.f. voltage for an oscilloscope can be taken from \( J_9 \), through the voltage divider formed by \( R_{15} \) and \( R_{19} \). \( C_{11} \) is a blocking condenser for the voltage divider. The ratio of \( R_{15} \) to the total resistance is such as to give about 10 volts peak, which is ample for a scope having a horizontal amplifier. Where more voltage is required for sufficient deflection, it can be obtained by increasing the value of \( R_{15} \).

\( C_{12} \) and \( R_{20} \) are used to suppress sparking at the control switch when going from "Phone" to "Off." The inductive discharge of the modulator transformer secondary gives a high-voltage "kick," on opening the cathode switch, that is absorbed in the condenser. \( R_{20} \) slows down the discharge of \( C_{12} \) when closing the cathode circuit and thus reduces the sparking on "make."

\textbf{Operating the Combination}

When the transmitter and modulator are connected by the cable all the control functions, ex-

\textit{(Continued on page 128)}
The Seventh A.R.R.L. National Convention
Houston, Texas—July 10-12, 1953

BY CHARLES FERMAGLICH,* W5FJF, AND WALDO TOWNLEY,* W5FEK

Grab your ten-gallon hat and boots, pardner, and get ready for a visit "Deep in the Heart of Texas." The Houston Amateur Radio Club (to be referred to as HARC) hereby officially announces the end of the Civil War. You all who have been wanting to visit fabulous Texas can now do so without the danger of being shot as a damyankee, if you attend the Seventh National ARRL Convention in Houston, Texas, July 10-11-12. Convention headquarters corral will be at the world-famous Shamrock Hotel.

You may see some Confederate flags and hear a few rebel yells, but the entire HARC has united to put on one of the finest conventions of all times and in true Texas tradition. Houston, the South's largest city, is well suited as the site of the first ARRL National ever to be held in the South. There are many fine places of entertainment, excellent hotel and motel facilities, and it will be an opportunity to see that part of Texas that Texans brag about so much. Galveston, with its famed beach, is only 30 minutes' drive from Houston over the new Gulf Freeway. The world-famous San Jacinto Battleground, where one of the most decisive battles in world history was fought, with its museum of historical importance and towering 570-foot monument, is worth a visit. Here, also, is moored the battleship Texas. Fort Houston, the nation's No. 2 port, with its busy wharves, will be of interest to many visitors.

Over 30 committees, headed by Dr. Charles Fermaglich, W5FJF, have been working for over a year to organize and execute a convention that will appeal to amateurs in every phase of the game. Many of the leading manufacturers and distributors of the nation will have display booths in the Hall of Exhibits at the Shamrock. One booth will be set up as a "swap shop" for amateurs who wish to "horse-trade" for amateur gear with other hams. So bring along equipment that you would like to trade for something else. Orin B. Gambill, W5W1, Fifth District QSL Bureau Manager, will have his complete file of Fifth District QSL cards on hand. All MARS nets will be represented and military equipment will be on display, including the new radiotele-

type circuits. A ham television station will be in operation and the Teletype Society will demonstrate ham teletype. A number of ham stations will be in operation to handle traffic.

Many contests, with worth-while prizes, are being planned. Among them are: QSL card, frequency guessing, tone guessing, gadgets, tall tales, tube identification, code speed, amateur gear photos, and others. There will be a display of mobile rigs and a prize awarded to the best.

For the mobile boys there will be an excellent 75-meter hidden transmitter hunt, with a prize for the winner. So bring your best direction-finding equipment with you. Houston is located on the coastal plains of Texas, but the transmitter will be well hidden.

A "convention-within-a-convention" is being planned for the v.h.f.-u.h.f. gang, with W5FEK, Waldo Townley, in charge. Ed Tilton, W1IDQ, will head the list of featured speakers. Cal Hadlock, W1CTW, will give a talk on 220 Mc.; he will also explain the advantages of 6 meters for civilian defense. W5AYU, B. D. Lee, will go into the design and construction of 450-Mc. gear. Bill McNatt, W5FEW, ex-W9NFK, has promised one of his interesting talks. A tape recording of W4AO's and W3GKP's 2-meter lunar DX will be played. An informal luncheon is slated for Saturday, at which time the second annual awarding of plaques to the outstanding v.h.f. men of Texas, Oklahoma and New Mexico takes place. A number of contests are being planned for the v.h.f. group and will be announced in Ed Tilton's column, "The World Above 50 Mc.," in next month's QST.

Brad Beard, W5ADZ, well-known DXer, who has more than 200 countries confirmed, heads the program for the DX hounds. There will be two and one half hours of DX discussion, plus a luncheon. One of the nation's best DX men will be the featured speaker.

A luncheon for all teenagers is in the works and a plaque will be awarded to the outstanding West Gulf Division ham under 21 years of age. The ladies have not been overlooked. Arrangements have been made for a YL ham luncheon. A tea and luncheon is scheduled for all of the ladies. In the past, many prizes won by the ladies were suitable only for the OMs, but the ladies' committee, under the chairmanship of Mrs. Charles Fermaglich, has purchased a large number of valuable awards selected for the ladies.

"Over 30 committees... have been working for over a year to organize and execute a convention that will appeal to amateurs in every phase of the game."

QST for
alone. In addition to the special ladies’ functions, there will be a semiformal dance Saturday night in the Crystal Ballroom of the Rice Hotel and a full-course banquet at the Rice on Sunday for both the ladies and men.

Thursday evening, July 9th, there will be an optional preconvention dinner party for those who arrive early enough to participate. This will be a grand time to get acquainted in an informal atmosphere. This event will be $2.00 per person. Kenneth Perron, W5JYM, is chairman.

On Friday, July 10th, the registration desk will open at 8 a.m. at the convention headquarters at the Shamrock. All technical meetings and displays will be held at the Shamrock Hotel, as well as some of the social functions. Other entertainment will be held at the Rice Hotel, another of Houston’s famed hotels. All room reservations should be made well in advance, directly with the hotels. Rates and hotels: Shamrock, single $6.00 up, double $8.00 up; Rice, single $4.50 up, double $6.50 up; Lamar, single $4.00 up, double $6.00 up; Texas State, single $3.50 up, double $5.50 up; Ben Milam, single $3.50 up, double $4.50 up; Montagu, single $3.50, double $6.00 up. Motels in the vicinity of the Shamrock are Alamotels, $4.00; Carlon Courts, $4.00; Chief Motel, $3.00; Clover Leaf Motel, $4.00; Grace Courts, $3.00; Grant Motel, $5.00; King Motel, $5.00; Las Banderas Courts, $5.00; Motor Inn Hotel, $3.00. Houston is called the most thoroughly air-conditioned city in America.

The rest of Friday will be devoted to general sessions of interest to everyone. Some of the well-known speakers already scheduled are Commissioner George Sterling of FCC, John L. Reimann, Phil Rand, E. W. Pappenfus, A. H. Linne, C. V. Clark, Don Norgaard and G. S. Bradford. Talks will be given by Army and Air Force MARS personnel; a lecture on transistors is scheduled and many more are planned.

The entertainment for Friday night has been left open as there are many fine restaurants and night spots that folks will want to visit. A list of suitable entertainment will be available.

Saturday morning, special group sessions will start at 9:30 o’clock and last through luncheon. These various lectures will run concurrently.

The ARRL business meeting will begin at 2 p.m. with President Dosland presiding. Many of the Headquarters gang will be present as well as a number of division directors and ARRL officers. Many important matters will be discussed. There will be a special meeting of representatives of ham nets and also a meeting of SCMs and emergency coordinators.

The semiformal dance in the Crystal Ballroom of the Rice Hotel will be held Saturday night. An excellent orchestra has been engaged.

Sunday morning will be taken up with the “swap shop” and more technical talks. The Sunday afternoon banquet, at which a minimum amount of speech-making is scheduled, will conclude the formal convention.

Numerous sight-seeing trips are being planned for those who wish to take advantage of them and a list will be available. Babysitters will also be available. One of the postconvention highlights will be an enjoyable nine-day Mexico City tour. The Mexican government has prepared a very interesting all-expense tour, including rail travel, first-class hotels, good meals and wonderful sightseeing trips, all for as little as $162.25 per person. All interested contact Mr. F. Alatorre, General Agent, National Railways of Mexico, 2401 Transit Tower, San Antonio, Texas.

Registration for the convention is $13.50 per person. The preconvention dinner party, July 9th, is optional and will be $2.00 per person. All checks and money orders should be made payable to the HARC Inc. Convention Committee, and sent to P.O. Box 10173, Garden Oaks Station, Houston 18, Texas. In order to be eligible for the preregistration award, you must have your registration blank in the mail before midnight, June 18, 1953.

For any further information you may contact the Convention Chairman, Dr. Charles Fermaglich, W5FJF, at 618 Medical Arts Bldg., Houston 2, Texas.

See you in Houston in July!

* "The ladies have not been overlooked. Luncheons . . . teas . . . dances . . . sightseeing . . . banquet. . . ."
A Single-Control Transmitter-Receiver

Building a Unique 7-Mc. System Around a BC-453

By Gus Treuke,* W6DSR

A short while ago the writer decided to give the 40-meter band a whirl after an absence of many years. A compact transportable arrangement, preferably with receiver and transmitter combined in one unit, was decided upon. Because of the selectivity it could afford for reception, a BC-453 was acquired. For the receiver portion, two broadband r.f. stages and a converter with its oscillator section crystal controlled at 6800 kc. were built into the BC-453 chassis. The 6800-kc. crystal heterodynes the 7.0- to 7.3-Mc. band to 200-600 kc. The latter thus becomes a variable first i.f. to which the BC-453 dial (the only tuning control) is adjusted. Room was also found on the chassis for a simple crystal-controlled transmitter, and things seemed pretty well sewed up.

Operating crystal-control on a single frequency for several practically QSO-less days reduced the writer to a SWL’s existence and convinced him that VFO was the only answer to his dilemma. While in this rôle, the writer could not help but admire the extreme stability of the receiver arrangement, and this started him musing upon the possibility of using the local oscillator of the BC-453 as a means not only of controlling the receiver’s frequency, but the transmitter’s as well. After a bit of mental gyration, it was discovered that the sum of the BC-453 oscillator’s

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* 2544 East 16th St., Oakland 1, Calif.

Inside view of the transmitter-receiver for 7 Mc. built by modifying a BC-453 low-frequency receiver. The components for the pi-section tank that forms the transmitter output circuit and receiver input circuit are above the 2E26 final amplifier.
frequency (285 to 585 kc) and 6715 kc, always equals the frequency to which the receiver is tuned. A variable-frequency single-control transmitter-receiver thus seemed a definite possibility. After much experimenting, the arrangement shown in the block diagram of Fig. 1 was arrived at.

Receiver Circuit

Because its terminal arrangement is convenient, a 6F8G was chosen for the first r.f. stage. This is followed by a second r.f. stage in which a 12AT7 is employed as a cathode-coupled amplifier feeding the 6BE6 converter. The oscillator section of the 6BE6 uses a Pierce crystal circuit and, by means of a 6800-crystal, the 7.0-Mc. band is heterodyned to 200 to 500 kc. The tubes and components of these three stages are mounted on the rear deck originally occupied by the dynamotor power supply.

Because of the space factor and the need for a pentode Class A stage in the transmitter section, one section of a 5656 dual pentode was employed in place of the 12SK7 originally used in the single variable (200 to 500 kc) first i.f. stage. Also, in order to conserve space, a 6BE6 was chosen as the second converter. In the interest of maximum frequency stability, a separate tube (one section of a 12AT7) was employed as the local oscillator. The two 85-ke. i.f. stages, second detector and b.f.o. are unaltered except for the substitution of

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Fig. 1 — Block diagram of W6DSR's transmitter-receiver built around a BC-453 receiver.

Fig. 2 — Circuit of the 7-Mc. converter section.

C1 — 18-mfd. mica.
C2, C3, C4, C5, C6, C9 — 0.01-mfd. ceramic.
C4, C7 — 33-mfd. mica.
R1 — 2.7 megohms.
R2 — 390 ohms.
R3, R4, R5, R6 — 3300 ohms.
R7, R8 — 1 megohm.
R9, R10 — 100 ohms.
R11 — 220 ohms.
R12 — 22,000 ohms.
R13 — 25,000-ohm potentiometer.
L1, L2 — 40 turns No. 38 d.a.c., 3/4-inch diam., iron-slug form (CTC L5-3 form).
RFC4 — 2.5-mh. r.f. choke.
6-volt equivalents for the 12-volt tubes originally employed in the BC-453. The original straightforward 12A6 audio stage was discarded and a 6SN7, wired in as a peaked audio amplifier, was put in its place. The variable shown in the filter is a compression-type mica unit.

The pi-section tuner couples the antenna to both receiver and transmitter.

**The Transmitter**

In the transmitter section, the signal from the high-frequency oscillator in the BC-453 (285 to 585 kc.) is fed in at E', Fig. 4 to the grid of a buffer amplifier, then into a phase inverter and finally to the input of a 6J6 mixer where it is heterodyned with the output from a 6715-kec. crystal oscillator to produce the sum frequencies of 7000 to 7300 in the output of the mixer. It was necessary to employ a Class A stage between the receiver oscillator and the phase inverter in order to eliminate pulling of the VFO frequency when the crystal oscillator was keyed. One section of a 5656 performs this function.

The other triode section of the 12AT7 receiver-oscillator tube is employed as a phase inverter to feed the grids of the 6J6 balanced modulator (mixer) in push-pull fashion. Since the plates are connected in push-pull, the VFO signal would appear in the output of the mixer were it not for the fact that its frequency is remote from the frequency to which the mixer output is tuned. One section of another 12AT7 is employed with a 6715-kec. crystal in a Pierce circuit to drive both grids of the 6J6 in phase. Because of the push-pull plate tank, this 6715-kec. frequency is largely balanced out in the 6J6 plate tank and the main frequency appearing here is the frequency to which the receiver is tuned (7.0 to 7.3 Mc.). A bandpass circuit couples the output of the 6J6 into the cathode of the other triode section of the 6715-kec. crystal oscillator tube. This triode acts as a grounded-grid stage with its output coupled by means of a bandpass circuit into the grid of the 2626 final amplifier. The tubes and components of the 12AT7 crystal-oscillator grounded-grid amplifier, the 6J6 balanced modulator and the 2626 final amplifier are mounted on the dynamotor deck of the BC-453 chassis.

The bias developed by the transmitter's final amplifier is employed as a means of reducing the receiver's gain when the key is down. Enough 85-kec. signal is developed by the random mixing of the keyed 6715-kec. crystal oscillator and the 6800-kec. receiver's crystal oscillator to provide a comfortable audio beat with the h.f.o. Comfortable and complete break-in operation is possible along with a means of monitoring one's fist. The cathodes of the final amplifier, the 12AT7 buffer, the mixer and the crystal oscillator are keyed simultaneously through J1, Fig. 4.
Fig. 3 — Revised circuit of the BC-453. Values not marked on the diagram are the same as in the original. (See QST, September, 1948, for a discussion of the audio-filter circuit.)

Construction

Except for the pi-section tank circuit and plate-current meter, it was found possible to contain all the additional components in the original chassis without the aid of a shoehorn. A new case was built with a cupola on it in which are mounted the plate-current meter and pi-section tank circuit. These components are mounted directly above the 2E26 final amplifier and the 6F8G receiver first r.f. stage. These two tubes are mounted on the extreme rear end of the chassis. The socket for the 6F8G is mounted below the chassis so that the height of this tube above the chassis is no greater than that of the 2E26. Mounted on stand-offs over the unused octal sockets of the 12K8 mixer and 12SK7 r.f. stage is a strip of metal containing two nine-pin and one seven-pin miniature tube sockets. These sockets were wired and the wiring brought down through the keyholes of the two octal sockets. One of the nine-pin sockets is for the 5656 Class A buffer stage, while the other is for the 12AT7 HFO and phase inverter. The seven-pin tube socket is for the second 6BE6 mixer.

Adjustment

In the initial lining up of the receiver, the screen voltage was removed from the 2E26 transmitter final amplifier. The HFO was disabled by shorting to ground the oscillator section of the gang capacitor and the b.f.o. was disabled by shorting to ground the B+ terminal of the b.f.o. A vacuum-tube voltmeter was then connected to read the voltage at the junction of R19 and C23. With power applied to the rig, and with the key down, the three i.f. transformers were adjusted for maximum voltage indication. The short from the B+ terminal of the b.f.o. tank was then removed. With the 'phones plugged in and the key still down, the b.f.o. screwdriver adjustment was set for the desired best note. It was found necessary to adjust the r.f. gain control during the above procedure so as to get sharp indications of resonance. The short was then re-

- Believe it or not, with only a small expansion of the original BC-453 box, W6DSR has managed to develop a 7-Me. double superhet and a heterodyne-type VFO transmitter from the original circuit. The single dial controls the tuning of both transmitter and receiver. The transmitting frequency is always the same as the receiving frequency, unless a crystal of different frequency is substituted in the transmitter. This unique arrangement provides excellent frequency stability and receiver selectivity.

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Fig. 4 — Circuit of the transmitter built into the BC-453 chassis.

C1 — 400-μfd. variable (dual midget broadcast).
C2 — 140-μfd. variable.
C3, C5, C11, C16, C18, C20 — 0.0033-μfd. mica.
C4, C6, C8, C14, C19, C21, C22 — 0.01-μfd. ceramic.
C9, C10, C12 — 47-μfd. mica.
C7, C13 — 68-μfd. mica.
R1, R2 — 45-μfd. mica trimmer.
C15 — 33-μfd. mica.
C16, C17 — 39-μfd. mica.

2E26 12AT7 (1) 6J6

+300 V.

R1 — 2000 ohms.
R2 — 2000 ohms.
R3 — 1000 ohms.
R5 — 10,000 ohms.
R6 — 67,000 ohms.
R7 — 250 ohms.
R8 — 12,000 ohms.
R9 — 0.1 megohm.

L1 — 36 turns No. 26 enam., tapped at center, wound on 5/8-inch slug-tuned form, 3-turn link at cold end.
L2 — 40 turns No. 26 enam., tapped at center, wound on 5/8-inch slug-tuned form, 3-turn link at center.
L3 — Same as L2, wound on same type of form.

L4 — Open-circuit jack.
L5 — Pin jack for checking amplifier bias.
MA1 — D.c. milliammeter, 150-μa. scale.
RFC1 — V.h.f. parasitic choke (Ohmite Z-235).
RFC2, RFC3, RFC4, RFC5, RFC6 — 2.5-mh. r.f. choke.
moved from the oscillator variable capacitor and the key was let up. A signal generator, variable from 200 to 500 kc., was coupled to the input circuit of the original BC-453 r.f. stage while the padder capacitor, $C_9$, and the trimmer capacitor, $C_4$, were adjusted to bring the dial back into calibration. The signal generator was then connected between the antenna terminal and ground. With the b.f.o. disabled and the dial set at 7150 kc. (350 kc.) a modulated 7150-kc. signal was pumped into the receiver. Then the original r.f. and mixer stages and the slugs in the coils of the signal-frequency stages were set for maximum output as indicated on an output meter connected to the receiver’s output. The short from b.f.o. B+ to ground was then removed and the signal generator and output meter disconnected. An antenna was connected and ‘phones plugged in. A stable c.w. signal was tuned in. With $R_{21}$ adjusted for maximum, the audio-filter variable condenser was adjusted until the signal showed a tendency to ring. This completed the alignment of the receiver. The receiver is substantially single-signal and, with the above adjustments complete, the transmitter’s frequency will always be equal to the receiver’s wherever the receiver is tuned.

In the initial adjustment of the transmitter, a link of a couple of turns was temporarily soldered to the grids of the 6J6 balanced modulator. The screen voltage was still left off the 2E26. The 6715-ke. crystal was removed from its socket and the HFO was again disabled by shorting its variable capacitor. A variable-frequency oscillator that covered 7.0 to 7.3 Mc. was then coupled to the link and, with the key down, the four bandpass circuits were peaked up. It was found by staggering these circuits the 2E26 grid voltage would remain substantially flat over the 7.0- to 7.3-Mc. range and drop off sharply on both sides of the band. The link was then removed, the 6715-ke. crystal plugged in, and $C_{34}$ adjusted for minimum amplifier grid current. The short was then removed from the HFO capacitor. Then the final grid voltage was found again to remain substantially constant over the band. Screen voltage to the 2E26 was then applied and the station was ready to be put on the air.

In adjusting the pi-section tank, $C_1$ should be set first at maximum and the circuit tuned to resonance with $C_9$. If the plate current is less than normal, $C_1$ should be reduced and the circuit re-resonated with $C_2$.

On-the-air results have been excellent. The sensitivity, selectivity and stability of the receiver are excellent and reports received from all QSOs have been T9 or T9X.

Bottom view of the converted BC-453 low-frequency receiver.
Another Vacuum-Tube Keyer
And Some Tetrode-Keying Considerations

BY HOWARD F. BATES, KL7AQQ

The usual key-click, or "shaping," filter consists of a choke and a condenser and, while effective when you have found the right combination, it does require some large components if any appreciable current is being broken. One alternative is a vacuum-tube keyer, in which a vacuum tube, a few resistors and a condenser can do practically the same job. The vacuum-tube keyer is popular also because it is impossible to get any significant electrical shock at the key terminals of such a unit.

The problem at KL7AQQ was to key the 6AG7 crystal-oscillator stage that was used to drive a pair of 807's. When a conventional triode tube keyer was tried, too much of the available voltage was lost across the keyer tube, and an alternative was looked for. A pentode or tetrode seemed to be the obvious answer, and one was tried. It worked fine. With the values that were tried, the drop across the keyer tube was measured to be less than 10 volts.

Instead of adjusting the keying shape by the selection of \( R_4 \) and \( R_5 \) and the addition of a condenser from the 6V6 grid to ground, \( C_3 \) and \( C_4 \) were adjusted until the desired characteristic was obtained. This effect would be present in any event, since \( C_3 \) and \( C_4 \) are required for r.f. bypassing, and their capacities would contribute to the final result. By making \( C_4 \) small compared to \( C_3 \), the click on "break" is increased; conversely, by making \( C_3 \) small with respect to \( C_4 \), the click on "break" is reduced. The sum of both affects the "make" characteristic — the larger the sum, the softer the "make." Since the keying characteristic of a transmitter is a matter of personal preference, one should try different values than those shown, particularly if a different circuit or set of tube combinations is used. In this case it was found that the values of \( C_2 \) and \( C_4 \) should not differ by a factor of more than about 2 to 1; this might not be true if the circuit were used under different conditions.

The resistor \( R_3 \) may or may not be used, depending on the plate voltage in use. A screen by-pass condenser may increase the output, but it wasn't necessary in this application. A large screen by-pass will soften the "break" characteristic, and hence it is one other component that can be juggled for optimum keying. If a higher plate voltage is used, it is advisable to feed the oscillator screen grid from the same 150-volt source as the 6V6 screen, since otherwise the value of \( R_3 \) would become too large.

As in any tube keyer, the key is quite safe from any danger of electrical shock.

With a tube keyer of this type, the keying characteristic with different crystals remains practically the same with varying tuning and loading conditions, assuming crystals of reasonable activity.

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* This vacuum-tube keyer is only a slight variation of the usual type, but the article is of particular interest because it points up the importance of "by-pass" condenser values in determining the keying characteristic.

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Fig. 1 — Circuit diagram of the crystal oscillator and vacuum-tube keyer used at KL7AQQ.

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\begin{align*}
R_1 & = 10 \, \mu\text{fd}.
R_2 & = 47 \, \mu\text{fd}.
C_3, C_4 & = 0.1-\mu\text{fd} \, 400\,\text{volt paper}.
C_5 & = 200-\mu\text{fd. variable}.
C_6 & = 0.01-\mu\text{fd. ceramic or mica.}
C_7 & = 100-\mu\text{fd. variable}.
R_1 & = 68,000 \, \text{ohms}.
R_2 & = 390 \, \text{ohms}.
R_3, R_4 & = 10,000 \, \text{ohms}.
R_4, R_5 & = 1 \, \text{megohm}.
L_1 & = 80-\text{meter coil}.
RFC_1, RFC_2 & = 2.5-\text{mh. choke}.
\end{align*}
\]
Multiband Tuning for the 6146 Amplifier

A Compact Shielded Unit Covering Six Bands

BY DONALD H. MIX,* WITS

Quite often in the construction of a piece of equipment the design centers around some particular desired objective, with other considerations compromised, if necessary, to achieve this objective. In the case of the r.f. amplifier shown in the photographs, one of the primary considerations was physical size. This was considered important not only for the sake of conserving space, but also because ready-made shielding enclosures are most easily obtained in the smaller sizes. In this case, the assembly is a one-piece unit that fits into a standard 5 × 6 × 9-inch aluminum box.

The unit was built primarily to follow the remotely-tuned VFO described in the January number of QST 1 and the Bandbox frequency multiplier illustrated in the April, 1952, issue. 2 Both are shown in the current edition of The Radio Amateur's Handbook. Since these units are designed so that their shielding enclosures can be permanently “buttoned up,” it is naturally desirable that the amplifier should be built along similar lines. This, of course, rules out plug-in coils. Turrets and other coil-switching systems are bulky, and there is no way of easily providing for adjustment of the output coupling. The “roller-type” coil in a pi-section tank circuit can be made so that it takes up little space but, thus far, no inexpensive turns counter is available, making it difficult to change bands rapidly. Not entirely without misgivings, we turned to the National MB-40SL multiband tuner.

The Multiband Tuner

This tuner has a rating of only 40 watts input to the amplifier, whereas the 6146 can be operated up to 90 watts input. There was doubt both as to the voltage breakdown of the condenser and the current-handling capability of the coils. As supplied, the unit is designed for series plate-voltage feed. This means that for a d.c. plate voltage of 600 and 100 per cent modula-

* Assistant Technical Editor, QST.
1 Mix, “Simple Remote Tuning for the VFO,” QST, Jan., 1952, p. 27.
3 The substitute coil could consist of two windings of 9 turns each, No. 14 d.c.e. close-wound or No. 18 enam. space-wound to a length of 3⁄8 inch, the two windings spaced 3⁄4 inch on a Millen type 48000 1-inch diam. coil form.

Looking in at the top of the 6146 amplifier. The unit may be mounted in any position, depending upon the desired placement of controls on the transmitter panel. Whatever side is chosen for the top should be perforated with 3⁄4-inch holes in the area above the tubes.

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The plate r.f. choke is threaded onto one of the assembly screws and the plate by-pass, $C_b$, is fastened by its lower terminal with a screw tapped into the rear of the tank-condenser frame. The plate blocking condenser, $C_s$, is mounted by soldering one of its terminals to the rear stator terminal of the tank condenser. The small coil is the parasitic suppressor, $L_s$. The coax output connector is ready to be mounted at the rear of the box.

The same system may be used with a screen-grid amplifier, provided the screen is fed from a fixed-voltage source. However, this is not too desirable, because a relatively small increase in bias, an increase in driving voltage, or a reduction in plate loading will cause a large increase in screen dissipation, since there is nothing to limit the screen input. It is always preferable to operate the screen through a series resistance from a source of voltage higher than the normal screen operating voltage. Then, any increase in screen current above normal is accompanied by a corresponding decrease in screen voltage and the screen input is held within reasonable limits.

On the other hand, the use of a screen resistor makes the use of fixed bias unsatisfactory as a protective measure. While the bias required to cut off all input to a triode is approximately the plate voltage divided by the amplification factor of the plate, in a screen-grid tube it is dependent on the screen voltage and the amplification factor of the screen. For the 6146, this factor is about 4.5. Thus, it would seem that if the normal screen voltage is 165, for instance, a biasing voltage of 165/4.5, or approximately 37 volts, should bring the input to zero. But when we apply this 37 volts, we find that the input is not cut off. The reason for this is that the application of bias has caused the screen current to decrease as anticipated but, with less current through the screen resistor, the screen voltage has increased. A further increase in bias results in still higher screen voltage. The vicious circle continues until the screen voltage reaches the source voltage and can rise no higher. Under this condition, even if the maximum screen-to-cathode voltage rating of the tube has not been exceeded, it will usually be found that the bias is now higher than the normal operating bias for the tube.

**Clamp-Tube Protector**

A method of protection that has become popular more recently is the use of the so-called clamp tube. In Fig. 1, $R_1$ and $R_2$ are the amplifier screen resistor and grid leak, respectively. When proper excitation is applied to the amplifier, the biasing voltage developed across $R_1$, applied equally to both tubes, is sufficient to cut off the plate current of the clamp tube. Therefore, the clamp tube has no effect on the operation of the amplifier circuit.

The amplifier and clamp tubes are mounted on brackets swung from the side of the frame of the multi-band tuner. Both link and tuning-control shafts are fitted with panel bearings and flexible coupling.

QST for
However, when excitation is removed from the amplifier, the bias on the clamp tube falls to zero and the clamp tube draws a large plate current through $R_4$, dropping the amplifier screen voltage to a value that keeps the amplifier tube from drawing a damaging amount of power.

The limiting factor in this system is that as the clamp tube draws current through the screen resistor, $R_4$, the voltage at its plate is reduced so that the plate current drawn by the clamp tube tends to taper off. The clamp-tube circuit shown in Fig. 1, suggested by W2FBA, constitutes an improvement over the usual arrangement in which the clamp-tube screen is connected directly to its plate. The screen of the clamp tube is maintained at a relatively high value by operating it from the comparatively fixed source of a voltage divider consisting of $R_2$ and $R_3$. Therefore, the clamp-tube screen voltage does not fall off along with the plate voltage and, as a result, the clamp tube draws more current at low plate voltage. With the 6146 amplifier and 6AQ5 clamp tube, and the amplifier screen operated from a 375-volt supply through $R_1$, the screen voltage can be brought down to 10 or 12 volts, the amplifier plate current falling to about 30 ma with a 600-volt plate supply. This is within the dissipation rating of the 6146.

### Background Noise

However, many of those who operate break-in have found that even a slight amount of idling input to the amplifier gives rise to objectionable noise in the receiver. To bring the input to zero to kill this noise, it becomes obvious that some fixed bias must be used. Since the screen voltage is held to a low value by the clamp tube, a fixed bias in the vicinity of 15 volts is sufficient to cut the input to zero. However, a 22½-volt battery is a more convenient source and the extra voltage does no harm. The normal grid-leak resistance is merely reduced to compensate. If the noise is not a factor, the battery may be omitted and the grid leak increased to normal voltage — 28,000 ohms.

### Construction

Most of the constructional details can be seen from the photographs. All assembly and wiring can be done before the unit is placed in the box. The two brackets holding the tubes are each 2½ inches square, not including a half-inch mounting lip at the rear. The slide strip of the condenser frame (on the side toward which the link swings outward) is drilled and tapped for the screws that fasten the brackets. The two separate brackets might well be replaced by a single one running the length of the condenser frame. In this case, the lip should be bent downward to provide sufficient space underneath for the components under the 6AQ5. There is only one essential precaution — mount the 6146 sufficiently far away from the tuning unit so that the tube does not interfere with the swinging link.

(Continued on page 128)
Six Vertical Elements on 21 Mc.

A Rotatable Beam with Wire Elements

BY JACK D. RIGGS, W7HAD

Here is an antenna system that offers several advantages over other types, if you have a location where you can install it. The original idea was borrowed from Tom Erdmann, W7DND, who has been using a 9-element 28-Mc. affair of similar construction for two years with excellent results.

The antenna has most of the advantages of a horizontal array, plus a few features of its own. It can be tuned up at ground level and left that way. This is an important factor when one is looking for optimum performance and/or has an aversion to climbing towers.

As can be seen from the sketch in Fig. 2, the array is basically two close-spaced 3-element beams spaced 0.3 wavelength. The gain and directivity would be slightly higher with 0.5-wavelength spacing, but this involves mechanical complications in building the larger structure. The system is fed with either 50- or 75-ohm coaxial line, using a coil-and-condenser combination at the antenna for matching purposes. Wire elements are used for economy, and the wooden framework is made of 2-by-2s and 1-by-2s, as shown. The whole array is suspended from a 18-foot-long 2-by-2 boom that is attached to a tower.

Tuning the Beam

The tuning is rather simple, and it was done at W7HAD with the help of a grid-dip meter,

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In these days of horizontal 3- and 4-element beams, we are likely to forget that antennas using vertical elements can often be built easily and inexpensively. In this article, W7HAD describes a 6-element beam for 21 Mc. that should give you some ideas for that band or for 28 Mc.

"Antennascope," and the remote field-strength meter shown in Fig. 1. With nothing connected to the coil and condenser (L1C1 of Fig. 2B), the circuit was tuned to 21.2 Mc. using the grid-dip meter. The antenna wire that connects to the coil and condenser was then attached, and its length was trimmed until, on or off, it didn't change the resonant frequency of the coil-and-condenser combination.

Next, the open-wire phasing system was attached and its length trimmed until it, too, had no effect on the tuning of L1C1. Finally, the other antenna wire was attached, at the far end of the phasing section, and its length trimmed until it had no detuning effect. The phasing section and the two driven elements are now of the proper length.

The field-strength meter is used in checking the reflector and director lengths. It should be set up as far from the antenna as possible—at least 100 feet—and at the same height or a little higher. Using the Antennascope, a "gamma" tap that indicated 70 ohms was found across a

Left: A view from the mast of the bottom spreader, showing the phasing section support and the housing for the coil and condenser. Right: The coupling coil and condenser are shown here with the protective plastic housing removed. Clips on the end of the coaxial cable facilitate matching the line.
few turns at the center of $L_1$, and the coaxial line from the transmitter was connected at these points. Keeping the power input to the transmitter constant, the director lengths were adjusted to give maximum field-strength meter readings. The beam was then rotated 180 degrees and the reflector lengths were adjusted for minimum back radiation.

The beam is finished by making a small plastic housing to weatherproof the coil and condenser. Checks on the beam were made, and it was found to have one major lobe, with little back and side radiation. The major lobe was approximately 50 degrees wide at half-scale readings. On receiving, the antenna has performed well, and the signal-to-noise ratio is good, despite the reputation for "noisiness" that generally is given to verticals.

A vertical antenna like this cannot be expected to fire into a hill and get through or over it, but it should be fine in flat country or on the top of a slight rise.

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**Fig. 1** — Simple field-strength meter for tuning the beam.

- $C_1$ — 50-μfd. variable.
- $C_2$ — 0.002-μfd. mica or ceramic.
- $L_1$ — 4 turns No. 20 on 1 1/2-inch diam., 1 inch long.
- $M$ — 0–200 microammeter.

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**Fig. 2** — The mechanical (A) and electrical (B) details of the 6-element 21-Mc. beam. The half-wavelength open-wire phasing section is jogged in the center to accommodate its length of 22 feet in the 16-foot separation of the driven elements. For simplicity, guy lines to ground are not shown.

- $C_1$ — 40-μfd. variable.
- $L_1$ — 10 turns No. 4 wire, silver-plated, 1 1/2-inch diam., 7 inches long.
Modifying the Heathkit AR-1 Receiver for Amateur Use

A Low-Cost Receiver for the Newcomer

By Lewis G. McCoy, WI1CP

In all but a few isolated instances, one of the problems facing the newcomer to amateur radio is the cost of the equipment for his first station. Naturally, the cost will depend to a large extent upon how elaborate a layout is planned, and that is why most newcomers start with a modest station and add to it through the years. Perhaps the most important piece of equipment for the beginner is the receiver since it will be used first for copying code-practice stations and, later on, in making contacts with other amateur stations. Receivers can be expensive items, but two ways to hold the cost down are to convert a war-surplus receiver or to build your own from scratch. There is still a third way, however, one that we believe has them all beaten when it comes to saving money, and the purpose of this article is to tell you about it.

Among the available "all-wave" receiver kits on the market, the Heathkit AR-1 struck us as having the greatest potentialities for conversion into a "communications" receiver. The complete kit sells for less than $25, and if you build it as described you have a 5-tube superheterodyne that covers from 550 kc. to 20 Mc. It has an a.c. power supply (usually to be preferred to so-called "a.c.-d.c." operation) and "phono" input. The phono input would probably be of little use to a ham but, along with the broadcast-band coverage, it makes a good selling point if getting the little woman on your side is a factor.

The modifications necessary to make the AR-1 a communications receiver are simple and easy to make. They consist of adding a 12JS b.f.o. ("beat-frequency oscillator," for the reception of code signals), a bandspread tuning condenser and vernier drive, an r.f. gain control and a.v.c. ("automatic volume control") switch, and a headphones jack. The a.v.c. must be disabled when receiving c.w. signals — the switch cuts the a.v.c. out and the gain control in, or vice versa. Only a few simple tools are needed to assemble the receiver. Some tools can be used on future radio projects. Among the tools that are a "must" on the shack workbench are a 75- to 100-watt soldering iron with a 3/8-inch tip, some rosin core solder, a pair of long needle-nose pliers, a pair of diagonal side cutters and two screwdrivers (one with a 3/8-inch blade for small setscrews and the other with a 1/4-inch blade for larger bolts). A set of metal-cutting drills in standard sizes such as 3/8, 1/4, and 1/2 inch will also come in handy.

The Mechanical Work

The first step in the modification is to pick up the additional components at your local radio store — a list is given in the table. To mount these extra components, a few holes must be drilled in the chassis and panel. Two holes are required on the chassis front, with corresponding holes in the panel, for the r.f. gain control and the b.f.o. on-off switch. These holes are drilled 3 3/8 inches in from each end of the chassis, on the same horizontal line as the existing holes.

Holes for the b.f.o. transformer and the new tube socket are placed at the left front corner of
The b.f.o. transformer and 12J5 oscillator are mounted on the front left-hand side of the chassis. The black knob on top of the b.f.o. transformer is the pitch control.

The chassis, as can be seen in the photographs. Three holes are required for the b.f.o. transformer, two for mounting and a third between them for the wires. The headphones jack hole is drilled in the rear wall of the chassis, near the output transformer. A small right-angle bracket, bent of aluminum or other scrap metal, is required for mounting the bandspread condenser, and it is fastened to the chassis by two screws. The exact size and placement of the bracket will depend upon the size of the tuning knob or drive mechanism that is used.

Wiring

After the holes are cut in the chassis, the receiver can be wired as per Heathkit instructions, with the following exceptions: In Step 7 of the Heathkit instructions, Pin 7 is not soldered — this pin will be the connecting point for the heater lead from Pin 7 of the 12J5 b.f.o. heater. In Step 14 of the instructions do not mount the 100-ohm resistor (SW11) — this resistor will be mounted at a different point when installing the r.f. control. Also, do not solder Pins 5 and 6 of the 12SH7 i.f. tube, since these points will be used for r.f. gain control connections. Pin 6 of the 12SH7 mixer tube is not soldered, as the lead for the b.f.o. plate voltage is run to this point. Pin 5 of the 12C8 is left unsoldered, to take care of the lead from the b.f.o. output coupling condenser. The ungrounded side of the output transformer is left unsoldered, to take care of the lead from the headphones jack.

B.F.O. Installation

After the receiver is wired, we are ready to make the modifications. The b.f.o. transformer is mounted first and wired according to Fig. 1.
An insulated tie point is mounted under the bolt that holds the soldering lug at the ground point of leads "E," "F," "G," and "H." A lead is run from Pin 6, the screen of the 12SH7 mixer tube, to one side of $S_1$. $R_2$ is mounted between the switch and the insulated tie point, and a lead runs from the tie point to Pin 6 of the 12J5. Pin 6 of the 12J5 socket is used as a tie point for $C_3$, the $B+$ lead to the b.f.o. transformer, and the lead from the insulated tie point. Pin 4 of the 12J5 socket is used as a tie point for the grid lead from the b.f.o. unit to $C_1$ and $R_1$.

**R.F. Gain Control and A.V.C. Switch**

Most communications receivers have a separate switch for the a.v.c., but to save panel space in this modification, the a.v.c. switch and the r.f. gain control are combined in one unit. A single-pole double-throw switch is mounted on the back of the r.f. gain control. The receiver gain increases as the control is turned clockwise. In the extreme counterclockwise position of the gain control, the switch actuates and turns on the a.v.c. (At the same time it also switches the cathode bias of the i.f. tube back to a minimum, so that the gain is limited only by the a.v.c. voltage.)

Fig. 2 shows the modified 12SH7 i.f. amplifier circuit, the added components being shown by the heavier lines. $R_2$ is installed with its terminals toward the bottom of the receiver. $R_1$ is mounted between Pin 6 of the 12SH7 and the terminal of $R_2$ closest to the audio volume control. Heathkit 100-ohm resistor, SW17, is mounted between the arm (center terminal) of $R_2$ and Pin 5 of the 12SH7. The third terminal of $R_2$ is grounded. A lead from the arm of $R_2$ is connected to the nearest terminal of $S_1$. The center terminal of $S_1$ is grounded. The third terminal is connected to the input i.f. transformer (BR16) at the junction of the 1-megohm Heathkit resistors, 017.

**Bandspread Condenser Mounting**

Fig. 3 shows the modified circuit with $C_{1A}$ and $C_{1B}$ installed. In removing the single stator plate from each stator section, care should be taken not to bend the other plates. The best method is to set the condenser at minimum capacity (open) and, with a pair of long-nose pliers, carefully remove the inside plate of each stator. It only takes a slight bend of the plates to loosen them. The condenser rotor is grounded through the supporting bracket. A lead is run toward the bottom of the receiver.
from each stator of the bandspread condenser to the nearest stator of the general coverage condenser (AR10-A) and (AR10-B). An insulated shaft coupler is used between the condenser and the shaft from the tuning knob or vernier drive mechanism.

![Circuit diagram](image)

*Fig. 4 — Circuit diagram of headphones jack addition. J1 — Open-circuit jack.*

Fig. 4 shows the circuit for the addition of the headphones jack. Because one side of the output is grounded, only one lead need be run from the output transformer to the ungrounded side of the open-circuit jack.

**Operation**

The receiver alignment is carried out as described in the Heathkit instruction book, and the b.f.o. unit is tuned according to the directions that come with it. For c.w. operation the receiver is set up as follows: the b.f.o. switch is turned on, the audio gain turned up, and the a.v.c. turned off. The r.f. gain control is set to a suitable signal level, and the b.f.o. pitch control is set to where the background hiss is low-pitched. Signals can then be tuned in by setting the main tuning dial to some amateur band and exploring the band with the bandspread condenser. With the modified bandspread condenser in the circuit there is approximately 200 kc. of bandspread on the 80-meter band for 180 degrees rotation of the bandspread condenser. This is ample spread for tuning convenience. The correct setting of the main tuning condenser to cover a given portion of an amateur band with the bandspread condenser will be determined by experiment. It will take three settings of the main tuning dial to cover the entire 80-meter band with the bandspread tuning dial. On 40 meters, only one setting of the main tuning dial is necessary as the bandspread condenser will cover approximately 400 kc. through 180 degrees of rotation. For 'phone operation, the a.v.c. is turned on and the b.f.o. turned off. The audio volume control is varied for best audio level.

The total cost of the receiver with modifications is approximately $30.00, and its performance is comparable to that of receivers costing a great deal more.

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**Parts List for the AR-1 Modification**

- 5-odd, mica condenser
- 100-odd, mica condenser
- 470-odd, mica condenser
- 15-odd, dual variable condenser (Bud LC1660 Dual Tiny Mite)
- 22,000-ohm resistor, 1 watt
- 47,000-ohm resistor, 1 1/2 watt
- 47,000-ohm resistor, 1 watt
- 100-ohm potentiometer with s.p.s.t. switch
  - Clarostat type AM-8-5 with Clarostat switch type SW-a 60-36; IRC type potentiometer No. Q11-103 with type 76-1 switch, or CentraLab type B-5 potentiometer with type KB-1 switch
  - S.p.s.t. toggle switch, 1-inch shank
- B.f.o. unit (Meissner 17-6753)
- Shaft coupler (E. F. Johnson No. 104-250 or National No. TX-10)
- Open-circuit jack (Mallory type 701)
- Vernier drive, optional (National type AM dial)
  - 1/4-inch diam. brass rod (ICA 2117)
  - One single-terminal insulated tie point
  - Three feet of insulated hookup wire
- Octal socket (Amphenol 88-8)
- Type 12J5 tube

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May 1953
Multi-Impedance Dipoles
Closer Matching at Various Antenna Heights

BY JOHN D. AVERY,* W1IYI

* R.F.D. 1, Rockville, Conn.

While looking at a chart in the ARRL Handbook that shows the impedance of a half-wave antenna at various heights above ground, I began to wonder if a wire at my QTH would behave "like the book says." My location is at a lake shore, where water and wet ground are always present, so any measurements could be made over a period of time without running the possibility of a significant change in the electrical ground. ("Electrical" ground and the "surface" ground do not coincide—the electrical ground is usually some feet below the surface, depending upon the characteristics of the soil and the radio frequency being used.)

The measurements were made with a single wire a half wavelength long, split in the center so that a 52- or 72-ohm coaxial line could be connected. Two 60-foot towers were used to support the antenna, and a standing-wave bridge was available for use in the coaxial line. The procedure that was followed was quite elementary—with a given coaxial line connected to the antenna, the antenna was raised a few feet at a time until the minimum s.w.r. was indicated.

Starting with 52-ohm coax and the antenna one foot off the ground, the s.w.r. was rather high, but as the antenna was raised the s.w.r. dropped and was quite close to unity at around 35 or 40 feet. Substituting 72-ohm coax for the lower-impedance line, the s.w.r. was higher. As the antenna was raised (now fed with 72-ohm line) the s.w.r. was dropping as the maximum height of 60 feet was reached.

Having run out of height at my place, I managed to prevail upon a ham in Rhode Island who had higher supports to test with a 102-ohm line (52-ohm lines in series), and he found the minimum s.w.r. to fall at around 90 feet.

The diagram in Fig. 1 shows part of the Handbook graph that started this whole thing, with the three experimentally-determined points shown as small circles. Since they don't fall too far off the curve, they seem to prove that "the book is right."

This got me thinking about what might be happening to folded dipoles at various heights above ground. Since a two-wire folded dipole shows a four-times step-up in impedance (and a three-wire dipole a nine-times step-up) I added these values to the chart, on the left-hand side. A little study of this chart shows that, for low antenna heights (low in wavelengths) such as one runs into on 75 meters, the first choice of antenna and feed line might not always be the best. For example, a two-wire dipole only 25 feet off the ground should match better with 72-ohm coaxial line than with 300-ohm ribbon. A 3-wire dipole 35 feet above the ground offers a better match for 300-ohm line than does the more conventional 2-wire folded dipole. These statements are based on "electrical" ground, of course, a

Fig. 1 — The solid line is a theoretical curve showing the variation in impedance for a single-wire half-wave antenna at various heights above ground. The values for 2- and 3-wire folded dipoles can be expected to vary in the same way. The small circles are experimentally-determined values for a single-wire antenna.
somewhat variable plane in most cases. Nine times out of ten it can only be found by experiment.

**The Multi-Impedance Dipole**

In an attempt to make better use of this (to me) new-found knowledge, a simple spreader system was devised that would permit changing quickly between two- and three-wire folded dipoles and a single-wire dipole. As shown in Fig. 2, the basic three wires can be used in these three ways. The spreaders were made from soft pine turned down to size and then boiled in hot paraffin. Fig. 3 shows some of the construction details. A center connecting block of ¼-inch lucite was built to take terminals and a coaxial connector, for quick changing of the various feed lines. It is apparent from Fig. 2 that changing from one antenna to another only requires changing a few jumpers, and perhaps disconnecting one feed line and connecting another.

With a system like this, it is not too difficult a task to find the best combination of line and antenna for the particular height you have available. You will probably want to use the maximum available height for the antenna, so it isn’t suggested that you run the antenna up and down for a perfect match, although you may find the experiment interesting, as I did. For any length of antenna there is one frequency at which the s.w.r. is a minimum, and the s.w.r. will increase slowly as the frequency is changed in either direction. However, I noticed that the 2- and 3-wire folded dipoles, and the 3-wire dipole of Fig. 2A, seemed to be “broad” in this respect and not at all critical.

Although it has been pointed out many times before, it is worth repeating here that you need suitable coupling at the transmitter for each type of line. If you use an antenna coupler, small 2- or 3-turn links are adequate for coupling between coupler and transmitter, but larger links may be required if no coupler is used. I use plug-in links and a variable condenser in series with one side of the line. The largest plug-in link is 12 turns.

Right now I am using the antenna of Fig. 2A, fed with 52-ohm coaxial line. Local and DX results on 75 have been very encouraging.

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**Fig. 2** — With three wires strung up in the air, one has the choice of connecting them as (A) plain dipole, (B) 2-wire folded dipole, and (C) 3-wire folded dipole.

**Fig. 3** — Constructional details of the multi-impedance antenna. Pine spreaders are used, boiled in paraffin to make them water-resistant. The antenna wires (and jumpers) are connected to ¼-inch brass screws in the end spacers and in the lucite terminal block. The terminal block carries a coax fitting — an open-wire line can be connected directly to the brass screws.

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May 1953
The informal s.s.b. dinner in New York on March 23rd was a whopping success anyway you look at it. If numbers measure the thing, then 110 at dinner should prove the point. If geographical distribution means anything, just note that all W districts were represented, along with a VE3, a CM9 and an LU3. If growth is an indication, compare the attendance with 33 the previous year and 17 two years ago. In all honesty, however, it should be pointed out that the attendance was not restricted exclusively to s.s.b. operators, and there were a half dozen or more self-confessed "s.m. spies" in the group. Credit for the party goes to W2NJR and W2MTJ, and everyone hopes the dinners will continue to be an annual affair, although the exponential growth curve may prove a problem.

FCC Commissioner George Sterling, W3DF, is active at the high end of 75 with an Edmunds exciter, and the gang is more than pleased to welcome him to the ranks. . . . The 7-Mc. s.s.b. activity isn't developing as fast as some thought it would, but W2JJC and W6KNH were among the first to get on, working each other in good style through the umpteen layers of QRM and general noise.

Roy Ehlman, ZS2GA, in Port Elizabeth, is sharing South African honors with ZS6KD. Roy uses a phasing job a la W9DYV, which at present ends in an 807 but will soon drive an AX-9903 final. Activity is on 80, 40, and 20 (ZS "phone is 3.5 to 3.8 and 7.0 to 7.15 Mc."). ZS6KD uses a filter-type exciter.

A recent note from G3FHL tells how he has now worked 12 countries on two-way 80-meter s.s.b. Geoff reports G3AUB (Edmunds exciter, 30 watts) and G2NH (crystal filter) as two of the newest Q stations on s.s.b.

**Automatic Antenna Switching**

Although relays can be used for quick switching of antenna from receiver to transmitter when working voice-controlled break-in, it is much nicer to do it electronically. Two circuits used for this purpose by Bill Rust, W2UNJ, are shown in Fig. 1. The circuit at A is along the lines of that described by W2OUA (Cronin, *QST*, June, 1952).

![Fig. 1 — Two TR ("transmit-receive") switch circuits that have been used by W2UNJ. The circuit at A uses two large inductances, L5 and L6, a small condenser, C1, and a neon bulb. The circuit at B uses only one coil and adds a small flashlight bulb for added protection of the receiver.](image-url)

C1 — 50-mfd. variable.
L2 — 90 turns No. 28 enam. on 3.4-inch diam. form (for 3.9 Mc.).
I1 — 6-8 volts, 150 ma.

The neon bulb can be 1/4 watt with a low-powered rig and 2 or 3 watts with a high-powered transmitter.

Although DL6WL is called "haywire" by operator Herbert Stratemeyer himself, there was nothing haywire about the 75-meter s.s.b. signal from this station during the spring months. An Edmunds exciter was first used back in 1951, but the present rig is a phasing affair, with handswitching to 80, 20 and 15 meters in the p.p. 250-watt final. (Photo courtesy W2JJC)

**Adjusting Phasing-Type Exciters**

In one of the QST exciters (November, 1949) it was mentioned that a 'scope can be used for checking the 90-degree r.f. phase shift, by ad-
A Hand-Carried Portable Rig for 220 Mc.

Civil Defense Communication in a 3-Pound Package

BY J. ROY WOLFSKILL,* W2RPU/1

Realization of the full value of amateur radio in civil defense communication frequently is dependent on the availability of lightweight portable gear that can be operated from its own self-contained batteries. Many portable rigs designed for this purpose have been described, but few of them make use of 220 Mc., one of the amateur assignments designated for possible wartime emergency use under the RACES plan. The 220-Mc. band may have certain advantages for c.d. work. It can supplement other bands in areas where lower frequencies are already well occupied by c.d. nets, and it is capable of good coverage in short-range communication. The fact that a full quarter-wave antenna is only a foot long at 220 Mc. is a factor that should not be overlooked.

This complete self-contained 220-Mc. transmitter-receiver is only 3 by 3½ by 9 inches in size, except for protuberances for earphone, microphone, controls and antenna socket. Weight, including batteries and antenna, is under three pounds. Power output at 220 Mc. is approximately 250 milliwatts. Filament-type tubes are used throughout, and considerable thought was given to conservation of battery power, in view of the small size of the batteries used. With some modifications a similar design could be used on 144 Mc.

The transmitter section uses a 1V5 crystal oscillator-tripler, a 1V5 doubler and a pair of 885s in a push-pull final amplifier. The crystal frequency is between 36.67 and 37.5 Mc. In the superhet receiver, two 856s serve as oscillator and mixer, followed by a 1V5 superregenerative second detector. In the audio portion, common to both transmitter and receiver, a 1V5 drives a 3Q4. A quarter-wave rod antenna is used normally, though it is removable and a better antenna system can be substituted when available.

The hand-carried portable for 220 Mc. described by W2RPU. Total weight, including antenna and batteries, is less than three pounds.

Filament power is supplied by two standard flashlight cells. The rig will operate on a single cell, but two in parallel give much longer life. The drain is about 380 ma. in the receive position and 450 when transmitting. Two small 45-volt "B" batteries furnish 30 ma. plate drain while transmitting and 20 for receiving.

Circuit Details and Adjustments

In the transmitter, the oscillator circuits are slug-tuned, with no variable capacitance added. The position of the tap on L1 determines the proper functioning of the oscillator. Normally, it will be about one-third of the coil up from the crystal end, though its position may be changed to take care of different crystal characteristics. Easy crystal starting, without a tendency to take off on any spurious frequency, should be the objective here. The grid coil is resonated at approximately the crystal frequency, and the plate coil, L2, at three times this frequency. Initial adjustment is made easier if a grid-dip meter is available. Final setting should be made for maximum indication on a 0–1 ma. meter connected at test point A. This should be 0.5 to 1 ma.

The second 1V5 is tuned to the operating frequency by C9 and L3, connecting the 1-ma. meter at test point B for indication of resonance. About 1 ma. grid current should be obtained. As this reads the excitation to the final stage it may also be used for the neutralization adjustment, which is next in order. Neutralizing capacitors, C1, are short lengths of insulated wire soldered to the grid terminals of the 958 sockets, the other ends being wrapped around the plate leads to the opposite tubes. The turns of these wrap-grounds are trimmed to the point where there is no fluctuation in grid voltage when the plate circuit is tuned through resonance with the excitation on but no

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* 310 Logmont St., Danvers, Mass.
Fig. 1 — Circuit diagram and parts list for the 220-Mc. transmitter-receiver.

C₁ = 0.001-μfd. ceramic.
C₂, C₅, C₆, C₁₀, C₁₆ = 40-μfd. ceramic.
C₃ = 500-μfd. ceramic, feed-through type.
C₄, C₉ = 500-μfd. ceramic, stand-off type.
C₁₁, C₁₂ = 5-μfd. variable.
C₁₃, C₁₄ = 0.6-μfd. midget variable (Johnson 9M11).
C₁₅ = 500-μfd. ceramic.
C₁₆ = 0.0047-μfd. mica.
C₁₇, C₁₈, C₂₀ = 0.01-μfd. midget tubular.
C₁₉ = 8μfd., 100 w.v.d.c.
C₂₁ = 20 μfd., 25 w.v.d.c.
C₂₂ = 0.002-μfd. midget tubular.
C₂₃ = Approx. 2 turns No. 18 insulated wire around plate leads. See text.
R₁ = 4700 ohms.
R₂, R₆ = 10,000 ohms.
R₇ = 0.1 megohm.
R₈, R₁₀ = 100 ohms.
R₉, R₁₀ = 2.2 megohms.
R₁₁ = 50,000 ohms, variable.
R₁₂, R₁₃ = 0.47 megohm.
R₁₄ = 0.15 megohm.
R₁₅ = 470 ohms.

All fixed resistors 1/2 watt.
L₁ = 13 turns No. 20 enam., 1/4-inch diam., slug-tuned.
L₂ = 6 turns No. 20 enam., 1/4-inch diam., slug-tuned.
L₃, L₄ = 5 turns No. 18 enam., 3/4-inch diam., 3/4 inch long, center-tapped.
L₅ = 1 turn No. 18 enam., 3/4-inch diam.
L₆, L₇ = 6 turns No. 18 enam., 3/4-inch diam., L₆ tapped 1/2 turn from ground, L₇ about 2 turns from plate end.
L₈, L₉ = 22 turns No. 26 s.c.c., close-wound on 3/4-inch slug-tuned form.
BT₁ = 1 1/2-volt Eveready type D (two in parallel).
BT₂ = 45-volt Eveready type 455. Minimax (two in series).
MIC = Single-button microphone.
Earphone — 2000 ohms, from headset.
RFC₁ — 7-p. v.h.f. choke.
S₁₁ A, S₁₂, S₁₃ = D.p.s.t. microswitches, or 3-section unit designed for the purpose.
S₂₁ A, S₂₂ = S.p.d.t. slide switch.
T₁ = Microphone transformer, 200 ohms to 50,000 ohms.
T₂ = Output transformer, 10,000 ohms, center-tapped, to 2000 ohms.
plate voltage applied. Resonance in the final plate circuit and optimum coupling to the antenna can be determined with a field-strength meter.

In the receiver portion the oscillator is tuned over a range of 190 to 195 Mc. It is inductively coupled to the mixer grid circuit, $L_6 C_{14}$, which is tuned from 220 to 225 Mc. The two coils, $L_6$ and $L_7$, are identical in construction, the spacing of their turns being adjusted for tracking across the band. The mixer circuit is not particularly selective, so tuning and tracking adjustments are not critical. The mixer plate circuit is resonated at 30 Mc. by adjustment of the slug in $L_8$, and the detector grid circuit similarly by means of $L_9$. These two slug-tuned coils are mounted end to end, about 1/4 inch apart. The two tuning condensers, $C_{14}$ and $C_{15}$, are ganged by mounting them back to back and soldering a short bushing between the rear ends of their rotor shafts. The oscillator and mixer grid coils are side by side, about 1/2 inch apart.

The 1V5 superregenerative detector provides considerable gain at the intermediate frequency, yet it operates smoothly as its load is a fairly constant impedance. It may be set up for optimum operating conditions and it will require very little adjustment thereafter. Such a receiver line-up provides a moderate amount of selectivity and considerable sensitivity with few tubes. It is superior to a superregenerative detector on the operating frequency, and it causes no interference.

The audio circuit does away with the need for the transceiver type of transformer often used. A transformer with a tapped primary serves as a combination of modulation and audio output transformer. This balanced modulation arrangement, with the current for the 3Q4 running through one half of the tapped winding and the modulated voltage to the 9558 through the other, provides better efficiency than the modulation choke method often used with single-ended modulator stages. An audio monitor may be had by shunting the contacts on $S_10$ with a 5000-ohm resistor, though some power is lost in this way.

Looking at the power circuits, it will be seen that with the two-circuit slide switch, $S_3$, in the off position no current can be drawn from either battery. The send-receive switch, $S_1$, has three circuits for antenna, filaments and output winding switching. In the normal or “receive” position, only the receiver and audio filaments are lighted. On “transmit,” the receiver filaments go off and the transmitter filaments and microphone voltage come on, keeping the over-all drain from both “A” and “B” batteries to a minimum. The send-receive functions are performed by a home-made arrangement using three microswitches actuated by a push button made of phenolic rod. Several multielectric switches of suitable design for this application are available commercially.

**Mechanical Features**

The rig is built on the cover of the box, with the batteries held in place in the main portion of the case. Construction was done by the sub-assembly method, with the whole r.f. and audio enclosed inside a U-shaped chassis that occupies approximately three-fourths of the panel area. Individual subassemblies mounted on U-shaped brackets inside this chassis are as follows, looking down from the top of the interior photograph: final amplifier and multiplier stages; crystal oscillator; and mixer, oscillator and second detector. The audio components are mounted in the end portion of the main chassis. The antenna socket is in the top of the case, the bottom of the socket making contact to a spring clip on the send-receive switch when the case is assembled.

A size-limiting factor in the use of acorn tubes is the relatively large sockets they require. This was taken care of through the use of special sockets made from polystyrene tubing of 11/16-inch inside diameter and 1/16-inch wall thickness. Ordinary polystyrene coil forms about 3/4-inch diameter may also be used. Clips removed from standard acorn sockets were mounted on the outside of these forms and bent over the top and edge. Exact locations of the clips can be determined by inserting the tube pins in the clips and then bending and mounting them in such positions that tubes can be inserted and removed.

Interior view of the 220-Mc. transmitter-receiver. The individual subassemblies are mounted inside a U-shaped chassis attached to the cover of the case. Transmitter components are at the top, receiver circuits at the center, and audio equipment at the bottom. Antenna and batteries are in the bottom case portion.

May 1953
Happenings of the Month

LICENSE RENEWALS

Considering the present volume of ARRL License Manual sales, it would seem that every amateur must certainly have a copy of his own, but that obviously is not so from the number of inquiries Hq. has been receiving concerning renewal requirements and procedures. Let’s go over the story again.

If your application will be for straight renewal only — that is, no modification involved such as a change of address — you should use the new short form 405-A, obtainable from your district FCC office on request. This is a multiple card form which you fill out in detail and send to Washington; actually, portions of the form are kept as FCC’s file records on your renewal, while one section is mailed back to you to become a renewal “endorsement” of your present ticket. Such application may be made any time within the last four months of the license term. In practice, 45 or 60 days before expiration is adequate since the production line on 405-As at FCC side-tracks applications submitted much earlier than that and picks them up about 30 days before expiration for processing.

So long as your application is submitted reasonably in advance of expiration, if the Commission is delayed in getting the endorsement back, you may continue operating as usual until you do hear from FCC, even after the expiration date.

To be acted on affirmatively, your application must state certain minimum requirements of activity and ability. These are that you can send and receive code at the rate of speed required for the license being renewed (5 w.p.m. for Technicians, 10 for General-Conditional-Advanced, and 20 for Extra Class), and that you have logged, at your own station or any other licensed by FCC, at least 2 hours’ operating time out of the last 3 months, or 5 hours out of the last 12 months, of the license term. On Form 405-A, your signature automatically affirms that you do so comply.

Should some modification of your license be involved at the same time you apply for renewal, then use the standard Form 610.

If you let your expiration date slip past without filing an application for renewal, you are off the air. However, you have a period of grace of one year after expiration during which you may apply for “renewal” providing you have met the activity requirements. The license is not back-dated, and in reality is a new license without examination.

CALL SIGN IDENTIFICATION

Every now and then we hear arguments on the air about correct signing procedure — whether the operator must sign the station call last. In other words, while it is obviously proper to use the form “W1AAA, this is W2BBB . . .,” is it similarly proper to say, “This is W2BBB returning to W1AAA. . . .”?

The question has been settled as an incidental part of recent FCC changes in our Section 12.82(a) which were primarily instituted to require teletype (television, too) stations to identify themselves periodically on A-1 or A-3, as appropriate, as well as by RTTY. The applicable part of the new reg, with italics added by us, is:

The operator of an amateur station shall transmit the call sign of the station or stations . . . being called or communicated with . . . followed by the authorized call sign of the station transmitting.

Oh yes — if you’ve ever wondered whether it is proper to use, in a roundtable or other net, such language as “W1AAA and the White Mountains Net, this is W2BBB . . .” instead of repeating each member call, the answer is (and has been) yes. A point of additional interest is that the new reg legalizes what has been pretty general amateur practice anyway during rapid-fire contacts in operating contests such as the Sweepstakes, where stations do not close their QSO with an actual sign-off. When your contact is terminated within three minutes, no identification at the end is required.

Here’s the new language of the entire section.

Section 12.82(a) to read as follows:

(1) The operator of an amateur station shall transmit the call sign of the station or stations (or may transmit the generally accepted identification of the network) being called or communicated with, or shall identify appropriately any other purpose of a transmission, followed by the authorized call sign of the station transmitting;

(i) at the beginning and end of each single transmission on

(ii) at the beginning and end of a series of transmissions between stations having established communications, each transmission of which is of less than three minutes duration (the identification at the end of such a series may be omitted when the duration of the entire series is less than three minutes), and;

(iii) at least once every ten minutes or as soon thereafter as possible during a series of transmissions between stations having established communications, and;

(iv) at least once every ten minutes during any single transmission of more than ten minutes duration.

(2) The required identification shall be transmitted on the frequency or frequencies being employed at the time and, in accordance with the type of emission authorized thereon, shall be by either telegraphy using the International Morse Code, or telephony. In addition to the foregoing, when a method of communication other than telephony or telegraphy using the International Morse Code, is being used or attempted, the prescribed identification shall also be transmitted by that method.

LICENSE PROCESSING

Although doing its level best to keep up with the flow of applications for new ham tickets, the amateur license branch of FCC still finds itself plagued with personnel problems, so that it has ups and downs in ability to turn out the paste-
board forms at the same rate at which applications arrive. Add to that the absenteeism caused by the winter’s “flu” bugs and it is easy to see why it’s been taking a couple of months, recently, for the processing of papers in Washington. We mention all this simply so you new applicants won’t be too disturbed if you have to wait what seems like an awfully long time to get your tickets. Also, for practical reasons the applications are processed in large batches, which explains why a friend of yours who took a different class exam the same day as you might get his ticket early and yours won’t show up for a while longer.

AUTO LICENSE PLATES

With Virginia and the Territory of Alaska the most recent additions to the list, fourteen states plus Alaska and the Canal Zone were issuing call letter license plates as of the end of 1952. If our correspondence accurately represents amateur activity, we can expect new license plate legislation from several more states with the next few months. Inquiries have been received from over a score of states during the last half-year.

At least half of the states represented in recent correspondence have already turned down previous attempts by amateur clubs or individuals at call letter plate legislation; in many cases, the same “spark-plugs” are bouncing back for another try. With the recent convening of many State Legislatures, the pace has increased considerably. The Governor of Indiana recently signed a bill which will provide for the issuing of call letter plates effective January, 1954. Things look good in Oregon, where, at last word, a bill had passed the House of Representatives, with no opposition expected from the Senate. Bills in both New York and South Dakota await only their Governors’ signatures. California and Oklahoma are among others reporting progress.

Admiring his call letter license plate is J. Carroll Melton, chairman of a committee which spear-headed the legislation in Virginia. Other committee members were W4s, AKN, JRX, JAQ and NAD.

From an AP dispatch via W2PPY we hear that 11-year-old Larry Ogureck passed his General Class exam and changed his call from WN9UBY to W9UBY. At the same time dad, WN9UBV, failed the test and must try again.

What the boys figured might be a TVL-BCL ambush was just coincidence after all. Prior to a meeting at one member’s home, the Rappahannock Valley Radio Club was instructed to go west of town for about two miles and turn right at a sign reading “Ham Shoot.”

In addition to the WTVI TV-station call sign mentioned in a recent Stray, W1DBM informs us that KTVI, Boise, Idaho; WITV, Ft. Lauderdale, Fla.; and WINK-TV, Ft. Myers, Fla., are other new ones assigned. Also, KID-TV (juvenile programs?) is in Idaho Falls, Idaho, and WSMN-TV, of course, is in Florida.

W6RJA and W7LZK point out a “perpetual motion” gimmick others may have observed. By careful adjustment an ordinary bug can be made to make dots indefinitely while interrupting a minute current flow such as furnished by an ohmmeter continuity indicator.

With another new crop of hams on hand since we last mentioned it, W9TKR and others figure it’s time again to point out that alligator clips wrapped with a few turns of solder make easily-adjustable bug weights. From the safety angle, wooden spring-type clothespins are more apropos.

A “Machine for Shrinking Speeches” was revealed at the 1953 Institute of Radio Engineers convention in New York. This device, capable of contracting speech length without affecting voice quality, should go far toward prolonging tube life expectancy in the rigs of some amateurs.

TAN (Teen-Agers’ Net) operates every Saturday night at 1830 EST on 7175 kc. W1UTH invites other interested “young squirts” to join up.

A radio club for juniors aged 9 through 14 meets regularly in Philadelphia. Code sessions and theory periods are featured and newcomers are welcomed. Interested lads are invited to contact Fox Chase Radio Club, George Pfisterer, jr., president, at 914 Napier Avenue, Philadelphia 11, Penna.

W60QY tells us that one dollar sent to the Coronado Radio Club, Box 277, Coronado, Calif., will secure any interested party a 1953 directory of over 1300 San Diego county amateurs, cross-indexed three ways. It has additional features and is a valuable reference in traffic work.
LOCAL amateur radio publicity has increased manifold in the past few years. Largely through the work of clubs, but also through individual efforts, newspapers throughout the nation have carried thousands of stories on the activities of amateurs. The desirability of this tremendous achievement is obvious. But it is also one of those things of which there can never be enough — like candy and ice cream at a child's birthday party.

Amateur radio needs continued good public relations. Public relations is the job of selling one's self or one's group activity. Our need is of two kinds. First, the selling of amateur radio as an institution, as an organized body. Second, the selling of the individual amateur as a useful member of the community. The first is primarily the responsibility of Hq. The second is primarily the job of the individual member or club.

One of the most useful tools is publicity. Publicity in effect, is the voice of public relations, the practical and effective way of spreading your story and forming favorable opinions.

Publicity is news. News about you. About your fellow hams and your club doings. Publicity has become an accepted form of newsgathering, actually welcomed by editors whose staffs are unable to cover all events and report all news happening within their cities or towns. Editors are grateful for publicity — of the right kind. By the right kind we mean that which is newsworthy.

What is news? So far as the editor of a newspaper is concerned, it is anything that interests his readers. A news story can be built around almost any occurrence. One difference between a good publicity man and an average one is the ability to recognize news angles in ordinary events. We hams too often let opportunities for local news stories slip by because the events seem too commonplace to our everyday ham activities. The important thing is to develop a "nose for news" — to look at each and every event in your club or your personal amateur radio activities with the thought, "How can this be worked up into a good news story?" As you gather experience, and particularly as you make contact with local editors, you will see just what makes news to them and therefore what events in your own affairs are newsworthy.

The adjacent tabulation, taken from the publicity manual, supplied by Hq. to each ARRL affiliated club, is an illustration of some of the events which have news possibilities. Of course some rate higher than others — a routine club meeting might get a few sentences in the local paper; some unusual emergency activity probably rates page one, with pictures.

Let's take one simple example — No. 18, "Individual gets amateur license." What's so newsworthy about that? It's done every day of the year, isn't it? Sure. Some thousands of licenses are newly issued each year by FCC. And that means thousands of publicity possibilities for amateur radio. Now, when Joe Doakes of Podunk, Ohio, gets his Novice license it's of no interest whatsoever to the general public in Cleveland or Toledo or any outside place. But it's news in Podunk. Joe, one of the local citizens, has a Federal government license authorizing him to operate a short-wave transmitter from his home. Sounds a little more impressive that way, doesn't it? Joe doesn't need to be a seven-year-old prodigy or some other unusual case. As a citizen of the community, the out-of-the-ordinary things he does are of interest to his fellow townspeople. And passing a Federal radio license examination is by no means ordinary.

A story of that nature could bring in lots of possible angles — how long Joe studied, where he went to take the exam, how difficult or easy he found it, how nervous he was during the code test, what sort of gear he has in his station, his first contact, what Joe does for a living, etc.

Obviously, we're talking about smaller towns and communities, primarily. The Chicago Tribune for example, simply wouldn't have space for such an item even concerning a Chicagoan unless it
were an unusual case. In the metropolitan areas, however, there are community papers where a simple story such as this would obtain space.

Unless your sole amateur activity is routine rag-chewing, certainly some aspect of your hamming is newsworthy. Perhaps you handle an overseas GI message, bringing a local family the first news in weeks of their son in military service. Perhaps you knock off your 45th state, or 6th continent, or 100th country. Perhaps you are training a few Boy Scouts to become amateurs. Perhaps you have some unusual mementos of ham friendships, such as a set of wood carvings sent you by a long-time DX friend. There are many possibilities. The point is to recognize them. Such items are good local news.

How do you get your item in the paper? If you know the editor or a member of his staff personally, you’re all set. More likely, you don’t. If the item is hot news, such as emergency work in progress, telephone it. But if it has no vital time element, mail it in.

News stories should be neatly typewritten, double spaced on one side only of standard 8 1/2 by 11 white paper. Your name, address and telephone number should appear in the upper left-hand corner. If you are the publicity man for a club or group, add its name. Then the editor can contact you for additional information, if needed. Always leave adequate margins and start your story about one-quarter the way down the page. This gives the editor plenty of space to mark the copy up to suit him.

Don’t try to be fancy in your writing, or overly dramatic, or you’ll create a bad impression. State the item in plain, simple facts. If you’ve got a story, a poor writing job won’t hide it completely. If you haven’t got a story, no amount of high-power writing is going to fool the editor. He’s in the business. He’ll probably rewrite parts or all of it to suit himself, anyway.

With your release in the hands of the city editor, he may turn it over to a reporter for follow-up. The reporter will be in touch with you and some of the questions he may ask might sound odd. Don’t question his approach to the story — your task is to supply him with information.

Routine releases on club meetings may rate prominent space in small dailies or weeklies, but in larger papers they are usually relegated to a special club column or at the most a few lines of type. In large cities, it behooves the amateur radio publicist to concentrate on the more important stories such as Field Day and civil defense participation. Many of these will result in a personal follow-up by a reporter to develop additional news angles and obtain more information. Here, cooperation is the keynote of success.

Photographs are important but unless you have a club member or friend who can turn out finished work there is not much sense in submitting small, amateur photographs. If the editor feels the event merits a photo, you can be sure he will see that a staff photog is there to cover it. One-shot affairs and occasional publicity releases serve their purpose — but what amateur radio needs is continual publicity. You may not always get a release published; you may find the city editor blue-pencilling your copy all the time — the important thing is to always keep pitching. Contacts on the paper help tremendously — many times it will mean the difference between big story and a few paragraphs buried inside the paper. Cultivate and build up your contacts. Perhaps you can even get your reporter friend to become an amateur radioman!

Newspaper publicity is a primary form for club groups and the techniques of writing effective copy should be aimed at the press. However, they are equally adaptable to company and community magazines and house organs.

Publicity, however, does not only take the form of the printed word. There are other forms in which clubs and individuals both may participate. Foremost among these is the hobby show or county fair. Throughout the year, ARRL Headquarters provides assistance in the form of

(Continued on page 189)

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**Examples of Incidents with News Value**

**Club Affairs**
1. Election of officers
2. Routine club meetings
3. Guest speaker at meeting
4. Code and theory training classes
5. Club sponsors pleats or hamfest
6. Club station activities
7. Club forms committee; e.g., TVI
8. Club sends delegation to division convention
9. Club sponsors local contest; e.g., WAS
10. Club scores in ARRL contests
11. Club plans for Field Day, SET, etc.
12. Club supplies special communications; e.g., boat races
13. Club anniversary
14. Club radio exhibit in local store
15. Club official addresses civic group
16. Club publishes local news bulletin
17. Club participates in civic project

**Individuals**
18. Individual gets amateur license
19. Amateur enters military service
20. Amateur achieves prominence in another field
21. Amateur wins operating contest for his section
22. Amateur makes WAS, WAC, DXCC, etc.
23. Individual traffic-handling achievement

**Civil Defense and Emergency Communications**
24. Club station acts as NCS
25. Local emergency corps set-up
26. Tie-in with civil defense activities
27. Local demonstration of emergency facilities
28. Simulated Emergency Test participation
29. Field Day participation
30. Actual work in emergency

**General**
31. Unusual happenings — e.g., mobile communications at an automobile wreck
32. Boy-meets-girl via amateur radio
33. Chess by radio
34. Career story of prominent ham
35. Message delivered from overseas service man

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May 1953 51


Results — Nineteenth ARRL Sweepstakes

The Nineteenth ARRL Sweepstakes, held November 15th-16th and 22nd-23rd, was a well-attended affair marked by snappy push-to-talk and tape flats. Conditions, though far from ideal, were good. Many contestants found the prevalence of “long skip” a real help in raising those tougher sections, but admittedly it was more of a chore to pile up huge contact totals. Be that as it may, 8.4 per cent more entrants — including a record number of club participants — were on hand to parcel out QSOs this year, and log comments indicated almost unanimously that “a good time was had by all.”

Award Winners

Of the 1152 logs submitted by contestants, 957 were for c.w. and 195 for phone participation. As in the past, competition for awards was intrasectional. Accordingly, certificates are being given to the high scorers in all of the 71 sections from which c.w. entries were received and to phone winners in 58 sections. The call of an award winner appears at the head of each section in the tabulation of scores beginning on p. 54. The high degree of operating know-how the which the winners displayed surely merits the congratulations of the entire SS fraternity!

Leading Brasspounders

At the head of the pack nationally was W4KFC, Vic Clark, a contest master who needs no introduction to those who follow operating activities. Vic, high in the 1950 fray, returned to the top spot in 1952, scoring 188,100 points by virtue of his 1048 contacts in all sections. The equipment at W4KFC included: transmitter, VFO-807-HK257 at 100 watts; receiver, BC-548; antennas, 138-foot long wire, 7-Mc. ground-plane, 14-Mc. two-element rotary.

In second position, but close on Vic’s heels, was perennial SS star W3DGM with 187,650 points. Mel’s total stemmed from 1043 exchanges in the 72 sections. He used p.p. 807s at 100 watts and a NC-101X receiver.

In the phone section, SS newcomer Al Pichitino, W9EDX, earned the Minnesota award and the distinction of being the only entrant to tally a six-digit score.

Third-place honors went to W9IOP, who snagged 1052 stations in all sections for a 186,600 point total. Larry’s all-time record for number of contacts — 1100 as W81OP in the previous SS — still stands despite the efforts of this year’s entrants.

After the big three, these operators scored over 125,000 points: W3BES 181,710, W6BJU (W6-CUF, opr.) 175,104, W7PGX 169,513, W9RQM 168,840, W3CTJ 162,540, W4BGU 159,930, W3GAN 155,070, W3EIS 154,080, W7KEV 151,674, W3GHM 149,760, W3AB 149,580, W3JKH 147,858, W9EURU 144,000, W8WZ 144-000, W7GEB 141,120, W9YCR 139,125, W6EPZ 135,788, W9WFL 127,440, W3JTC 125,563, W7KVL 125,010.

The top scorers by licensing areas were as follows: W8IY 118,170, W2GFC 124,118, W3-DGM 187,650, W4KFC 188,100, W5MCT 122-700, W6BJU 175,104, W7PGX 169,513, W8WZ 144,000, W9IOP 186,660, W9YCR 139,125, K161J 61,200, K1740 25,149, K8JQ 70,305, K25BC 25,326, VE1AR 78,913, VE20L 44,318, VE3AWZ 80,288, VE4ER 10,665, VE5QZ 98,460, VE6MA 47,043, VE7JO 51,150. For the second consecutive year VE5QZ tallied tops for Canada; he was also the only VE to knock off all sections.

All ARRL sections were active as evidenced by the number of brasspounders who eked out QSOs with all 72. The following operators qualified for the full section multiplier: W1EOB, W1RY, W3ADZ, W3ALB, W3BES, W3CTJ, W3DGM, W3EIS, W3EVW, W3GAU, W3GHM, W31YE, W3KT, W3LVF, W4BGU, W4HQN, W4KFC, W4SHJ, W5MCT, W6HIP, W7GEB, W7KVL, W7PQE, W7YG, W8WZ, W9DWD, W9EURU, W9IOP, W9RQM, W9WFL, W9YFY, VE5QZ. An additional 31 operators missed only one section each.

With each succeeding SS more brasspounders climb to the 800-plus level in numbers of contacts. These 18 did it this year: W8IOP 1052, W4KFC 1048, W3DMG 1043, W3BES 1010, W6BJU 989.

Eugene Hubbell, W9ERU, walked off with the Illinois section c.w. award by working all sections and rolling up 144,900 points from 806 QSOs.
with 703 QS0s in all sections but Canal Zone. The line-up at W6GQZ included an elaborate assortment of arrays tied on to a KW-1 at one kw.

Another Westerner, W7PUM, was next with 96,255 points. Warner, with just 70 watts, logged 465 stations in 60 sections.


The licensing area leaders were: W1JEL 38,430, W2N6D 46,242, W3LXE 46,735, W4PJU 83,283, W5MYI 51,188, W6GQZ 99,684, W7PUM 96,255, W8AJW 56,826, W9NDA 91,728, W9EDX 108-972, KH6MG 29,800, K17AON 19,743, VE1CM

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**Club Scores**

<table>
<thead>
<tr>
<th>Club</th>
<th>Score</th>
<th>CW, Winner</th>
<th>'Phone, Winner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potomac Valley Radio Club</td>
<td>2,772,753</td>
<td>W4PFC</td>
<td>W4NTZ</td>
</tr>
<tr>
<td>Franklin Radio Club</td>
<td>2,635,936</td>
<td>W4KDF</td>
<td>W4KDF</td>
</tr>
<tr>
<td>Ohio Valley Radio Association</td>
<td>1,277,399</td>
<td>W4SSRP</td>
<td>W4KZF</td>
</tr>
<tr>
<td>St. Louis Radio Club</td>
<td>678,744</td>
<td>W4QG</td>
<td>W7KLC</td>
</tr>
<tr>
<td>York Radio Club</td>
<td>378,456</td>
<td>W6YV</td>
<td>W7KLC</td>
</tr>
<tr>
<td>Detroit Amateur Radio Association</td>
<td>320,392</td>
<td>W4VJ</td>
<td>W7KLC</td>
</tr>
<tr>
<td>Ohio Amateur Radio Association</td>
<td>301,399</td>
<td>W4LXY</td>
<td>W7KLC</td>
</tr>
<tr>
<td>South Jersey Radio Association</td>
<td>227,300</td>
<td>W2PAP</td>
<td>W7KLC</td>
</tr>
<tr>
<td>Southeast Amateur Radio Club</td>
<td>273,861</td>
<td>W2PAP</td>
<td>W7KLC</td>
</tr>
<tr>
<td>Wisconsin Valley Radio Association</td>
<td>260,175</td>
<td>W3PAP</td>
<td>W7KLC</td>
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<tr>
<td>Associated Amateurs of Long Beach</td>
<td>264,174</td>
<td>W4LXY</td>
<td>W7KLC</td>
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<tr>
<td>Milwaukee Radio Amateur Club</td>
<td>238,655</td>
<td>W4PRL</td>
<td>W7KLC</td>
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<tr>
<td>Garden State Amateur Radio Association</td>
<td>191,265</td>
<td>W4PRL</td>
<td>W7KLC</td>
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<td>Southern Amateur Radio Club</td>
<td>186,300</td>
<td>W4PRL</td>
<td>W7KLC</td>
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<td>Buckeye Short Wave Radio Association</td>
<td>184,376</td>
<td>W6KRY</td>
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*May 1953*
The Twentyventh Sweepstakes is scheduled for the week ends of November 14-15 and 21-22, 1953. Keep track of those dates and start making your SS plans now. Why not get the TVI licked and the antennas pruned right away! Remember, those new 'phone bands and the Santa Barbara section will be there to live up the proceedings. See you in November!

**C. W. SCORES**

### Nineteenth Sweepstakes Contest

Scores are grouped by Divisions and Sections. The operator of the station first-listed in each Section is award winner for that Section unless otherwise indicated. Likewise the “power factor” used in computing points in each score is indicated by the letter A or B. A indicates power up to and including 100 watts (multiplier of 1.25), B indicates over 100 watts (multiplier of 1), C indicates over 100 watts (multiplier of 1.25), and D indicates over 100 watts (multiplier of 1.25).

The twenty-first Sweepstakes is scheduled for the week ends of November 14-15 and 21-22, 1953. Keep track of those dates and start making your SS plans now. Why not get the TVI licked and the antennas pruned right away! Remember, those new 'phone bands and the Santa Barbara section will be there to live up the proceedings. See you in November!
No doubt about it, Fred was quite a boy. I can remember when he first joined the club back in the winter of ’54, and you’d never have guessed then what would happen later. One of the members who worked with him over at United Research introduced him, and as I remember Fred didn’t make a very big impression at the time, probably because he was sort of small and didn’t have much to say. It turned out he was some kind of physicist, maybe more like a mathematician, really, because his job was working on one of those electronic calculators, and I guess it was his training that helped him pull it off. Like his being the first ham I ever knew to have practically his whole station — receiver, transmitter, everything but the final — all built up using transistors. Seems he’d had a ticket for a couple of years, and when he joined the club he was active on the traffic nets and did a little DX on the side, just regular stuff as far as operating goes.

The guys in the club are great ones for contests, you know. We’d been going along pretty much as usual, and when the time came around for the ’55 Sweepstakes, the boys began beating the drums for activity, and Fred was in the bunch of a dozen or so who swore they’d be on to build up a club score. We did pretty well that year, too, although the Frankford gang and a couple of others nosed us out, as always, but we felt good about the showing we made. Fred did all right. His score wasn’t in the club’s top four or five, but he was right in there pitching during the contest, and he was real enthusiastic about it beforehand. Apparently he hadn’t ever had much time for contests before, and that year was the first time he got his feet wet. I talked to him about it afterwards, and I thought he’d done real well, never having any contest experience, but he didn’t seem satisfied. Anyhow, the boys were glad to have him.

During the next year, he was pretty active. He got into all the DX contests and the Field Day, but when the fall of ’56 rolled around, we didn’t see much of him, and the fellows who were trying to line up a good team for the ’56 Sweepstakes were a little afraid he might not take part. All we could get out of him was that he’d be in the contest but he was busy and couldn’t get down to club meetings very often, so we left it at that.

Well, I suppose nearly everybody interested in the SS knows how it turned out that year. Fred rolled up a score that probably won’t be topped for a long time, if ever. Before that, the best anybody had ever done was a little over twelve hundred QSOs — in ’53, I think it was. Fred turned in just over two thousand, and the usual high men like 3BES, 4KFC, and 9I0P weren’t even close. Figuring it at forty hours’ operating time, it was better than fifty QSOs an hour on the average, which is really rolling in any kind of contest.

Nobody believed it, of course. When Fred showed up at the next club meeting and turned in his score, the boys thought he was kidding at first, and when he insisted it was right, some of them got kind of mad. There was a big discussion on whether we should even send it in with the club list, and Fred wasn’t making things any easier because he wouldn’t tell us how he did it. In the end, we did send it in, but with a lot of misgivings all around. We were right. The gang up at West Hartford didn’t believe it either, although they cross-checked his log with all the other stations who sent in scores, and they admitted they couldn’t find anything wrong. What they finally said was there must have been more than one operator, and they wouldn’t allow the score unless Fred could explain how he did it. If it hadn’t been for that, I guess we never would have found out.

A week or two afterwards, Handy came down from the League, and Fred invited him and the rest of us over to his shack. His station was built in the garage, and when I say built in, I mean it, because there just wasn’t room for a car any more. There was gear all over the place. I couldn’t recognize most of it, but there were separate rigs
for each band, a couple of magnetic tape recorders, an electric typewriter, and four receivers with selsyn-controlled tuning, in addition to the rest of the stuff. I'm no expert on this kind of thing, and it was all written up in QST a couple of years ago, but the way I understood Fred it was something like this:

He had built himself what was practically an automatic station. First, he had an electronic memory gadget that recorded the calls of every station he worked. The calls weren't recorded in regular c.w. but in some kind of special code Fred said he'd worked out from “information theory,” or something like that. Then he had four receivers mechanically scanning any band or combination of bands he wanted. The receiver outputs were fed into a computer and feed-back control that was set up to zero the tuning on any signal sending CQ SS or a call. As soon as the station sent a DK, the computer compared the call with all the calls recorded in the memory. If it was a call he'd already worked, that receiver would go on tuning. If it was somebody he hadn't worked, the receiver would sit there, and one of his VFOs was automatically zeroed onto the receiver frequency. Meanwhile, one of the computer sections prepared a magnetic calling tape with the call of the unworked station. The calling tape was switched into the transmitter as soon as the other station signed, and he had an interlock set-up so that only one rig could be on at a time. If the guy came back, the incoming dope was recorded on another tape and went from there into the computer, and if everything was received OK, a message tape was cut into the transmitter with all the regular stuff on it — number, time, and so forth — and the incoming tape was erased for the next one.

I know there are always dead spots in the contest when you can't seem to find anything, but Fred had thought of that too. He could limit the search time of any receiver to from fifteen seconds to two minutes, and if the receivers didn't find a new call in that time, one of the rigs was automatically set to a frequency two kc. from the nearest pile-up, and a three-times-two CQ tape was turned on. Of course, he could run CQs any other time he felt like it. You know how those IBM punch-card machines work? Well, that's more than I do, but anyway Fred had one that punched out a card for each QSO with all the dope on it like band, QSO number, and so on. That took care of the logging work, and when the contest was over, he simply ran the stack through a card reader and electric typewriter that typed out the log for sending in to ARRL. Matter of fact, Fred didn't really have much to do, except watch the stuff to be sure everything was running all right, because the computer even answered requests for fills — and got them — all by itself. Fred said the only time the machine got balled up was when it latched onto some guy who kept asking what the SS was! He did say that most of the time, just to keep awake, he monitored whatever receiver was in use and selected the RST report to be sent — by punching a button — but he didn't even have to do that. Sometimes he just locked in the RST-570 selector and let her rip. That's what you get most of the time anyway.

Pretty slick set-up, I thought. Something a lot of fellows have dreamed about, probably, but Fred just happened to be the first one to get busy and work on it. Sort of specialized, and certainly nothing for just chewing the rag or even working DX, but for the Sweepstakes it was strictly fine business. Fred? Well, the last I heard, he was out on the West Coast and had taken up flying. Got out of ham radio altogether, it seems!

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25 Years Ago

May 1928

... The theme this month is the opening of our new 10-meter band and ARRL Secretary Warner's editorial speculates on its communications potentialities.

... “Getting Started at 30 Megacycles,” by Robert S. Kruse, QST Technical Editor, discusses technical considerations bearing upon our newest band.

... For straightforward and foolproof performance at 30 Mc., J. T. McCormick, 9BHR, recommends his favorite oscillator in “Ten Meters and the Ultradion.”

... The Communications Department already lists reports of considerable 10-meter activity and schedules a special international test on Ten for May.

... Federal Radio Commission's newly adopted definition of amateur radio — stations operated "without peculiar interest" — should exclude ham-band intruders.

... Carleton H. Kohler, 9EFO-9EZM, tells how the Minneapolis-St. Paul gang is tickling the BCL interference problem with "The Twin-City Vigilance Committee."

... "Amateur Television," by Paul H. Thomsen, 3LA, points out essentials of General Electric's television system and shows how simple receiving apparatus functions.

... League Director Eugene C. Woodruff, SCMP, describes some of his effective test gear in "A Combination Fieldmeter-Wavemeter-Voltmeter."

... Technical Editor Kruse leaves ARRL for the radio consulting field; Harold P. Westman becomes Technical Editor and Ross A. Bull, Associate Technical Editor.

... James J. Laub, 3CEI, and G. Donald Mizerve, 1FL, come to ARRL in technical and advertising staff capacities, respectively.

... In his "Rotten DX," The Old Man raps the knuckles of ill-mannered DXers who call CQ all night long and cut off all QSOs abruptly with brusque TX.

... A descriptive write-up of 6CMQ, owned by F. T. Swift, Jr., of Altadena, Calif., features some of the station's varied receiving and transmitting circuits.

... On the Correspondence pages, B. N. Dingley, Jr., A. Binneweg, Jr., and F. A. Libby, 8HAG, argue moot points of r.f. choke coil design and operation.

May 1953 59
The Radio Amateur Civil Emergency Service

Part III — Funds and Frequencies

This is the last of three articles on RACES that started out to be two articles. Much more might have been said. However, if the series has introduced this new amateur service to some readers and has clarified any points for others, it has served its purpose. As space permits, we hope to run additional material on RACES from time to time.

Funds

Many amateur groups, particularly those strongly organized under the AREC, are not much concerned with this problem. They fall into two categories. One is the category which finds that there are simply no funds available, so they set out to provide an amateur service for civil defense without financial support. Another category is the group which knows funds will be forthcoming if they show they can do the job, so they set out to do just that. These are in strong contrast to the group which, not being already organized under AREC, finds that civil defense is not going to finance them and therefore steadfastly refuse to have anything to do with it. We leave it to the reader to figure out which type of amateur group is doing the most good for the amateur service and for the public interest.

The question of who is going to pay for the equipment is one which is frequently asked by amateurs and ECs preparing to participate in RACES. In some places (Detroit, Dayton, etc.) amateurs have found financial support from other than government circles, and have made the most of it. Generally, however, funds for the purchase of civil defense gear, radio and otherwise, stem from the instrumentality of government responsible for the implementation of RACES at the local level — that is, your community. It is at this level where the first responsibility and initiative for all civil defense measures arise. Once that initiative has been taken, state and federal governments are in a position to assist, the degree of assistance varying widely among the different states from practically zero to almost complete control of the civil defense program.

The Federal Civil Defense Administration has under way a Federal Contributions or "Matching Funds" Program under which the federal government contributes one half of all (up to a certain limit) civil defense expenditures which fall within certain categories and meet certain specifications. Because federal funds available for this purpose are limited, they are at present available only for purchase of equipment in designated "target areas." Even within these areas, only that equipment most essential to c.d. requirements can be considered. The FCDA hopes that this lack of funds will not restrict the implementation of RACES. On the contrary, it is hoped that personal initiative at the local implementing level will draw upon, and utilize to the maximum, communications systems already established by amateurs. This does not, of course, preclude the consideration of more liberal or changed criteria and conditions should subsequent developments make this possible.

At the present time, the specifications are somewhat higher than can be met by the average equipment sold to or used by amateurs, while the equipment which can meet the specifications is higher in price than the average amateur and some civil defense authorities feel it necessary or possible to pay. Thus, some controversy has arisen on this point. FCDA argues that with limited funds we cannot afford to take chances on questionable equipment, that we need gear which will maintain high standards and stand the gaff. Opponents have argued that we ought to get the most equipment we can for the money, and that it is unjust to apply commercial equipment standards to equipment designated for use in an amateur service. We do not intend trying to settle the argument here, or even to discuss it fully. What does need to be pointed out is that the FCDA specifications are not the requirements to be met by all equipment to be used in RACES, but only the specifications for equipment eligible for matching funds.

Therefore, in connection with the Matching Funds Program, it might be well to examine carefully how the most and best equipment can be obtained with the funds available — that is, whether a better job can be done with inexpensive equipment without matching funds (as New York state has decided to do it), or with the more expensive variety purchased with the aid of matching funds. In the final analysis, this is not a matter for decision by us amateurs; it is within the prerogative of the holders of the purse strings — and that means local government authorities. All we can do is explain our capabilities in a given situation.

Frequencies

The frequencies for RACES were announced over a year and a half before the RACES regulations had been finalized, so you might think we would be all straightened out on that matter; but such is not the case. The principal difficulty seems to be that amateur equipment and amateur inter-
est, generally speaking, do not concentrate on those frequency bands which FCDA officials feel technically best suited to the business at hand — namely, the 6- and 2-meter bands for mobile and local work and the 80- and 75-meter bands for statewide and interstate use. What about the 10-meter band? FCDA officials are becoming more skeptical at the prospect of the band opening up for short and long skip as against dependable and exclusive ground wave propagation — to the extent that matching funds will no longer be approved for further expansion on ten meters. The concern is with both practical (QRM) and security aspects in the event of widespread enemy action simultaneous with a band-opening. When you think about it, it could be a terrible mess at that!

But we have to be practical about these things. The fact remains that majority mobile interest is still on 10 meters, and what interest is draining away from this band is going toward 40 and 75, not the other way as desired for civil defense purposes. The reason for this trend is just that amateurs naturally gravitate toward those bands where they will have plenty of company, and those bands for which manufactured equipment, both receiving and transmitting, is generally available. The possibility of sporadic DX work is also a lure — a factor just the opposite of the ideal for civil defense work. So, whether we like it or not from a civil defense standpoint, probably most of our mobile installations will continue to be on 10 and 75, especially if we have to pay for them ourselves.

Even if we are supplied with funds for civil defense communications equipment, there is a strong practicality angle in establishing new equipment on frequency bands which can make the best use of existing amateur equipment. The changeover, if one is to be effected, must be accomplished gradually. Operation was initiated on 10 meters in the first place because of assurances that part of the band would be available for c.d. purposes in the event of war — assurances of all government agencies concerned. Once this assurance was given, heavy reliance on 10 meters for mobile and some fixed-station work was inevitable, considering the extent of amateur equipment operation there. Changing to six and two will not be easy, if indeed it will be possible.

So where does that leave us? It leaves us with cognizance of the desirability for increased emphasis (in local work) on six and two meters, and de-emphasis on ten and seventy-five. At the same time, we have to continue to do what we can with what we have. As a measure of recognition that the 6- and 2-meter frequency band segments are most desirable for local work, FCDA will no longer approve applications for matching funds for the establishment of complete new ten-meter systems. They will, however, approve requests for equipment to tie existing 10-meter systems with the applicable c.d. control centers. Anybody starting out from scratch should plan their local networks on six or two, if you want matching funds; others should effect migration to those bands if or as practicable.

Now let's talk about frequency channelization within the available RACES segments. Generally speaking, there are two basic proposals for channelization. One operates on the principle that RACES communications units should exist as such and be made available to specific civil defense services when and as the need arises; and that allocation of frequencies should be made on a geographical-separation basis. The other proposes that channelization should be according to the civil defense services in which RACES units will be used, so that the same services can have the same operating frequencies everywhere. The former is the way most c.d.-interested amateurs feel it must be done in view of personnel and equipment availability. The latter is the way all FCDA services would like to see it done. Unfortunately, space does not permit us to go into any great detail on either plan, but let's try to get across the salient points of each.

As early as May, 1951, a group of amateur representatives from ten northeastern states got together to confer on RACES matters, chief among which was to channelize the frequencies.

The v.h.f. allocations plan proposed by the Northeastern States Civil Defense Amateur Radio Alliance divides each state into four "quadrants," lettered as illustrated, and then assigns channels within the RACES segments consecutively in quadrants A, B, C, and D. In this way it is not possible for adjacent quadrants to have assignments closer than one-channel separation.

The ABCD Plan being used by fourteen states in FCDA Regions I and II. See text.
available for RACES. Subsequent to the ideas ex-
pounded at and the proposals emanating from
that meeting, similar meetings of this representa-
tive group have been held every six months.
While the whole aspect of the Northeastern
States Civil Defense Amateur Radio Alliance is
of interest, we can discuss here only the v.h.f.
allocations, which we wish to do because they are
best representative of the thinking involved to
overcome the very obvious shortage of channels
and consequent possibility of adjacent-channel
(or adjacent area use of the same channel) QRM.
The device used is very simple, but rather in-
genious. As can be seen in the drawing, each state
(with Long Island considered a separate state)
is divided into four quadrants labeled A, B, C and
D. The drawing shows example only and not
necessarily the actual quadrants, which will gen-
erally follow natural or political boundaries.
Channels are assigned in these quadrants succes-
sively with a separation of 10 kc. on 10 meters,
20 kc. on 6 meters and 30 kc. on 2 meters.

Just for an example, suppose we consider the
6-meter band, with RACES segments 50.35-
50.75 and 55.35-55.75 Mc. Since the plan calls for
20-kc. separation on six, we assign the first chan-
nel at 50.380 kc. in the A (northwest) quadrant,
the second at 50.380 kc. in the B (northeast)
quadrant, the third at 50.400 kc. in the C (sou-
east) quadrant and the fourth at 50.120 kc. in the
D (southwest) quadrant. Note that no adjoin-
ging state will be assigning those same frequen-
cies to an adjacent area, since such an area will be in
a different quadrant, at least 20 kc. away, and
usually more. Now if we need more channels in
the same quadrant — the A quadrant, for ex-
ample — the next one assignable in rotation is
50.440 kc., a full 80 kc. away from any other
channel being used in that quadrant, and at least
20 kc. (judicious allocation can invariably provide
for much more) from any channel being used in
any adjacent quadrant of the same state or other
state. The same system is used for channels in the
RACES segments of the 10- and 2-meter bands,
with less and greater separation respectively.
Under the “Quadrant” or “ABCD” Plan, there
are 38 channels available on ten meters, 40 on six
meters and 34 on two meters. No channelization
is considered necessary on 220 Mc. Medium- and
long-distance radio communication required will be
accomplished on the lower-frequency RACES
segments and the Disaster Communications
Service.

FCDA’s frequency allocations plan is only
tentative, and should in no case be construed to
be in final form. We present its salient points
here only to show the direction of their thinking
to date. It also provides for medium- and long-
distance facilities on the lower frequency seg-
ments, including the Disaster Communications
Service Band. On v.h.f., the FCDA plan makes
no provisions for allocations on the 10-meter
RACES segments, saying only that any frequency
within the RACES segments may be used.

On six meters, FCDA makes provision for both
a.m. and f.m. on the lower segment (although
only a.m. is now permitted) and for only f.m.
on the upper segment. The a.m. allocation is
based on 8-kc. channel separation, providing
a total of 50 channels, 48 of which are to be
used and two of which are retained as “guard
channels” of the 48 channels, 19 are for fixed,
mobile or portable, 17 are for mobile or portable
only, and 12 are for portable only. The f.m.
channelization of the same segment provides
eight 40F3 channels starting 20 kc. within the
low end of the segment, thence every 40 kc.
except avoiding the a.m. “portable only” channels.
In addition, provision is made for doubling these
f.m. channels by use of “split-band” f.m. (20F3).
In the high-frequency six-meter segment, chan-
nelization is for ten 40F3 channels or nineteen
20F3 channels. Four of the 40F3 channels are for
fixed, mobile or portable; if 20F3 is used, seven
such channels are available. Four 40F3 channels
are also available for mobile or portable; if 20F3
is used, eight channels are available. One 40F3
or three 20F3 channels are available for portable
only. The other 40F3 channel (53.53 Mc.) is the
nationwide liaison frequency for the civil defense
Transportation Service.

In the 2-meter RACES segments, the FCDA
frequency plan provides for f.m. only, either
40F3 or 20F3. Five of the 40F3 channels are des-
ignated for specific c.d. services (Engineering,
Health and Welfare, Fire, Rescue and Police),
these to be nationwide liaison frequencies for
those services. Aside from these, for general use
there are left (on the basis of 40F3) five channels
for fixed, mobile or portable, five channels for
mobile or portable only and three channels for
portable only; or, on the basis of 20F3, nine
for fixed, mobile or portable, fourteen for
mobile and portable only, and six for portable
only.

The above constitutes only a glimpse at two
ways of setting up the allocations on only
part of the bands available. It is complex and
somewhat confusing, but with a little close
study it is easy to see the basic differences,
which naturally enough represent differences in
viewpoint.

The NSCDARA (amateur) plan reduces the
problem to one of avoidance of interference be-
tween simultaneously-operating nets; it assumes
that available RACES communications units and
nets will be deployed, both frequencywise (within
proper quadrant, however) and servewise, at
local level in accordance with local strategies.

The NSCDARA plan also assumes primary reliance
will be placed on a.m. equipment, since that is
what most amateurs are equipped with and
familiar with.

(Continued on page 154)
Fourth Annual YL-OM Contest Results

The Young Ladies' Radio League found it generally agreed that their 1953 YL-OM contest—the fourth annual such affair—was the best yet. As predicted, more YLs participated than ever before, and gratifyingly enough, most of the OMs contacted knew what the contest was about, in contrast with previous years. W1 YL participation was heaviest. Only one W6 log was received, and none came from the seventh district. Unfortunately, several YLs logged for credit were declared ineligible by the YLRL contest committee because they had apparently forgotten to pay their '53 YLRL dues and were temporarily discontinued from membership—a new ruling effective for the first time this year.

For having the highest combined score for the third consecutive year, OM winner W1BFT, Carl Evans, merited permanent possession of the gold cup donated by WSUDA. Carl deserves hearty congratulations.

Cups will be awarded to the following as designated: First award—YL WHILF and OM W1BFT. Second award—(phone) YL WHILF, OM W1BFT; (c.w.) YL W1FTJ, OM WA2JW. Third award—(phone) YL WA4SGD, OM WA2AJW; (c.w.) YL W9JUI, OM W1BFT.

Certificates will be awarded as follows: (c.w.—only) YL VE3AJR, OM W3AS; ('phone-only') YL WA4KJ, OM W1BF.

Individual scores follow, the three columns indicating each station's aggregate, 'phone-to-phone and c.w.-to-c.w. tallies, respectively:

<table>
<thead>
<tr>
<th>YL SECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WH1FT</td>
</tr>
<tr>
<td>WA4SGD</td>
</tr>
<tr>
<td>W4RKL</td>
</tr>
<tr>
<td>WS6CXC</td>
</tr>
<tr>
<td>WIYTYM</td>
</tr>
<tr>
<td>W1FTJ</td>
</tr>
<tr>
<td>W4STH</td>
</tr>
<tr>
<td>W9JUI</td>
</tr>
<tr>
<td>W3MAX (QF)</td>
</tr>
</tbody>
</table>

W8HLF, Arlie Hager, of Beckley, West Virginia—top YL scorer in the Fourth Annual YLRL YL-OM Contest. Five youngsters keep Arlie and OM W8VPO quite busy. W8HLF was licensed in 1951.

OM SECTION

|  |
|-----------------|-----------------|-----------------|
| W1BFT           | 11,440          | 4,250           | 4,080 |
| WA4JW           | 8,880           | 3,150           | 4,140 |
| W2BRR           | 7,560           | 1,870           | 2,850 |
| WS6DD           | 5,000           | 720             | —    |
| W20IB           | 4,800           | —               | —    |
| W4ARR           | 4,360           | —               | —    |
| W4NTT           | 3,840           | —               | —    |
| W4OMW           | 3,570           | —               | —    |
| W3AS            | 3,520           | —               | —    |
| W8YGR           | 3,520           | —               | —    |

Twenty-five YLs of the Los Angeles Young Ladies Radio Club ensured themselves of dates with their OMs on St. Valentine's Day by arranging a YL-OM dinner. The OMs promised their presence for at least two club socials a year and even discussed the possibility of organizing a YL-OM club on a national basis. (Photo by W6NSH)
Armed Forces Day—May 16th

The Army, Navy and Air Forces are co-sponsors of a program for the participation of amateur radio operators in the celebration of Armed Forces Day, Saturday, May 16, 1953.

C.W. Receiving Competition

A c.w. receiving competition will feature a message from the Secretary of Defense. All individuals, amateur operators and others, are eligible to participate. A certificate of merit will be issued to each participant who makes perfect copy. Transmissions will be at 25 words per minute on the following schedules:

<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Frequencies (kc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000 (EST)</td>
<td>AIR</td>
<td>3497.5, 6997.5, 27994</td>
</tr>
<tr>
<td>NSS</td>
<td>121.35, 4596, 9425, 12.804, 17,050.5, 23.981</td>
<td></td>
</tr>
<tr>
<td>WAR</td>
<td>14,405, 20,994</td>
<td></td>
</tr>
<tr>
<td>2400 (EST)</td>
<td>AIR</td>
<td>3497.5, 6997.5, 27994</td>
</tr>
<tr>
<td>RING</td>
<td>114.95, 9277.5, 12,966, 16,265</td>
<td></td>
</tr>
<tr>
<td>WAR</td>
<td>14,405, 20,994</td>
<td></td>
</tr>
</tbody>
</table>

Each transmission will commence with a five-minute CQ call. It is not necessary to copy more than one station and no extra credit will be given for doing so. Transcriptions should be submitted "as received" and no attempt should be made to correct possible transmission errors. Copies should be mailed to Armed Forces Day Contest, Room BE1000, The Pentagon, Washington 25, D. C.

Radioteleype Receiving Competition

An innovation this year will be a radio teletypewriter receiving competition which will feature a special message from the Chief Signal Officer, U. S. Army; the Director, Naval Communications; and the Director of Communications, U. S. Air Force. A letter of acknowledgment will be sent to each amateur participant who submits a copy made from the radio teletypewriter transmission of this message. Transmission will be at 60 words per minute on the following schedules:

<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Frequency (kc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1300 EST</td>
<td>NDC</td>
<td>7375</td>
</tr>
<tr>
<td>1300 CDT</td>
<td>NDS</td>
<td>7375</td>
</tr>
<tr>
<td>1300 MST</td>
<td>NDNP or NDW2</td>
<td>7375</td>
</tr>
<tr>
<td>1300 PST</td>
<td>NDW</td>
<td>7375</td>
</tr>
</tbody>
</table>

Each transmission will commence with a period of ten minutes of test and station identification to permit amateurs to adjust their equipment. At the end of the test period, the message will be transmitted. It is not necessary to copy more than one station, and no extra credit will be given for doing so. The message should be submitted "as received." No attempt should be made to correct possible transmission errors. Mail copies to Armed Forces Day Contest, Room BE1000.

Preview—DX Contest High 'Phone Scores

As we go to press each mail continues to carry batches of contest logs. A preliminary analysis seems to indicate that W/VE scores are running higher than those of last year despite fair-to-middling conditions—perhaps the 7-Mc. 'phone band helped. It should be stressed, however, that the totals below are claimed and subject to a considerable amount of checking before presentation of the final results at a later date.


Entries from outside W/VE are, as always, the last to be received and presumably many more are on the way. Highest scores on hand so far include: VP6SD 155,805, GTIBS 68,880, K7AON 41,574, XE2W 28,428, G2PU 24,708, PJ2AA 22,194, LU1DDV 21,252, KG4AF 13,114, CE4BX 9178, IHRL 8436, TA3A 7500, L33PF 6720, HPIBR 6314, E35Y 6262, HC2OL 5796 PA0BRG 4528.

Strays

Tiring of dog-eared logbooks, W6GJZ found that a paperclip arranged to engage four or five pages at each corner will keep things neat and under control. On the other hand, W2FW clips off a small segment of the top right corner of each log page as he finishes with it. The page in current use then can be instantly located without fuss and bother, wear and tear.

WOEERE’s QSL stunt is a cinch if you’re lucky enough to reside where call-sign auto licenses are available. India ink and photography do the job.

(Continued on page 148)
CONDUCTED BY ROD NEWKIRK,* W1VMW

How:
The last bars of the Woff Houg Song had barely died away when brethren assembled at our yearly gathering of the DXHPDS — DX Hog- gery and Poetry Depreciation Society — quickly organized their annual exploratory probes of the depths of verse. And in no time at all our motley collection of would-be bards had plumbed through to bed rock.

Philadelphia Phil took the floor unsteadily and volunteered something from the fifth layer:

“Long chats with the rare ones are jolly
And I'll yak all I want to, by golly!”

Not a pal shed a tear
When Jim ruined his gear
On a ten-minute final finale.

Skillfully ducking the whirring Rettynitch inten- ded for Phil, charter member W1RWS rose to deliver a contribution of somewhat gory bent:

A VFO-swisher was Hans;
He would swing up and down all our bands —
Till a neighbor named Sam,
Who was also a ham,
Dropped over and chopp’d off Hans’ hands.

Then Albuquerque Al proved that Jeeves never should have passed out that last round of root beers by foisting this atrocity upon us:

We’ve all heard Tail-Ender McRoon
Who calls, calls and calls until doom;
When at last he does sign
Not a soul can define
What said what and for and to whom.

Which was enough to adjourn the meeting in a clatter of shattering furniture. We escaped with the above fragments of the minutes just in time to make our deadline with the mail to follow.

What:
DX echoes are still reverberating on one-sixty after one of the best lower-frequency amateur radio seasons in years. VE1EA, quite favorably located for such goings on, scored his third 1.8-Mc. Asian QSO on March 6th, with ZC4X. It was a 15-minute contact with an abrupt fade-out. VE1EA has a postwar record of 12 countries and 4 continents on 100 (14 countries all-time). Clarke’s other DX on 1.8 Mc. this season: EI1N, KP4DV, KVIAA, GA 6B6, 3PU 6JU, 6BU 6CJ, 6GM 6BL 6JR and 8KF. VE1EA was heard by ZL1AH and he also had a cross-band 160/80- meter contact with VF4RL — ZC4X caused such excitement on 160 with the aid of a vertical wire supported by balloon. We understand the thing blew away on him once or twice — W1BB’s vertical experiences this year brought him to conclude that a good horizontal is hard to beat. Stew’s skeds with Z33C haven’t paid off with a two-way yet but W1BB is consistently heard in Southwest Africa. In addition to the ZC4X QSO flashed last month, W1BB recently worked Ga 3PU 6JU 6B7 6CJ and 6GM while hearing the signals of 6BF, G1BUR, GW2FSP, KP4KD, KV4BR and VP9HDA. We 1BB 25Q8 9N9 9P2E and 9NWX were all reported heard by ZL1AH on schedule March 1st but the ZL was unable to break through for two-ways — — — — — — — — A local beacon station near 1730 kc. gave W2WC a rough time but he hit 160 for QSOs with EI1J, Ga 3PU 6JU and 6GM — — W3EIS made out well, too, working such 160-meter people as Ga 6CJ 6GM 6BF, KVIAA, KV4A and BB. Don lost no time in filling his DX Test c.w. G quota!

The spotty performance of eighty leaves something to be desired but the stalwarts keep knocking ’em off. In the DX Test, W2WZ wound up an unplanned 4-band contact series with CT4AB in under nine hours. Other four-benders that included 80 meters were reeled off with CE3AG, EA1AP, FA9RK, KZ4AF, KV4AA, VP9BF and ZS2A — — — W9HUZ fights his way through East Coast competition without much difficulty to work C3JXM (3507), CT5BO (3500), FASIH (3533), FURAQ (3505), EM7WD (3506), LUIEP (3507), PJ2AA (3531), TAA3A (3512), ZD4AB (3507), ZS8 9K (3515), 6R (3512) and 5A3TU (3515). Van also lists QSOs with nine other European countries which include CT1, HB8 and OK1 contacts — — W1ORP caught W9HUZ’s CT2 TA3 ZD4 and Z5T customers in addition to F99RZ, T12TG, VQ4 4BJP 5DLX, YN1AA, YV6DE and ZS2A (3502). Ed was apprised by Z9BSO that VK9QG looks for W9 on the land; we hear that W2PEO has already nabbed the VE1L, FE3BD is still stalked by W1ORP — W2WC accounted for CT2ZL1 ZS8 and 6A3 contacts while QST author W2AHW finds his location not bad at all for Oceania; VK2HC, ZL1 1MC 5GQ 9JF 3NE 9PL 39X and 3QX took Yardley’s bait in late February — — TAA3A picked off most U.S.-and-Canada call areas during the DX Test in March. According to W2YM/X, TAA3A finds the hours around 0400 GCT the most productive in his 80-meter rambles — — KL7ACO worked ZL1DU three times on 3.5 Mc. as Novice W77AOC, — — KG4AU (3508) and YU3BC (3512) are among W4KFC’s exotic collection; CN8MI (3508) was heard — — W8AND hasn’t been missing much on eighty. We worked EI2P (3520), PJ2AM (3551), PY2AH (3529), YV5FH, KI6ARA (3515) and KL7BR (3553) to reach the 3.5-Mc. 56-country mark — — K23NT’s first DX on this band was Q25FU — — CXs 1BP 1FY, O4s 1BG 1DW and YJ1AB (3515) are available on eighty, we understand — — So. Calif. DX Club’s Bulletin turns its spotlight on FF8AE (3502).

* DX Editor, QST.
That fat signal of VK3HW takes off from this well-engineered 4-element 20-meter rotary beam in Ballarat. It is wide-spaced at 0.2 wavelength, has a 45-foot boom and is 45 feet above ground level. RV Smith of Werribee, Victoria, and Lewis can be seen on the catwalk. (Photo via W4BEF)

W2EJM and W9LIC have a few good words to say about seventy-five 'phone. Al worked CN8GZ, CT1s BS CI QF, EA9 2OA 2QG 4DB, DL4OF, G2PU, HB9MX, KG6PM, OZ9R, ZLs I1W and 2BE, while Jack noted the availability of HK1BG (9501) and VP7NX (9559). Not bad for a "local" phone band!

Forty 'phone rapidly attracted many boosters. Temporary lash-ups are giving way to DX setups specifically designed for 7-Mhz, phone. Operating W4UJJ, WSONL/4 shook tensils with C0TEQ, CT1s BS CI KI9aS 1J MG, KJ6AX (7207), KP4UB, KV4BB, VP9 6NA 6SD 6W 9BD A, XE2W, ZLs 1MQ 2KK 3DL and 2SB8W. VQ3DT (7103) got away ....... C02a MF and OZ were observed doing rush business with the W/VE crowd by W8FMW and SWL S. Tonal comments on the big signal of HP31L (7100) ....... KJ6AX and ZL2JJ made W4RZP happy while W8ZS soaked up KE9AGB, ZL8 BYB 1YE 2AI 3KK, VK3BD and many Europeans ....... It will probably be some time before amateurs get 40-meter 'phone DX techniques down pat. European broadcasting QRMs will necessitate considerable finesse in efforts to communicate with certain parts of the globe at certain times. Here is an instance where DX stations may be forced into the desirable habit of supporting clearly listening frequencies!

Central and South American 'phones are gravitating toward the c.w. end of the 7-Mhz range, but so far haven't caused much increased difficulty for forty c.w. DX-workers, judging from our mailacks. W9HUF found the band good for c1Ts AP (7028), EG (7014), FASVYN (7021), KM4OHG (7013), LUs 4ZL (7011), ZYD (7002), VPAS (7008), YU1ANQ (7017), ZS3E (7030) and 3A3TU (7026) ....... KG6QY (70d1) and KW6Bl (7030) interested W1QRP while W1DPTQ scored with F2CLG, VP3 3WO and 7NM ....... W8C7VZ raised the VPS and CMAJF previously mentioned, as well as CR7LU (7002) and 2Z9I (7018) ....... W4LMC captured KH6IJ and a CO2 while in hot pursuit of KJ6AX (7041) ....... F2SCR (7008), IT1AGA (7002) and KTIUX (7021) came back to W4AE. A reminder — 11 and 1T1, same country ....... QSLs from K1A4E, WP6AF (7019) and YU1AQR (7004). Expectedly by W7CFO, Dick at W4UJJ tells us of luck with DUS6, F2AYN, K86AY, KG6PAA, K1A7MX, LU5Z0, TI 2DN 20Z 2RC 6EL, VP9A 01A 0GM (Norfolk island), VP9HE, XE1DA, ZB9I and ZD2AB ....... Mentioned as likely candidates by SCDXcn's Bulletin are CR4AG (7040), LZ1KAB (7015), VSU5N (7010-7025), YUSAKL (7020), ZC5VS (7050), ZD8A (7006) and one GY2A (7015) who says he's on Lezique island ....... West Gulf DX Club's DX Bulletin speaks of 7RAO (7013), DUSYV (7022) and F08AI (7022).

Still for the most part a daylight DX band, twenty c.w. was put to work by W8HEV for quite a collection: CN8a BI at 1608 EST, FB (1537), CQBYX (4908), CR7a LU (1416), JZ (1504), C1TBO (1119), EAA9BB (1639), E12G (1501), F2SCR (1506), FF5A8 (1614), FK5SBC (1121), FPASQ (1101), G2DUIB (1258), HIC1A (1225), H13s FL (1640), L (1641), IS1ZK (1303), ITY1 (1400), KadalA (1168), MP22U (1443), MP4ABB (1097), O4Aa AS (1042), C (9812), O2E13a HS (9845), RN (9800), P2ZAK (0837), ST2GDL (1537), SU1FX (0813), SV6WB (1031), TASSA (1017), TFSB (1027), VP3 IA (1220), SAK (1922), SAQ (2002), V2GIA (1960), V3R1 (1938), CV15 (1910), YU2S BU (0902), DM (0920), YV5D6E (0816), ZB1KQ (1437), 5As 1TC (1400), 3ZT (1025), 6US AX (0910) and BS (0902) ....... W6HUS's latest, frequency-wise: CR6AQ (0908), FP4H (0902), FP3BH (0905), FYTB (0905), H29LA (0898), KZ2L (1054), MP4ABB (048), OY7Z (072), TASSA (013), VP3 2EO (088), 3AP (008), 8AR (058), 8AT (022), 8A3 (060), ZD2DCP (008), ZS9T (005), 4XBE (098), ZA9G (012) and 4X8 (008) ....... W2YO dug up MP2AF on 14,000 kc. and W1BTQ scored with an F4, 819, C8NS, VP6EB and YUI1E ....... W6DLZ found an FQ8, OX3G (040) and YU3BC (014) to his liking ....... W44DO (025) and ZB1HU (010) worked W8YGR. Jack still battles a Toledo power leak as well as droopy band conditions ....... W9MOH climbed up to 92 worked after speaking CONCZ, C1TBO, FASSH, an FQS, KG6ABN, CQ6LL, SP2KGA, SVFWY, an S1L, YU1E1 and Z96Qs (096) of 98Is [In push-pull, Bess—Jenifer] Ray likes photos of DX-stations-with-operators — we run all the good ones we can get our claws on, and the rarer, the better — W2LIFZ dropped in for a chat, and KB4AY while W4TO kept busy with KAs 9AA, 9JL, KJ6AX, MP4ABB, OD5AD, ST2RA, VE1KM, ZC4s RS XP, 4X4s DF and FG ....... W6KCU/UCQ2B, West Gulf DX DXers, hereupon volunteer C3BF (071) at 2027 CST, ET3Q (042) at 1000, FQ8AR (005) 1440, GC2CNC (060) 0800, J4A IAQ (099) 1182, SAD (070) 2035, KASAF (055) 2021, MIB9J (028) 0600, P2Z1A (211) 1620, SP2KAC (045) 0830, ZQs JIN (046) 1340, 3K6F (079) 1400, 4HFIP (054) 1347 and 4X4AD (071) 0830 in their DX Bulletin's slickness; SCDXcn's gang points out JZ4US (050) 1810 FST, OD5AB (060), P2ZAK (060) 1530, PJ2CH (025) 1800, VP8AR (020) 1820, ZC3AA and ZFSAY (025) 1700 120 ....... WEHIN1I sent word through ZS6s 1BW and DW to Ws 2GIC and 8UKS telling of his activity in Nepal ....... C6BAA will strive to represent Eastern island on 14 Mc. for a few days in late May according to C823DG. C823AG is the scheduled operator and QSLs should go to his Call Book address ....... W2PPP, who has been collecting his share of these for a while now, has a 100-watt 813 rig modulated by 80Is, HRO and SX-71 receivers. (Photo via W1FIH)

V59AW was responsible for filling in Sultanate of Oman spaces on many DXCC Countries Lists. The operator, G5G/U, uses a 100-watt 813 rig modulated by 80Is, HRO and SX-71 receivers. (Photo via W1FIH)

QST for
--- W3YDC writes of one FR3WI on Washington Island who puts out a wicked sig with 150 watts and a 3-element beam. FR3WI QSLs may go via K6LYP. If you employ fast push-to-talk you may get a few words in edgewise during the QSOs—callings that now characterize twenty phone. W9BDW works twenty for C6BA, AI, AT, KG4AO (14,810) at 1725 CST, K7L1U (320) 1243, KA1AC (270) 1700, VI2AA (135) 1735, VQ4AA and Z1D4HR. Z1D4HR (155) is also landed at WD7LQ in addition to M2MAA (270) and YV88B (315). Ham nominals YN4CB as a sure bet for fast Nicolean QSOs.

--- MP4MKC (180) worked W6FFW while W4ZEP came through for CP1AE, A6CZ, CTSAN (115), V41AB, HAG 3YV, VQ1XX 1P and ubiquitous Z74IK. In a "Small amount of operating time," W5HEY runs down stuff like (times EST) C8N8 BL (1603), F8 (1748), FT (1922), MMG (1751), EL9A (1705), H1I6FIL (0904), PABG (1228), KE (1750), O4AAS (1622), T200B (1710), VPA 4TO (1805), 5AK (1291), 51D (1814), VQ2D (1420) and Y282A (1811). The DX Bulletin of the WQDGC boys specifics 20-meter phones (times CST) CR7AD (158) 1500, E4A6R (130) 1520, GD2FZ (161) 0812, LX1DX (120) 1055, Q5s SCF (125) 1305, ES2B (138) 1350, SFO (140) 1315, SCZ (133) 1355, DZ (175) 1345, ST2NW (191) 1440, SUSEB (125) 0740, TA3AA (311) 0730, VQ5 ZDC (121) 1430 and SAD (130).

The coming of element weather to northern latitudes coincided with a lack of improvement in conditions on ten and Afternoon, W6ZL stuck by 21 Mc, and now has 34 countries on the band. CE43 AGA 6AB, KB6AY, K0EHE, KF4u KD QR, W6DFY/KP4, KV4AQ, KZ2u IL W2A, LIA HF 5M, P11CX 9AX, QA4N, FY 20E 4AJ 4IE, VP4s 4LZ TN, XE1IP, N1AAA, YV6DE, ZK2AA and Z83A provided recent QSOs for Miles. By the time these words get around W6ZL will be scouting for 15-meter phone calls on phone. W7PFA would like to see more "What" dope on 10 meters — so would we! "Contrary to popular opinion, Ten is not quite dead and many DX stations have been either heard or worked [here] in the last month," writes Fred. W9TPA has evidence, too — recent chats with CEs 4BX 8AD, H3F3L, K65MG, Lu 4DZI 8D1DI and TI3LA. Twenty-eight-Mc. "Phone heard but not raised: L77FU, OA4N, PY2AS, ZL1A GW (28340) and MQ. — Back on 21-Mc. e.w. W7WCZ joyfully fangled with CP1HH, F84AQ, H1I6FIL/Tr1ete, Q580Q and VP4KLZ. Next month we'll likely be taking up the subject of 15-meter phone WACs — good luck on yours!

Where:

With grousing about low DX QSL returns reaching another peak, it's again seems timely to point up an unfortunate fact: Many an overseas radio society will handle cards for its members only. QSLs for other stations in its country will be pigeonholed, or returned, or even possibly destroyed. In view of the existence of such policy it behooves all DXers to QSL via bureau only when instructed to do so by the DX stations worked. When in doubt, QSL direct. The incoming-QSL bureau facilities of ARL! on the other hand, are available to any U.S.A.—Canada amateur.

E4A9Y, Box 215, Melilla, Spanish Morocco EL2P, c/o PAA, Roberta Field, Liberia EH2R, Henry J. Greaves, USPHS, Box 34, Harbel, Liberia F5BB, QSL via REE FO8AI, QSL via WT7PK PR72A, QSL via REI JAJ1WA, Box 87, Niigata, Japan JAGAS Box P, Kumamoto, Yubari, Japan KA4C, QSL via WAREL KG6ABN, Jake Leons, USCG Air Det., Navy 943, Box 28, FPO, San Francisco, California.

KO6AEP, O. S. Jackson, Jr., ex-W4DCE, Box 145, Agana, Guam LU2Z0, QSL via RCA N1BNMQL, QSL to C. Cooke, Travel Agent, Nairobi, Kenya Colony Q4SH, Gerard Capelle, c/o Uelcacho, Leopoldville, Belgian Congo S11FX, QSL via ASQIL S12G, QSL via REE V2KQO, P. O. Box 213, Basesterre, St. Kitts, B.W.I. V7PNS, P. O. Box 48, Nassau, Bahamas, B.W.I. VQ5MM, QSL via RSGB X2ZOM, QSL via RSGB, C. B. Busa Y20DM, Box 216, Limassol, Cyprus ex-ZM4AX, QSL to H. Smith, Picture Recorders, 1049 N. Kenmore, Hollywood 26, Calif.


The foregoing came through the good offices of WIVO, W2s AOS/KG6 LYO, W3s JSH TM, W4s KFO TO, W5s HEV UKS, W8s CPT MQX, W9BDX, CNBCS, the WQDXC DX Bulletin and Gary Rinton. If you encounter a DX-station address previously unpublished, ship same along and do someone a good turn. Okay?

Tidbits:

Hereabouts — Those who receive QSLs from HHs 2P and 89, in the future may owe W2DEO a heavy vote of thanks. Urh arranged to obtain QSL stocks for these stations. W2DEC has proof positive that EI8J, H61TC, HK1JO, H1RKS, P23a AA AF, KA9AA and TA3AA do QSL. W2BZM wants to know if anyone can give him tracers on Y2BM (‘40) and MD2PM (‘51). W61VXK and E9AQC QSLs continue to elude W6BDZ. Any help? Y6EASV is pretty good DX. He’s located at Kapuskasing, Ontario, roughly 700 miles north of Detroit. Dudley, with a deepanging between 50-foot poles, is after Africa for WAC and Nevada for WAS. W1JDN and W601YA/T0861 witnesses that security regulations are quite strict in Lebanon. John was out enjoying the fun in the ARL! DX Test and he further advises that QSLs will reach him sooner if sent to his home address.

--- When Aspen Productions of Hollywood recently journeyed to Siam to make "Return to Paradise," the amateur radio went along. Gary Cooper helped movie sound engineer Harry Smith, ex-W6HEE, (right) make numerous contacts on 14-Mc. "Phone while using a Viking-I rig under the call sign ZM6AX. For commercial purposes he calls ASP-1 and ASP-2 were used in communication between on-location units separated by rugged volcanic terrain. Well-known ZM6AA was of great assistance in facilitating installation and W6AM helped keep the folks in touch with home. An interesting sidelight was the fact that another renovating movie party, on location in Fiji for a Burt Lancaster film, regularly tuned in on "Paradise" doings via short-wave.

--- W1WBR has a rare-DX pal for company while attending artillery school at Fort Sill, Okla. He’s Capt. Kambai Chotikul, H1WFR, of the Royal Thai Army. April’s National Geographic carries "Three Months on an Arctic Ice Island," an interesting account of "L’84" doings concomitant with the ham activities of the KF3AA gang. Astra — MP4BAU lately unleashed a large charge of QSLs U.S.A.-ward, some via OK1MB and others via bureau. Adi told OK1MB that all W5s are QSLd up to date. This pitch via W3JSH, who is changing QTH to White Plains, N. Y., along with OM W8KWA. That’s where Dottie used to operate W2MYI, you know.

May 1953
Fred of K99AA wishes to set a few facts straight for the record. JARL handles QSLs for Japanese nationals (JAs) only and FEARL does the job for Japan-stationed U.S. personnel. From the W/K standpoint, postage to FEARL via AFO is the same as the U.S. and Possessions rate while mailers to JARL must pay foreign fare. There are no JAs of JARL now operating — JAB (two Jims) is still occupied territory. KABJY does a solo job in keeping two on the amateur radio map. — NE1NMC (W6NMC) will tackle the QSL backlog for his Nepal operations up reaching Nairobi. W1BDI 2GIC SUNKS and VSICZ joined in feeding us NE1NMC information. — Ted Gull, late of United Nations communications, writes: "Alas, 4UJ is extinct, as few of the R/Os in Kashmir are interested in hamming." Ted left the UN for a job back in England and these still in need of cards from 4UJ should write the "Where" address. Send along full QSO data, too — Ted checks his logs very carefully.

Africa — The new EL2R recently stocked up with 500 blank QSLs and has an ART-13 and BC 348 combo perking. Henry is a State side neighbor of WSTM and will remain in Liberia until August. He prefers twenty meters. — In Tripoli, S111Z tells us of the activities of club station S111Z. The boys — S137R S R Y and Z — keep things hot nightly on 14-M. phone and c.w. That's early afternoon our time. — The first Canary Islander to grab DXCC, says W1PWO, is well-known EABBC. — CN3EG (W1PWK) laments that regulations permit no 160-meter opera in Morocco. He otherwise would have taken a whack at the transatlantic tests of last season. "When 10 meters opens for short skip (in North Africa) it is FF8, EL, FG8, FA8, 3V6, ZD1, 2D2, ZD4, etc., instead of W2, W3, W4 and W8 as it is back in Massachusetts," Steve's nearest TVI source is hundreds of miles away and that could be one of the reasons why he likes it over there. "Oceania — Talk about the fielder finger of fate — KB6AY, who would like nothing better than to be rare DX on 3.5 Mc, finds himself a few degrees longitude "out of bounds" for such activity. FCC rules and regs put 170° west longitude as the farthest west that 80 meters may be used. — W2AOQ/KG6 effectively competes with Guam's local QRO gang although he uses only 75 watts input. "Conditions have been very poor," writes Charles. "Europe — After knocking ZB2I off for a new country, CN3EG packed up and went over to visit him. Steve found that ZB2G A and I are the only Gibraltar stations active. ZB2A is a club-like deal operated by military personnel while ZB2I is the first and only civilian to nail down a Gibraltar ticket. ZB2I QSLs 100 per cent and believes his 80-meter contact with W2QII to be the first 3.5-Mc. ZB2/W QSO. Ed runs 25 watts at an 8070 on phone and c.w. and likes all bands from 80 through 10 meters. He uses double antennae and his receiver is an HRO. — Tough luck at G3CFK. Peter lost his entire QSL collection in the recent European floods and would like stations who have worked G3CFK to ship him duplicate replacement cards. — Except for four U.S.S.R. countries, G2M1 needs only a card from FT2G to have all countries worked confirmed. Art sees QSLs for three-letter Gs once in a while — no such animals. — Radio Club Amateur of Ravenna, Italy, offers a certificate (WAIP) to any station submitting QSLs for the working of sixty (60) or more Italian provinces. Cheer up, sheepskin-hounds — Italian stations must work 76. Interested parties write the club for details at P.O. Box 172, Ravenna — FTBB (32A2Q) received orders for his return to the States and may be on the air soon from Fort Bragg, N. C. Jim would like to operate from Andorra while stationed on the Continent but there is at present a taboo on ham operations by nonresidents. — In July, DL6SS will embark on a small DXpedition to Liechtenstein. Klaus intends to operate on 16 Mc. from 2100 to 0100 GCT after he gets fired up. — W1WTO notes that SM3TQ packed up another DXCC, this time with the call SMT7Q. South America — "I have returned from several months in Chile and find a copy of a letter to you from H2C2R relative to a stack of QSLs he forwarded to me covering alleged e.w. QSOs with H2C2T, my old call. Unless this call has been reassigned the guy is a pirate, as I went off the air (as H2C2T) several years ago." Thus writes Steve Stevenson, W6HR. Do we hear hysterical cackles from the stope who pulled this stunt? — W9AND still handles QSL matters for F4TYB and desires the gang reminded that stamped, self-addressed envelopes are required. [Boss, who ever heard of an envelope addressing itself? — James. Quiet, boy, VP8AS's long-awaited paddleboards are beginning to get around in force; W1ILG got his. — We've heard that the British closed down LU4ZI. What price exclusive country-status?"

One of the first Japanese-national amateur stations to hit the air legally postwar was Tokyo's JALAH. Roy likes 14-Mc. work and runs 200 watts to a two-stage rig. Double antennae and a 12-tube homemade superhet are used. (Photo via W6BES and W3VES/1)

Well, somebody finally did it. W7ITN's new DXCC certificate is the first such earned by an Idaho station. DXCC has Worked All States!
May! Wonderful feeling, isn't it?

Like the crocuses, daffodils and violets that spring up seemingly from nowhere, signals from far beyond the winter range appear to cheer the v.h.f. man at this season. New calls, and old familiar ones, too, can be counted on to show green tips above the background noise, once the warmth of spring has shone down on them for a few days.

Big beams, battered by winter's storms, are put back in shape, and let v.h.f. DX of any sort show up and we'll hear activity in a volume that has not been in evidence for months. Yes, this is the season when the hardy annuals blossom forth on the v.h.f. bands. We're making progress in promoting greater all-year use of the frequencies above 50 Mc., but there are still many among us who, for one reason or another, lay low in winter. They're not far away, however, and the smell of May in the air brings them back in droves.

If you've been on the verge of a venture into the world above 50 Mc., now's the time to be about it. Perhaps we'll be pardoned, then, if we offer a word of familiar advice to the v.h.f. newcomer, as to what to expect of this strange and wonderful world he's about to invade. What does it take to have fun on 50 Mc. and higher bands? Wherein do they differ from lower frequencies?

Perhaps the most important difference is that good receivers and high-gain antenna systems are almost a must. You can work 80, 40 or 20 after a fashion with a receiver that's only fair, and an antenna that is makeshift in character, and still have fun. It's nice to have something better, but you can get along. So, often we find the budding v.h.f. enthusiast making his first pass at 6 or 2 with a mediocre receiver, a 10-meter beam or an 80-meter Zepp. He'll hear a few signals when things are red hot, so he assumes that things are working, but the results he obtains are not consistent enough to hold his interest for long.

After a few weeks you'll hear him at the local radio club, or back on a lower ham band, saying, "Well, I worked some guys on 6 (or 2) but you can't hear anything there unless the band is open — and it's open too seldom for me. That v.h.f. stuff is for somebody else!"

Well, how does he know, when he's never really tried it? Chances are that his chromium-plated communications marvel has a noise figure 15 db. or more above that of even a simple converter he could have built for himself. His makeshift antenna is sure to be robbing him of at least that much more in the way of received-signal strength, compared to what he would have had if he'd taken the trouble to put up a good beam for the band he was nibbling at.

Every year about this time, v.h.f. makes — and loses — converts who fail to enjoy the game because they don't play it hard enough. So, if you're taking your first dip in the v.h.f. pool this spring, be sure that you wade in well equipped. Start out with a good converter (you may have to build it yourself), and a real beam antenna for the band in question, and we can almost guarantee that you'll like what you find. The transmitter can be of moderate power; you're not going to have to beat down a thousand other fellows on the same frequency, but you do have to be able to hear the stations that can hear you. Good gear and a little patience in learning the ropes will pay off in countless hours of fun like you've never had before. We'll be seeing you!

420-Mc. Record Moves to Europe

For years now we've been shipping away at that 262-mile 420-Mc. record held since 1949 by W6VIX and W6ZRN, who set the mark by using portable gear at two California mountain locations. When that job was done it looked worse than formidable to 420-Mc. workers who were confined to home locations. It seemed just about impossible that two-way work between home stations could even approach this distance, in view of the trouble fellows were having in covering radius of 15 or 20 miles.

Then we began to build crystal-controlled transmitters,
Antenna systems at ON4UV, Belgian 420-Mc. record holder, includes a 4-over-4 for 144-Mc., "top", a 32-element system for 435, consisting of eight 4-element bays, and a 14-Mc. rotatable dipole. The square framework formerly supported a 3-element 10-meter job.

and the converter-and-communications-receiver approach became practical for home-station use. Soon, just as on each lower v.h.f. band before it, we found that 420-Mc. signals were audible at points far beyond the horizon when conditions were right. Despite relatively insensitive receivers, lower efficiency in the transmitters and a limitation of 50 watts peak antenna power, we found that, on occasion, 420-Mc. signals ran ahead of those on 144 Mc. on paths of 200 miles or more.

From here on it was mostly a matter of getting two well-equipped stations on the air at the right times in the right places to extend the record. Again and again, the record was equaled in two-way work, but not surpassed, or crossband (but not two-way) contacts were made beyond the record distance. Notable examples of this were 144-422 QSOs between W88BF and W2QED, and FSBG and FABH, the latter a distance of nearly 300 miles across the Mediterranean. Your conductor both heard and was heard by stations in the Washington, D. C. area, but could pull off no two-way contact for a record.

Meanwhile, interest and activity were running high in Europe. With only 146 and 420 Mc. set aside for amateur use between 28.7 and 1200 Mc., the v.h.f. men of Europe outstripped us in 420-Mc. progress. Crystal-controlled transmitters and superhet receivers of superior performance were put into service in considerable numbers in Britain and on the Continent. The results have been reported in QST regularly; almost at once, home-station 420-Mc. coverage of Europe exceeded ours, and it seemed only a question of time before the record would move across the Atlantic.

This has now happened. On March 3rd, ON4UV, Fayt-le-Maor, Belgium, worked GW2ADZ, Italy, and then worked the same station out of Mymensingh, Pakistan, a distance of approximately 2,400 miles. Two contacts were made over this path, at 2300 and 2351 GMT, and between these times, ON4UV also worked G3BKQ, 270 miles, G4AP, Swindon, G2WJ, Dumo (who was running 3 watts), G4XV, Cambridge, G3HAX, Birmingham, and PA3SWR. The signals over the record distances were 89 each way, so you see the possibilities when 420 is open!

The rig at ON4UV uses a pair of 8012s in a push-pull tripler, following its regular 2-meter job, and these drove the European equivalent of the 9003 on 435 Mc., delivering about 15 watts to a 32-element array. The receiver has 644 and SC802 t.f. stages ahead of a crystal mixer, the output of which works into a 3-stage 30-Mc. f.f. Following this is an SX-28 with panadapter plug-in. ON4UV has four countries worked two-way on 435 Mc., contacts including FS0L, F3GH, F8JR, F3LQ, G5DIV (worked in 1951), FABN, F8E1PL, and the DX mentioned above. As yet, he has worked no stations in his own country, other than crossband!

GW2ADZ runs 30 watts input to a CV127 doubler, feeding a 32-element array. The receiver has a crystal mixer, followed by an EF54 t.f. amplifier stage on 8 Mc., working into an S-640 communications receiver. Exact geographical

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QST for
locations have not been received from both ends as yet, but the distance appears to be at least 350 miles. It’s a real mark for us to shoot at, in any event! 

Late news: Word from GW2ADZ reports another QSO on March 22nd, again with 89 signals!

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

Transistor-to-transistor QSOs on 50 Mc. W2IDZ, Danville, N. J., and W2VCM, Morris Plains, have built transistor rigs and made two-way contact on 6 over a 4-mile path with less than 100 milliwatts input. Ed has also worked W2MEU, at Washington Rock State Park, a distance of 18 miles. The rigs use a single-point-contact transistor as an overtone oscillator, with either 25- or 8-Mc. crystals. The transistors are not special production for v.h.f. At a power input of 70 milliwatts, the signal between W2VCM and W2IDZ runs about 89 on cw. Ed has also frequency-modulated his to provide narrow-band fm. as well as cw. So far, no TVI in Channel 2 has been reported with these superpower jobs!

W2IDZ reports good prospects of increased 6-meter activity in Northern New Jersey, with the Lakeland Radio Club in the process of building twenty 10-watt rigs for c.w. use. The nightly workouts on 6 begin around 9 P.M., instead of 10, as reported in our net tabulations.

Add 50-Mc. DX prospects, K2GMS, Diablo Heights, Canal Zone, has 50 watts to an 807 on 6. Various long-wire antennas are in use at present, but he expects to have a 50-Mc. array up before long.

Although the prospects of auroral activity, a series of openings in February and March caught most of the old aurora hands by surprise. March 8th and 9th were particularly good, with both 6 and 2 being open for the usual DX of 100 to 700 miles. An unusual feature of the 2-meter session was the logging of a W6 signal by three different W2s. All are good c.w. operators, so we accept their version of the call heard, and the method of signing. W2OFQ mentions that it sounded strange to him because the signal came through from the same direction, with the same signal level, and at the same time as W8s and W9s. He suspects that somebody out W8 or W9 way was pulling eastern legs. Any more information on this one? The frequency was 144.45 Mc.

W9NJS, Kentland, Ind., was hearing W8EMS, numerous W9s, W8SRW, W3PMQ, W3LZD, V8EAI, W2ORI, and W2NLY on this one. Fuzzy TV reception was his tip-off.

Incidentally, we’d like to apologize to W9NJS for slighting him in the report on the results of the V.I.L.F. SS recently. We credited W2NLY and V8EAI with the best DX reported, when actually it appears that W9NJS hit the jackpot in working W8EMS during the contest. This is a distance of some 376 miles, and by far the best 2-meter DX reported for the contest period.

W9KLR, Rensselaer, and W9ORZ at Anderson, Ind., report solid communication between their two locations on schedule, despite only 15 watts at W9KLR. Bill has also worked W9LVA, Ft. Thomas, Ky., 100 miles, during the winter. He says that barometric pressure readings provide a good indication of favorable propagation, winter and summer, with the band being worth watching whenever anything higher than 30.0 is recorded. Band conditions have been invariably poor in periods of 29.8 or lower.

Note to 420-Mc. TV addicts: W2UTH and W4Ms are usually on 20-meter phone on Saturday mornings, looking for other ham TV enthusiasts.

Activity on 220 Mc. is increasing in VE3-land. VE3BGQ is on with an 824A and a 1057 converter. He’ll be in business throughout the summer and looking for DX chances as well as local contacts.

Chicago is also in line for increased 220-Mc. interest. W9VY, Hammond, Ind., says that several new rigs are on the air, and contacts are now possible nightly, both two-way on 220, and crossband to 144. W9s REN ADO NMS OJV QPR and OVL are on regularly, with things getting started between 2000 and 2100 CST.

Spring came early for the v.h.f. and u.h.f. fraternity this year. The European record-breaking work on 420 Mc. reported elsewhere came well ahead of the usual period for tropospheric openings of any magnitude. And the early-morning scenes kept by your conductor and W2QED came to life on March 14th. After working daily through the winter with barely-audible 2-meter signals over this 210-mile path, we were pleased and surprised to find 95 signals on 144 Mc. at 0730 on the 14th. Changing to 425 Mc., W2QED came in equally well on the higher band. The signal remained in until 0845, when a change back to 144 Mc. was necessary. The first success on 420 over this circuit last year didn’t come along until well into June.

Tropospheric openings have been reported by the 2-meter gang for several dates during March, and everyone agrees that conditions at these times have been well ahead of the best usually encountered before May or June. All hands hope that is a sign of good things to come later on in the season.

**Club Projects Use V.H.F. Bands**

*Wabash Valley AREC on 50 Mc.*

The appearance of the hand-carried 50-Mc. transmitter-receiver in QST for May, 1951, set off a chain reaction in the ranks of the Wabash Valley Amateur Radio Association of Terre Haute, Indiana, and vicinity. This group, always civic-minded, organized a project to build and operate 10 small battery-operated 6-meter rigs shown in the accompanying photograph.

They served their purpose well, but mobile gear of greater power and range was also needed. This problem was solved when W92HIL loaned 14 mobile units that could be converted readily to 50-Mc. operation. W9HIS writes that these were obtained by each member furnishing the money for one, the club having insufficient cash resources to purchase the equipment outright. In the event that any holder decides to relinquish a unit it is made available to the next man on the waiting list, the original deposit being returned, less charges based on the condition of the gear turned in.

Both transmitters and receivers are crystal-controlled on 50.5 Mc.

A 50-watt portable station is kept in daily use, and antennas have been installed at Red Cross and Civil Defense headquarters. W92ETS has furnished a 250-watt main station equipped with a 110-foot tower, providing coverage of 45 to 50 miles to the mobiles with ease. The car installations run up to 37 watts input. A 1.5-kw. gas-engine generator is a recent club purchase. Shown at the right of the photo-

May 1953
through with flying colors. In most cases, the rig remains the property of the builder, but is loaned to the local organization for use. In this way several towns have been sold on the idea and are now in the process of obtaining equipment for at least control-station service.

The TCRA gang have always been partial to the 2-meter band for local emergency planning. Recently, they demonstrated that the gear can be used successfully on what amounts to a statewide basis, delivering solid communication over circuits where 75-meter mobiles have tried and failed.

Last fall, an automotive group known as the Road Knights of New Jersey sponsored a reliability run on a 150-mile course extending from Plainfield, New Jersey, to Long Branch, New Jersey and back. Mobiles operating on 75, 10 and 2 meters were deployed at check points along the route to handle information on progress of the run. This set-up was too complex to be satisfactory, particularly as to interference on the 75-meter circuits, but results were such that the Road Knights were willing to try again.

The TCRA group was called in again for the Knights’ first spring event, March 15th, and this time the job was done entirely on 144 Mc. The course of the run and the check points along it were chosen by two organizations working together, taking advantage of topographical features that would suit the needs of the 2-meter operators. The runs are based on the strict observance of all traffic laws, so the course can be laid through any territory.

This one started at Watchung Lake, near Plainfield, and ran through Old Bridge and Englishtown to Toms River, returning via Freehold and Old Bridge to the starting point. Hills surrounded the low starting point, so a high spot near by was selected as the control point, information being relayed from the actual starting line. At Toms River, the turn-around was also low, and in the center of the town, so a higher quieter spot close by was used as a relay point. Roving units were deployed along the route, and portable stations were set up at the check points at Old Bridge, Freehold and Englishtown. TCRA stations were used at all points except the two ends, 502C being installed here in case more power was needed. All locations were checked out thoroughly well in advance of the date set for the actual event.

All bands were on deck by 7:30 A.M. on the big day, and the run started on schedule at 9. Operation was continuous until 4 P.M., and all necessary information in connection with the run was handled without a hitch. The regular net frequency, 146.54 Mc, was used, and the band was completely clear throughout the day. The boys feel that similar work could be carried out on 50 Mc., or even possibly selected spots in the 10-meter band, but the freedom from interference on the 2-meter channel was in marked contrast to the tangled mess that prevails most invariably when this sort of work is attempted on 75.

TCRA members participating in the event were W2AC LI KOG OM AJO QR ACE IXS FCO TWO BEF IEM LEO MEK and HNY. Matty, W2AX, that phony and plans for the club gear have been supplied to more than 100 other groups, and that occasional requests are still being received. TCRA has done this gladly, but they ask again that only groups who actually intend to make a project of the construction of the gear send for the material, and that postage be included with the request.

graph, it provides for emergency operation of the 50-watt rig, and gets a workout each Field Day. Crystals for the receivers were purchased on frequency. Those used in the transmitters were etched to the required channel by WBZHL and WSANH. Installation of the rigs was supervised by W2EQZ, assisted by W2HO. All the gear is tested frequently in simulated emergencies, and it has been pressed into service for such diverse community projects as the Red Cross fund drive, the local Soap Box Derby, and long-distance swimming meets. It acquitted itself well in one actual emergency, a tornado that struck the town of Shelburne, Indiana. The interference-free nature of 50-Mc. operation has been ideal for such work.

TCRA Employs 2-Meter Rigs for Road Events

For more than two years, the Tri-County Radio Association of Plainfield, N. J., has been building and operating 2-meter gear designed especially for emergency use. Described by W2NYT on QST for October, 1951, the TCRA rig consists of interchangeable subassemblies and can be operated from either 115-volt a.c. or 6-volt d.c. supplies. More than 50 complete stations have now been built, and their value has been demonstrated again and again.

Some of them have been integrated into the civil defense organizations of several New Jersey towns served by TCRA. Their owners take part in frequent simulated incidents and drills of various kinds, and always come ready.

**Quoist Quiz**

In making plans for Field Day, A suggests that the club investigate the possibilities of a balloon-supported antenna for all bands. He has computed that the balloon he has in mind will support a 300-foot length of wire and says that the height should give them a terrific signal on all bands. B claims it isn’t worth a hoot and that it would only be a menace to aerial navigation. Who is right?

*Please turn to page 130 for the answer*
Results of the Novice Round-up—1953

For two weeks in January of 1953, the call of CQ NR was a door-opening phrase. With it, you called somebody and dozens came back! A glorious period in which ‘QRL?’ became the stock phrase accompanying it.” — WN3UJP.

If you were lucky enough to be participating in this second Novice Round-up, you probably will agree completely with the above words. The two-week period of January 10th through 25th brought out more Novice and non-Novice stations than did the initial event in 1952. One hundred Novices, and 18 other amateurs submitted their logs in the competition.

Let’s take a quick look at the objectives of this contest. What’s it for? It’s to help the newcomer build up his operating skill, as well as his code speed. Some comments from participants really point this up! “The NR is just what I needed as an incentive to gain more operating experience.” — WN8UTR. “Lots of fun, makes for good operators among the Novices.” — W9QLW/J. “On the whole, I must say that the contest was exciting, and if it’s only a fraction of the excitement of the SS and DX Competitions we’ll be going all out for these contests when we get our General Class license!” — WN2OILH.

“I was pleasantly surprised and impressed with the clean signals and snappy operating of the majority; that 50 kc. on eighties sounded like the low end of twenty during the DX test!” — W4BZE.

Don’t think that the only winners are the top scorers. The Round-up was an opportunity to improve operating skill, meet new hams, learn of the League’s field organization, add to your states, etc. An especially eventful two weeks was had by KN2AZA/K2AZA. During this period, he worked his best DX (VE7), his first W7, 5 new states and received his Technician License — but best of all, he made a lot of new friends.

“Some of the WN competitors sounded like candidates for the ‘53 SS!” — W4KFC. If you’re one of the many excellent operators Vic is referring to, maybe you can find a clue to improving your operating percentages by glancing at the following figures on the top five Novice scores: 6004, 5891, 3900, 3572 and 3562. They all deserve merit for their outstanding showing in the competition. Offhand, which of those scores do you think reflects the most contacts per hour of operating time? If scored in order on this basis, the second total would be top man. Which reflects the most sections worked per hour? Here again, the second total leads. Don’t be fooled by figures for the sectional basis is the best yardstick to measure yourself against. How did you do in comparison to others in your section?

With 48 sections represented, the state of Illinois can take pride in the achievements of WN9- UVM and WN9TGY. Third and fifth places belong to Western New York, with the Arizona Section in fourth place, thanks to the nice work of W7RUK. The majority of the Novice contestants claimed credit for code proficiency certifications of 15 w.p.m., with 13 entrants certified at 20 w.p.m. or above. Newcomers? Not by a long way!


With his fine flair for words, WN3UJP perhaps expresses all of the tribute paid to a non-Novice participant by many of the newer boys. “Tribute must be paid to an unsflagging, hard-working ham who helped hundreds of Novices acquire valuable contest points. He helped keep the frequency clear for the Novices and made the way a bit easier for many of the boys. Hats off to W4KFC!”

SCORES

Scores are grouped by Divisions and Sections. The operator of the station first-listed in each section is award winner for that section. Example of listings: W3UUA 676-83-12-15, or, final score 570, number of states 35, number of sections 12, total operating time 15 hours.

ATLANTIC DIVISION

Eastern Pennsylvania
WN3UA, . . . . . . 576- 33-12-15
WN3TXO, . . . . . . 160- 15- 5- 12
KN2AZA/K2AZA, 11- 1- 1- 1
Md.-Del.-D. C.
WN3VBO, . . . . . . 360- 25- 8-12
WN3USB, . . . . . . 161- 13- 7- 4
WN3VAR, . . . . . . 40- 8- 5- 2
W4BZG, . . . . . . 26- 5- 5- 2
Western New York
WN2AZA, . . . . . . 3000-110-30-30
WN2AKS, . . . . . . 3539-228-29-26
KN2BR, . . . . . . 2600-146-35-38
WN2OLIH, . . . . 429- 29-11-32
WN2CAP, . . . . 42- 4- 3- 3
Western Pennsylvania
WN3UFW, . . . . . . 1794- 78-32-40
WN3UTR, . . . . . . 1650- 54-20-34
WN3UJP, . . . . . . 180- 15- 6-30
WN3TAS, . . . . . . 168- 12- 6- 4
CENTRAL DIVISION

Illinois
WN9UVM, . . . . . . 6094-138-38-30
WN9PGY, . . . . . . 6781-123-45-55
WN9WBI, . . . . . . 3335-160-25-24
WN9VBW, . . . . . . 1652- 65-24-28
WN9WBL, . . . . . . 1064- 41-19-17
WN9GWZ, . . . . . . 550- 20-14- 8
WN9SDD, . . . . . . 54- 8- 4- 6

(Continued on page 110)
TIN-CAN METER SHIELD

The tin cans that many types of fish, fruit and vegetables are packed in may be reworked for use as meter shields. Fig. 1 shows how a panel-mounted meter may be encased in a pair of these containers. Minimum can diameter should allow using the meter mounting bolts to hold the assembly in place. The top of the panel-mounted member must be cut out to clear the meter case and its length should be equal to the depth of the meter. The cap section is cut from a second can, the same size as the first. This cover should have a slot or hole to pass the meter leads and should be equipped with tabs that will force-fit over the front section when the two units are fitted together. Solder taken easily to the tin and may be used to complete the bonding between sections. — John F. Shumaker, Jr., W4UAB

MOBILE-ANTENNA MOUNTING HINTS

Many of the new cars are equipped with a pair of back-up lights. If one of the lamp assemblies is removed, it usually provides an opening that is ideally suited and located for the mounting of a whip antenna. The light may be returned to its proper place when the car is either sold or traded in and, as a result, there is no unsightly hole remaining to decrease the resale value of the car. — Loren R. Norberg, W9PYG

At least one of the late Pontiac models has an Indian head emblem fastened to each of the rear fenders. Remove one of the emblems and you will find a hole that is just right for mounting the mobile antenna. You may even find that the local radio supply house has a base for the radiator that can be fastened to the fender by the three screws which originally held the emblem in place. — Robert M. Resconsin, W1TRF

FINGERNAIL POLISH AS A CONSTRUCTIONAL AID

There are several ways in which ordinary clear fingernail polish can be used to advantage during your next building project. It can be used to hold a nut in place on the underside of a chassis or on an interior surface of a compartment while a component, cover plate, etc., is being mounted, thus leaving both hands free for the handling of parts and tools. A few dabs of the polish will also serve as a substitute for lacquering when a small within-the-chassis cable is made up and it can also be used to anchor a wire or small cable within a unit. Be sure to apply a small quantity of polish to both the insulation and the metal when one or more wires are to be bonded to the chassis. — David G. Kocher, W9PNX

RELAY-TYPE CRYSTAL-SWITCHING CIRCUIT

A remotely-controlled crystal-switching circuit that is especially well suited for trunk-mounted mobile installations is shown in Fig. 2. The system employs a pair of 6-volt d.p.d.t. relays, 1 crystal positions and a 2-pole 4-position rotary switch. In operation, a particular crystal is automatically connected back to the grid of the oscillator tube merely by proper positioning of the remotely-located selector switch. Of course, the relays are mounted in the oscillator compartment of the transmitter. The relays used in the original installation are C. P. Clare midgets that operate at a current drain of only 300 ma. at 6 volts. They were purchased from Relay Sales here in Chicago at a cost of approximately $1.50.

The frequency range covered by the four crystals should not exceed 100 kc. or so. An attempt to cover a wide band of frequencies will probably necessitate retuning of the transmitter and the antenna. — Gordon Lawder, W9PVD
Correspondence
From Members

The publishers of QST assume no responsibility for statements made herein by correspondents.

SINGLE OR DOUBLE?

161 Darlington Rd.
Syracuse, N. Y.

Editor, QST:

I was startled to learn from the January issue that there are only 237 hams operating on single sidestream in the U.S. Even though you have plugged the cause with page after monotonous page of explanatory and constructional articles and have even maintained a regular s.s.b. department in QST, you have enjoyed only 1/50 of 1% of the licensed amateurs in the tedious pursuit.

Most of us are hard-pressed to keep our "old-fashioned" 'phone rigs in proper operating condition and to find time to operate them without neglecting home, family, church and friends. I suspect that many of the fellows who built their own s.s.b. equipment put so many of their working hours into the project that their hobby should more correctly be termed "an obsession."

Not that I am opposed to progress in the art. But, I believe QST's valuable pages should more properly be devoted to the improvement of conventional 'phone transmitters, rigs that can be made more simple and effective. There is room for progress in that direction too.

Also, I am a democratic sort of fellow. If there is a dedicated group who feel that the electronic future of the world rests upon their humped shoulders, let them do what they wish with s.s.b. But please, QST, don't jam it down the throats of us ordinary citizens.

— W. T. Curtis, W2IWS

DEBT OF GRATITUDE

Hennessey, Okla.

Editor, QST:

In QST every month you list the passing of fellow amateurs. As I read the list, I note many are old-timers. My heart is saddened and memories of days gone by crowd my mind. Those old-timers are gone, but like footsteps upon the sands of time their works and marks of progress will remain as long as man. Do we amateurs who enjoy our hobby of today realize what a great debt of gratitude and respect we owe to those pioneers?

In the beginning those men started from scratch. They did not have the ARRL or a staff of engineers from which to obtain information and advice like we have today. With ingenuity, patience and love for their hobby, they pushed on and laid the foundation upon which all branches of electronics are built today.

We as a nation of people have not erased Memorial Day so we can pay honor and respect to our dead. Is there any reason why we cannot designate a certain time and a period of thirty seconds or longer and silence our keys on this same day in order that we may show our respect and gratitude to those men who have done so much for us?

Old-timers, living and dead, I salute you.

— W. P. Waggoner, W5UCT

FEED-BACK

29-23 212th Street
Bayville, L. I., N. Y.

Editor, QST:

On December 31st, 1952, I sent you a letter on docket 10073 and 10173. I wrote, "THE ABOLITION OF THE CLASS A LICENSE, usually obtained after a year's operation, was a serious slap in the face of the younger and future hams and discriminated against them." In March QST, while quoting my letter, you left out the word abolition and said, "The Class A License, usually obtained . . ." I wish to protest in the strongest possible manner to this twisting of words — the two sentences definitely are not of the same meaning and I demand that you print a correction in the next issue . . .

— Peter Rosenbaum, W6CAW

[Editor's Note: Our apologies for the editorial slip, which occurred in the course of selecting material from the hundreds of letters received on the subject.]

BUT WHAT TVII

3745 Veteran Ave.
Los Angeles 34, Calif.

Editor, QST:

We now have radio transmission and reception of hearing and seeing sensations — audio and video. There are three other sense impressions, which if proved to be vibrations, could be converted to radio waves and back again to their bodily vibrational equivalents. These are: olio — smell radio senseo — touch radio gusteoo (or palateo) — taste radio.

By these means, an odor, taste or touch microphone would pick up the various sensations to be transmitted, convert them, send them out, recover them and through an odor speaker, a tongue electrode or a touch elecrodal system, receive them again in the body of the person. This would mean tele-taste, tele-smell and tele-touch.

Here is a possible glimpse of radio transmission of the future.

— Martel I. Mickey, W6BUT

NET OPERATION

411 Woodward Bldg.
Birmingham, Ala.

Editor, QST:

The acknowledgment of a communications emergency provides for no loss in common courtesy, no usurping of frequencies other than by common consent of FCC section, and no failure invariably to listen before transmitting, emergency or not. These three things are collectively axiomatical. By intelligent criticism in retrospect it becomes possible to conduct ourselves better in the next emergency. Recently I heard an operator refuse to yield or share a frequency on the basis that his traffic was more important. He had landed on a channel long used by an established net. No opportunity was accorded to NCS to define the urgency of his traffic. Put the shoe on the other foot and no imagination is required to estimate the height of rightious indignation with the situation reversed. Furthermore, the easy, casual employment of the arresting phrase "Break! Break!" which brings all activity to a grinding stop (only perhaps to add the information that such and such in East Crabapple (Continued on page 144)
Operating News

F. E. HANDY, W1BDI, Communications Mgr.
PHILLIP SIMMONS, W3VES, Communications Asst.

Amateur Radioteletype and C.W. Operations.

C.W. net operators will be glad to know that amateur radioteletype societies have been studying some choices of preferred calling and working frequencies for voluntary RTTY practice. It was proposed by the League as mentioned in these columns last month, that there be a gentlemen's agreement and full coordination between RTTY and the published pattern of National Calling and Emergency Frequencies and net operations. Such can minimize QRM difficulty in both directions, and help RTTY fellows to locate and hook up with each other.

Midwest Clizs and Okla. AREC bulletins have noted difficulties in that A1 and RTTY are different languages. These bulletins point out that an operator can't tell offhand if it's traffic or rereading in progress, depoling no fast break method feasible for a courteous way to ask for cooperation. There are like gripes from Ohio and Indiana. NYS and other net members also have complained to ARRL about TT QRM on 3690 and 3615 kc. making their net operation impossible. The RTTY fellows in turn tell about alleged malicious interference from c.w. on 30 and 80. So every operator should quickly recognize the need and advantages of calling and working frequency patterns for amateur radioteletype operation, as well as the desirability of registering RTTY (as well as amateur c.w. and 'phone) net frequencies not in conflict with other current operations.

It is apparently not so easy to find the right RTTY frequencies, agreeable to all interested, for this, however. ARRL, after studying the desirability of avoiding VE 'phone, band edges popular for DX and net operations, came up with the suggestion to use 3620, 7070, 14,140 and 21,210 kc. (p. 77, Apr. QST) for RTTY calls. The ARTS, W2NSD, proposed 3620, 7140, and 14,340 kc., the latter a frequency ARRL couldn't recommend, in any event, before FCC decision looking to extension of A3 to the 14,350-kc. band edge. The So. Calif. ARTS, after study of all three, recommended three new choices -- 3550, 7000 and 14,125 kc. -- for RTTY working purposes. The 3550-kc. spot, a c.w. channel long recognized and used as a National Calling and Emergency frequency just couldn't also be a working frequency for RTTY at the same time. ARRL has no quarrel with such frequencies as 7140, 7000 or 14,125 kc. if one wishes to ignore possible harmonically related choices that permit use of one crystal for a quick band-to-band switch with high stability and reliable reception on stand-by receivers if desired. The correspondence has been felt by ARRL to be highly profitable to all in any event, since if RTTY experimentation is pointed toward any or all of the specific points named except 3.55 Mc. it will make for better contacts for RTTY, and insure a minimum of grief for c.w. operators on all the other frequencies in the bands!

FCDA, as part of its civil defense planning, issued in January a working draft of a frequency plan for use of RACES frequencies for study by the states. Since the draft included no F1 recommendations or provisions, the League called attention to this. As a result a revised FCDA recommendation includes, earmarked for RTTY, a 3504-kc. working and a 3606-kc. calling channel in the 10-kc. segment at this band edge, to which RACES planning is limited. W2NSD in response to a letter mentioning the above writes, "The traffic-handling ability of TT should make it a valuable asset in emergency. Our thanks to ARRL for having this change put through."

Comments from all amateurs interested in the sharing problem posed in TT and A1 operations, are to their choices of the voluntary frequency possibilities, and if they approve the principle for calling and working RTTY use, will be appreciated. A postal card to ARRL will give us your views on the frequencies put forward. With sufficient encouragement we'll consider publishing RTTY frequencies in QST as National RTTY Calling and Working Frequencies. The satisfactory degree of RTTY use of 3620 kc. leads us to note 3620 kc. the first such spot frequency (other than the RACES recommendations, that is) for QST listing.

We'll listen on all the additional frequencies mentioned above and count our postal card responses as favoring voluntary designation for RTTY Calling and Working Frequencies as between 7070, 7000, or 7140 kc., likewise 14,140 or 14,125 kc. If you have no objection to 21,210 kc. add whether you think that should be included in the designations or not. As we see it, the earlier in the game it is possible to pin-point what we are working toward in those voluntary areas of agreement in which we have no assist in the form of FCC regulations, the better off we are.

Prominent Third Harmonics? W0QBW/4, ARRL Official Observer, has noted a number of amateur signals being radiated in the vicinity of 5400 kc. since the opening of the new 40-meter 'phone band. He suggests the possibility of radiation of the 3rd harmonic of 100-meter crystals when looking for a higher harmonic. It is sug-
gested that all amateurs check their output for radiation at the wrong spot and take proper steps to prevent such radiation. This is especially important whenever setting up in a new band.

Over to You. A fast come-back is a good thing; this can be promoted or arranged best by setting up for break-in or push-to-talk arrangements. During QSOs a lot of time can be wasted by slow control procedure or inconvenient switching arrangements which some good station planning can cure. After initial contact it’s not so necessary to repeat the called and calling station calls several times; a one-by-one or two-by-one call will do the trick, or just a BK and what you have to say, remembering to comply with the FCC identification procedure at minimum required intervals. We had more on identification on the air, especially as applies to network-identification, in this department of March QST.

Honest Reports Called For. How are you on giving honest or candid reports? Anxious to receive them, but a Casper Milquetoast on giving the truth when unflattering, perhaps. An occasional letter (or listen) reveals that as well as good ones there are less handsome signals and some disgusting ones to be heard. Except for FCC citations there’s little reason conditions should improve unless someone will be honest with the guys and tell them how they sound. It’s no insult to tell a DX fellow that he’s T5 — a “musically-modulated note.” This is better than one “slightly musical” (T3) or “moderately musical but rather rough” (T4) and way above “extremely rough hissing note” (T1) or “very rough u.s.c. note, no trace of musicality” (T2). The definitions are quoted from this part of the scale, since they’re good definitions and ought to be used, or even the better one, “modulated note, slight trace of whistle” (T6), when deserved. Send a radiogram for the free ARRL Operating Aids card. Keep all the RST definitions before you to use as you operate, if needed.

Use voice? So much the better. Here in reporting you can describe accurately in some detail what you hear. On all signals stability (as checked by b.f.o.) should be tested if time permits, drift mentioned if it can be noted. In c.w. reporting don’t forget to add a C for chirp (short-term instability) or K for click when noted; these signal defects are among those most bothersome to other operators trying to use our common bands for communication.

Our Versatile Hobby. That there are so many specialties within amateur radio is one of the reasons it has such fascination. A station well-operated at a steady speed 12 to 20 w.p.m. can be a joy to copy. Not so people who bat a bug at 30 when incapable of sending at half that speed well. Interest in DX today may turn to traffic or v.h.f. or ‘phone tomorrow. The new 7-Mc. phone band already has its followers. Some come from 28 Mc. or migrate from 3.5 Mc., hoping QRM will be a little less or at least have a different pattern. The Novice gang is getting increasing results from “forty.” There’s the satisfaction of traffic and net operations, real two-way commun-

cation accomplishment, perhaps the appeal of amateur (RACES) civil defense drills, or the high satisfaction of getting s.s.b. or RTTY gear working, or helping a newcomer obtain his first results. To become a respected organizer of an AREC or RACES group, or an NCS or RM or PAM or “wheel” otherwise in operations may require surmounting some problems but can be a richly rewarding personal experience.

— F. E. H.

MEET THE SCM’s

Fred E. Ward, WSLUX, recently elected to a term as SCM of Arkansas, is most active on 80 meters. His transmitting equipment, located in the garage, consists of a Signal Shifter, Milken exciter, and p.p. 610s running 400 watts with 605 modulators, Harvey-Wells De luxe and a BC-696. For emergency work he has on hand a BC-654 and a BC-375. Receivers include an SX-28, a BC-348Q and an HPS. The antenna used is a long wire on 60-foot poles.

Fred received his first license in 1946, although his interest in amateur radio goes back considerably earlier. At present he holds radiotelephone 1st-class and radiotelegraph 2nd-class commercial tickets. He has received a Code-Proficiency certificate for 25 w.p.m. and Public Service certificates for his work in the Arkansas blizzard and ice storm of January, 1949, and the February, 1951, “Big Freeze.” A former Route Manager and Official Observer, he now holds Official Relay Station and Emergency Coordinator appointments. He is past-president of the Harrison Amateur Radio Club and a member of the Rag Chewers Club.

In addition to his position as radio engineer for the Fred Ward Radio Service, he is employed as chief engineer at KHOZ, maintains radio equipment for the Arkansas Power & Light Co., Arkansas Western Gas Co., and the local police department.

A.R.R.L. ACTIVITIES CALENDAR

May 9th: CP Qualifying Run — W6OWP
May 15th: CP Qualifying Run — W1AW
June 6th-7th: V.H.F. Contest
June 7th: CP Qualifying Run — W6OWP
June 15th: CP Qualifying Run — W1AW
June 20th-21st: Field Day
July 3rd: CP Qualifying Run — W6OWP
July 14th: CP Qualifying Run — W1AW
July 18th-19th: CD QSO Party (e.w.)
July 25th-26th: CD QSO Party (phone)
Aug. 1st: CP Qualifying Run — W6OWP
Aug. 12th: CP Qualifying Run — W1AW
Sept. 6th: CP Qualifying Run — W6OWP
Sept. 17th: CP Qualifying Run — W1AW
Sept. 19th-20th: V.H.F. Contest

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Even while we write, FCDA conferences which include RACES as a major subject are being held, and some debate is being had on the status of the amateur FCDA, at long last picking up some speed in its implementation plans for RACES, is naturally running into some resistance from those groups who have gone ahead on their own and who now feel, and understandably so, that their plans are not only better than FCDA's, but are actually being put into effect. Thus, we have a fait accompli.

The FCDA Regional conferences are doing much toward clearing the air, toward clarification of their positions and giving us an opportunity to clarify ours. ARRL headquarters was represented at such conferences in Boston, Cleveland and Chicago, at the request and invitation of FCDA. Amateurs were specifically designated by ARRL to represent us at Denver and Seattle. At Dallas, at Olney, Md., and at Jacksonville, Fla., there were amateurs present who took part in the discussions. Probably there will be (or has been) another conference on the West Coast in which we will want to be (or have been) represented.

The fact that representatives of the Amateur Service are eagerly sought after to attend these conferences is indication of a desire to learn and understand our viewpoints as well as to expand theirs. In the conferences we have attended there has been an undercurrent of sincerity which overrides any heat which might accompany differences of opinion or viewpoint. We all have the same objective — to provide Amateur Radio Amateur Civil Defense radio service to supplement existing wire lines and to provide certain facilities which wire cannot provide. It cannot be done without us. We cannot do it without close collaboration with civil defense officials. The atmosphere of cordial good relations which has come to exist must prevail.

On February 19, 1953, Nebraska was again visited by a snowstorm of blizzard proportions. Roads were blocked and communications disrupted all over the state. Both the 75-meter and 80-meter nets were alerted with W7WYX and W9EQR as NCSs respectively. The nets continued activity through Feb., 22nd, when communications lines were back in order. The following did outstanding work, although many others participated: Ws BDO BDO HXX KOK RDN and ZJF. An increasing amount of traffic was noted flowing through Nebraska amateur channels during these emergencies. It appears that public utilities, government agencies and relief agencies are becoming increasingly aware of the value and availability of the ARSC.

The Northwest Texas Emergency Net received a workout on Jan. 22nd when a cold wave with ice and snow left many communities without communications. Information on trains, telephone and telegraph services, and requirements of isolated towns were handled by amateur radio. One of the outstanding features was the request for information on a train between Slaton, Texas, and Clovis, New Mexico, which was routed on 10 meters into Lubbock, then on 75 meters to Amarillo, then by a Power Company "carrier system" into Clovis and return same way. Not much damage was done, and the emergency period was short, but the Emergency Corps learned a few things. Amateurs working in the 18-hour emergency included Ws 1WQ MMH FDD IGI 5NQ QHI Q4G RWC INFO HBD WILLOW. The following were handled from 1200 to 2245 on January 15th, with some breaks from other emergency traffic for southern Minnesota. The Milwaukee Railroad had all their wires down between Fairmont, and Wells, Minn.; this traffic was handled by W9FPA, W9DFC and W9TSTT, and the Estherville situation was handled between W9TSTT, W9GEL and W9GMD.

On December 14, 1952, the San Diego County ARSC furnished communications for the Torrey Pines Sports Car Road Race near San Diego. Mobile stations were located at each turn to report (1) condition of cars, (2) collisions, (3) position of cars and (4) crowd control information. There were 12 mobile stations on 23.95 Mc. with W6EUW being the NCS. Two auxiliary units were on 3.9 megacycles in standby—communication with W6EWU in San Diego in event of a possible major accident or crowd disaster requiring additional ambulances and police. The operation was quite successful. During the main race messages were flowing so fast that it was necessary for stations to be temporarily identified by number (such as "S" as in station 5); instead of call letters on each transmission with call letters given at appropriate intervals. The following amateurs participated: Ws AAY BLV EWU TOP ITH 1BLI JEC JIP KSI MIT NBC ODR PKV REO SCK RSK WYA YCP and ZUM.

Fifteen SECs reported for 3415 ARSC members covering January activities. We list the sections represented here, and will henceforth list any new sections represented by regular monthly SEC reports: Los Angeles, Tenn., So. N. J., Nevada, Vt., West J., Colo., El. X., N. Y. C., L. I., S. Dak., E. Fla., Iowa, Ga., Ws. and B. C. Note that they are well scattered as to location. We would like to have each SEC make an effort to submit at least one report on Form 8 in 1953. How about it?

D.C. GETS FIRST RACES AUTHORIZATION

On March 6, 1953, FCC informed District of Columbia Radio Officer WP3WB (who is also ARRL EC) that he had approved the RACES Communications Plan for the District of Columbia, the first to be so approved. Six licenses were granted at the same time to WP3WB, W5NL and W3ECP, the latter two having been designated Alternate Radio Officers.

The approval of the D. C. Plan marks the culmination of many months of planning and conferences by Washington amateurs. The plan had its inception with the appointment, in October of 1951, of WP3WB as Civil Defense Amateur Radio Officer, at which time a survey of available amateur equipment and personnel was begun. As early as the Spring of 1951 amateurs in the Washington Metropolitan Area (including adjoining counties in Maryland and Virginia) had arrived at a mutual sharing plan based on the earth-skew RACES frequencies. In addition to adoption of these regulations in August of 1952 work was begun to prepare a communications plan which would meet the combined approval of local and Federal civil defense and FCC. The

Mae, W4NJE, is the new SEC for Tennessee, replacing W4AEE who recently resigned for personal reasons. A mighty fine operating position! W4NJE is OPS and EC in addition to his new SEC job, and holds three Public Service Certificates from ARRL. Being SEC for Tennessee, a wide-awake section emergencywise, will be no easy job.

QST for
initial plan received one disapproval by FCDA and had to be resubmitted.

The design of the D. C. RACES Plan accepts as its basic premise the proposition that a radio facility of any description, a communications center for whatever operating civil defense service requires communication. The available frequencies and equipment preclude the assignment of radio gear to any service for its exclusive use. For civil defense purposes, D. C. is divided into four zones, each with its own control center. The approved plan calls for a command circuit between each of the four zone control centers and the command or alternate command posts within the zone. It calls for two nets from each control center: (1) a fixed and portable set, and (2) a mobile net.

Amateur equipment will be utilized wherever possible and an immediate recruiting program is being initiated by W3NL for mobile operation and by W3ECP for fixed and portable operation. As Alternate Radio Officers they supervise the operations and the personnel involved therein.

--- W3PWB, EDI.C District of Columbia

CODE-PROFICIENCY AWARDS

Have you received 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 WIAW will be held on May 16th at 2310 EST. Transmissions will be made simultaneously on 1887, 3556, 7120, 14,100, 21,020, 52,000 and 146,000 kc. The next qualifying run from W60PP only will be transmitted on May 9th at 2100 PST on 3556 and 7138 kc.

Anyone 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 WIAW each evening at 2310 EST. References to texts used on several of the transmissions are given below. Those 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 in step with WIAW.

Date Subject of Practice Text from March QST
May 8th: Lunar DX on 14.4 Mc., p. 11
May 13th: The Transition... . p. 18
May 12th: A Handy Handy, p. 29
May 14th: Let's Listen, p. 43
May 18th: Combining the Antenna Coupler... , p. 17
May 20th: Signal Break-In... . p. 20
May 26th: The Radio Amateur Civil Emergency Service, p. 50
May 28th: The Poor Man's DX Gitter, p. 38

WIAW OPERATING NOTE

Effective April 26, 1953, all WIAW operation as detailed on page 67, March 1953 QST, will change to Eastern Daylight Saving Time. This will mean in effect that the above-listed frequencies will be changed to the 14-hour schedule. All transmissions will be made within the limits of 7120 to 2100, 14600 to 3556 kc. The schedule will be published in the June 1953 QST. Revisions of this operating note will be made as necessary. All times given in Eastern Daylight Saving Time.

WIAW SUMMER SCHEDULE

(June 1 through September 26, 1953)

(All times given are Eastern Daylight Saving Time)

Operating/Visiting Hours:
Monday through Friday: 1300-0100 (following day).
Saturday: 1900-0230 (Sunday).
Sunday: 1900-2300 (Monday).
A mimeographed local map showing how to get to main highways (or from Highway 65) to WIAW will be sent to amateurs advising their intention to visit the station.

Official ARRL Bulletin Schedule: Bulletin containing latest information on matters of general amateur interest are transmitted on regular schedules:

Frequencies:
C.W.: 1887, 3556, 7125, 14,100, 21,020, 52,000, 146,000 kc.
Phone: 1887, 3556, 7125, 14,280, 21,350 kc.; 62, 146 Mc.

Times:
Sunday through Friday, 2000 by c.w., 2100 by 'phone Monday through Saturday, 2330 by 'phone, 2400 by c.w.

General Operation: Use the chart below for determining times and frequencies for WIAW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 30, and 25 w.p.m. on Monday, Wednesday and Friday, and at 5, 7, 14, and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies. Code practice starts at 2310 each day. Approximately 10 minutes of practice is given at each speed. On June 15th, instead of the regular code practice, WIAW will transmit a certificate qualifying run.

WIAW GENERAL-CONTACT SCHEDULE

(In Effect June 1 to Sept. 27, 1953)

WIAW welcomes calls from any amateur station. Starting June 1st, WIAW will listen for calls in accordance with the following time-frequency chart.

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<tr>
<th>Time (EDST)</th>
<th>Sunday</th>
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# Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin.
* # Operation will be on 2100 or 3555 kc., whichever shows the greater activity.

WIAW will listen for Nove by licensees on the Nove portion of this band before looking for other contacts.

May 1953
BRASS POUNDERS LEAGUE

Winners of BPL Certificates for February traffic:

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<th>Call</th>
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</table>

Supplement to Net Directory

The following list of nets will supplement and correct the listing on page 114 of November, 1955, QST and supplemental listings in the January and March issues. This list comprises information received between the dates of January 20, 1955, and March 15, 1955. An asterisk indicates correction from a previous listing since September, 1952.

<table>
<thead>
<tr>
<th>Name of Net</th>
<th>Freq.</th>
<th>Time</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cascade Traffic Net</td>
<td>1009</td>
<td>1300 PST</td>
<td>Mon., Tue., Thu., Fri., Sat.</td>
</tr>
<tr>
<td>Flamingo Net (FZS)</td>
<td>28,044</td>
<td>1800 EST</td>
<td>Fri.</td>
</tr>
<tr>
<td>Maritime Phone Net</td>
<td>3700</td>
<td>1900 AST</td>
<td>Daily</td>
</tr>
<tr>
<td>National Net (CDNJ)</td>
<td>3605.5</td>
<td>1900 EST</td>
<td>Tue.</td>
</tr>
<tr>
<td>New York State Net (NYS)</td>
<td>3815</td>
<td>1800 EST</td>
<td>Mon.-Sat.</td>
</tr>
<tr>
<td>Norvoc Traffic Net</td>
<td>3745</td>
<td>1500 EST</td>
<td>Mon.-Wed., Fri.</td>
</tr>
<tr>
<td>Palmetto Net (PN)</td>
<td>3875</td>
<td>2000 EST</td>
<td>Mon., Sat.</td>
</tr>
<tr>
<td>Quincy Mass. Sector 5 CD Net*</td>
<td>38,990</td>
<td>2100 EST</td>
<td>Mon.</td>
</tr>
<tr>
<td>Skiers Show Service Net</td>
<td>3000</td>
<td>1900 EST</td>
<td>Fri.</td>
</tr>
<tr>
<td>Swinging Shift Net (SSN)*</td>
<td>2170</td>
<td>2000 EST</td>
<td>Mon.</td>
</tr>
<tr>
<td>Teen-Ager's Net (TAN)</td>
<td>7175</td>
<td>1800 EST</td>
<td>Sat.</td>
</tr>
<tr>
<td>Trunk Line Atlantic-Pacific (TLP)*</td>
<td>3333</td>
<td>1900 EST</td>
<td>Mon.-Fri.</td>
</tr>
<tr>
<td>Whiteside VHF Radio Net</td>
<td>144,800</td>
<td>1915 CST</td>
<td>Tue.-Sat.</td>
</tr>
</tbody>
</table>

TRAFFIC TOPICS

Traffic that is "slower than walking" is poor publicity for amateur radio. It seems to us that a lot of traffic is taking a long time to reach its destination these days; but rather than froth at the mouth and say "Shame! Shame on you!" to amateur traffic generators in general, and to desert our own traffic nets or systems for those sponsored by semi-amateur or quasi-amateur organisations, maybe we ought not first to see if we can't figure out what is wrong, what is happening.

Probably no two people agree on that. In the first place, let's recognize that the situation is not so bad as some would have us believe. You always hear about the message that took two weeks to go from here to there, but not very often about the one that went from thither to yon in couple of hours. Much more often than not we have handled bewildered traffic, we have handled some which had originated far away only a few hours ago.

After that, it's a matter of opinion. Newcomers to the traffic game being looked down upon by the oldsters, lack of standard net procedure, poor conditions, inaccuracy and carelessness in operation, lack of system or failure properly to follow the system that does exist, fighting among ourselves — all these are only a few of the contributing factors to what The Old Man would have called "Rotten Traffic."

Wish we could write it up the way he did.

Even if we agree on the causes, that's only part of the battle — the smallest part. The correcting of them is something else again, and about all we can do is to study and do what we can to educate the minorities who disagree that the standards set by the League are the best standards often simply will not comply. Even in our own National Traffic System the standard procedure outlined in the rules is not followed by some nets. This is because we are all volunteers and don't have to comply. But if we did comply, all of us, there would be vast improvement in our traffic-handling set-up.

We understand all this, and you should, too. It is not a matter for bitterness or disgust; that serves no useful purpose. It is simply a matter of patience, waiting for the time when new ideas considered radical or revolutionary by some are generally accepted. Meanwhile, we'll continue to promote in every way we can, we think the majority consider the best way of doing things. If you do not agree, you ought to give consideration to the general benefit before you haughtily go your own way.

In these basic concepts, rather than in attention to any particular details, lie the roots of any poor traffic handling that might be growing in our ranks.

The Transcontinental Relay Net reports 3728 messages handled by nine stations in 28 sessions, averaging 133 per session. The Early Bird Transcontinental Net reports 191 messages handled by 46 stations in February, an average of 15.9 per meeting.

National Traffic System. In the Pacific Area there has been a proposal under discussion which the rest of you should know about. It concerns the creation of a Pacific Area NTS Staff, a group of about seven traffic amateurs to consider the problems not just of one net, but of all NTS nets in that area, especially the all-important aspect of liaison between nets at the various levels, the only thing which makes NTS different from and superior to anything we traffic men have heretofore attempted. This idea is not yet a reality even on the West Coast, but is being kicked around. Our proposal was adopted as staff in the Pacific Area, one of whom would be chairman. The membership would consist of both regional net managers, the area net manager, the assistant TCC manager for that...
area, and three other prominent traffic men in the area who do not have any single or specific net not to worry about and can therefore devote their thoughts and energies toward the system as a whole. Such a staff to shoulder responsibilities for conduct of NTS in their area would undoubtedly help to dispel any feeling among NTS nets that there isn't or should operate without regard to the welfare of other NTS nets they are supposed to work with or into. It would also help decentralize responsibility from this headquarters and generally make it a shared proposition, just as NTS operation is supposed to be. The welfare of the system, more than any particular net, would be the business of the Area Staff. No use kidding ourselves, NTS is dependent for its existence on teamwork. If we don't have that, we won't have an NTS. What do you fellows think of this idea?

February reports:

**Sessional Traffic High Net**

<table>
<thead>
<tr>
<th>Net</th>
<th>Average</th>
<th>Most Consistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1RN</td>
<td>62*</td>
<td>288</td>
</tr>
<tr>
<td>3RN</td>
<td>27*</td>
<td>228</td>
</tr>
<tr>
<td>4RN</td>
<td>40</td>
<td>729</td>
</tr>
<tr>
<td>5RN</td>
<td>40</td>
<td>588</td>
</tr>
<tr>
<td>7RN</td>
<td>28</td>
<td>157</td>
</tr>
<tr>
<td>8RN</td>
<td>26</td>
<td>655</td>
</tr>
<tr>
<td>9RN</td>
<td>22</td>
<td>148</td>
</tr>
<tr>
<td>10RN</td>
<td>24</td>
<td>583</td>
</tr>
<tr>
<td>11RN</td>
<td>40</td>
<td>189</td>
</tr>
<tr>
<td>12RN</td>
<td>20</td>
<td>825</td>
</tr>
<tr>
<td>13RN</td>
<td>18</td>
<td>602</td>
</tr>
<tr>
<td>14RN</td>
<td>20</td>
<td>507</td>
</tr>
<tr>
<td>15RN</td>
<td>40</td>
<td>116</td>
</tr>
<tr>
<td>16RN</td>
<td>22</td>
<td>222</td>
</tr>
<tr>
<td>17RN</td>
<td>40</td>
<td>113</td>
</tr>
</tbody>
</table>

**Total** 472 770 181 16.4

**Record** 649 804 181 16.4

*Out of 40 sessions scheduled.

Two new records for the Jan-Feb-Mar. quarter: 1RN sets a new record of 181 for traffic in one session, topping the previous record of 110 made by TEN in March, 1951; and the over-all average of 16.4 per net session is the highest set for this quarter, the previous record having been 14.2 in February, 1952. The total number of net sessions being considerably lower than the record helps account for this, of course.

Everybody agrees on one thing: conditions in February were lean! Enough said. In 1RN, W1DVW received a net certificate. W1CHP is going to have to resign his manager's position in 3RN. W5QHI of 5RN says he needs more stations from Arkansas and Western Florida, and compliments the Tennesseans on their fine presentation. A new QNY system has been developed by 0RN, which announces that it will continue all summer (won't we all), welcomes W4BAZ back into the fold, and has granted net certificates to W9QLW, W9LZI and W4WLC, TEN certificates have been issued to W7QGK, W9RDN and W1QWZL, W5QVY has received his EAN certificate. EAN attendance this year is lead by 4RN with a record impossible to beat — 100%.

In the Transcontinental Corps, there are still spots which need filling, especially EAN-PAN liaison involving late-hour operation by East Coast stations. If you can muster a potent signal on 80 or 40, know how to handle traffic, and would like to have a once-a-week schedule for long-haul traffic, let us know. We need you.

**FEBRUARY FMT RESULTS**

Open to both ARRL Official Observers and other amateurs, the first 1953 ARRL Frequency Measuring Test was one of the most successful activities of its kind yet held; entries were received from 184 participants (78 Official Observers and 106 net operators) who made 672 measurements. Each entrant has received an individual report comparing the accuracy of his measurements with those made during the test by a professional frequency-measuring laboratory.

Honors for the top position in the OO group go to William N. Fellows, W6CIX, whose measurements averaged out to 0.2 parts per million. Two star performers in many previous tests, Homer Apple, W4HER, and Lloyd W. Root, W8RH, tied for the lead in the non-OO category with a rating of 0.5 parts per million. The standings of other leaders in the test are given below. Since the official readings can only be accredited to 0.4 parts per million, the decimel is shown only to establish listing order. In accordance with the announced rules, no entry consisting of a single measurement was considered eligible in the competition.

<table>
<thead>
<tr>
<th>Observers</th>
<th>Parts/Million</th>
<th>Parts/Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>W6CIX</td>
<td>0.2</td>
<td>W4HER</td>
</tr>
<tr>
<td>W6CIX</td>
<td>0.2</td>
<td>W8RH</td>
</tr>
<tr>
<td>W6CIX</td>
<td>0.4</td>
<td>W4HER</td>
</tr>
<tr>
<td>W6CIX</td>
<td>0.6</td>
<td>W8RH</td>
</tr>
<tr>
<td>W6CIX</td>
<td>0.8</td>
<td>W6CIX</td>
</tr>
<tr>
<td>W6CIX</td>
<td>1.5</td>
<td>W4QCN</td>
</tr>
<tr>
<td>W6CIX</td>
<td>2.5</td>
<td>W4HEC</td>
</tr>
<tr>
<td>W6CIX</td>
<td>3.5</td>
<td>W6CIX</td>
</tr>
<tr>
<td>W6CIX</td>
<td>4.5</td>
<td>W6CIX</td>
</tr>
<tr>
<td>W6CIX</td>
<td>5.0</td>
<td>W6MRM</td>
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<tr>
<td>W6CIX</td>
<td>5.1</td>
<td>W6QF</td>
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<tr>
<td>W6CIX</td>
<td>5.4</td>
<td>W6CIX</td>
</tr>
<tr>
<td>W6CIX</td>
<td>6.0</td>
<td>W6CIX</td>
</tr>
<tr>
<td>W6CIX</td>
<td>7.0</td>
<td>W6CIX</td>
</tr>
<tr>
<td>W6CIX</td>
<td>7.0</td>
<td>W6CIX</td>
</tr>
</tbody>
</table>

The following ratings are based on a single measurement: OOs — W8PZT 0.0, Non-OOs — W6QVA 4.0, W6QSA 4.5, W6QCB 9.1, W4FRW 9.7.

**DX CENTURY CLUB AWARDS**

**Honor Roll**

W1FH... 232 QSL... 264 W3BR... 264
W6WG... 276 W4AM... 278 W8SN... 278
W6P... 245 W2KX... 277 W3CPY... 277
W6X... 246 W3HC... 297 W6BD... 284
W2ES... 244 W8TG... 287 W8MEK... 287
W6BY... 242 W6BG... 287

**Radio Telephone**

W1FH... 225 W6KRC... 265 W1CX... 291
W6K... 265 W1W... 269 W1CMV... 285
W6QH... 219 W5BW... 293 W6MK... 196
W86GW... 202

From February 15, to March 15, 1953, DXCC certificates and endorsements based on postcard contacts with 100 or more countries have been issued by the ARRL Communications Department to the amateurs listed below.

**New Members**

MFPAA... 187 4XIG... 217 W2QQ... 100
W3FJM... 184 W4QV2... 104 W9QMG... 100
W1K... 184 W4QW... 104 W5TNN... 100
W3DML... 113 4P34G... 103 W8SIL... 100
W2OKM... 110 4P1LT... 103 W8U... 100
W2JHF... 110 W8BCW... 102 3LACK... 100
E6EDC... 108 W8BCC... 102 3LALL... 100
W2VMB... 110 W8KAL... 102

**Radio Telephone**

W3JMN... 110 5Y4K... 104 5Y4KL... 103

**Endorsements**

W2WZ... 202 4MXRE... 194 W4AAM... 133
W2XNE... 219 W6A... 191 W2ABS... 150
W8C... 215 W2WJMC... 190 W8CN... 120
W5BGW... 210 W6GUHA... 170 W8RST... 120
W9FRC... 201 W8MC... 170 W8QXY... 120
W6UOX... 201 W8WM... 120 W8V... 120
W4BRR... 200 G4TU... 120 W9B... 120
W4OM... 200 W8QV... 120 W9Q... 120
W9LNM... 200 ON4PA... 121 W8C... 120
DLYA... 300 ZC4P... 120 W8OMK... 120
W8ADZ... 199 W6WZ... 140 W8AS... 110

**Radio Telephone**

CF1CL... 101 W8AN... 182 W9CW... 111
W8CQ... 183 1ICAR... 133 CTTDX... 110
W4MRB... 187 ZAX... 120 HB9LA... 110
W8WM... 120
• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCM members for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION
EASTERN PENNSYLVANIA — SCM, John H. Dubois, W3JXE — SEC: IGW, RMa: AXA, BIP: PAF, PYV, E, PA: Nets: 3610, 3915 kc. The North Branch ARC of Eastern Pennsylvania participated in the Hobby Show, sponsored by the Rotary Club of that town. The Hill School station, MWL, now is on the air with a TVI-proof BC-510 on all bands. DL, W3L, has constructed a TVV with a 35 watts WYX, and IGW, would welcome additional members. EAN is sporting new p.p. 813 final. LYU just finished Viking III. PFL, W3K, is planning on a trip to St. Petersburg, Fla., in a few weeks. The Tampa Amateurs are getting ready for their February meeting at the SRHA held a very interesting talk on bomb disposal and protection. SDO and JAV seem slightly disappointed in the failures of ARRL's recently erected. It can't be the fault of the transmitter as Tony has a brand-new 32V-3. Traffic: K2BB 387, W2RG ZL 21, ASG 12.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SYV — SEC: UTH, RM: RUP, FM: GSS, NYS, 3595 kc., 8 P.M. NYS C.D.: 3495 and 3993 kc., 9 A.M. Sun. FXJ is on 40, SPO is on 40 and 75, K2N2 AUY, BRW, and the amateurs in a windstorm. UTUL has 360B at 135 watts on 2 meters modulated by p.p. 807s in C1 A23. FCQ is assigned as Broome County EC and YLM has accepted this appointment. K2CQS; Licenses to CQ for 1963. In demonstrating mobile radio to members of the Black River Valley RC, T2M was contacted and instructed to transmit the Christmas greeting to the group. The possibility of a c.d. net with TEP, Lewis County EC, YFZ enjoyed the CD Party. While attending the VABS advisory committee meeting, a new ham was presented with a plaque. MTB, 18B, LEQ, and AEE, FSB is at W2HD. VEF visited hams in the Albany area. TPN is busy instructing for their regular exams. TPN has a new ham, R6 MNS. Call Book for top annoyance in the NYS C.W. Net. Most consistent QNI for 1962 was K2F 253, PCM 261, F2R 256, OE 111. Walks were 50 radio cards each as 2nd prize, then in order were AOE, COU, SJF, DJF, RJJ, KEL, ZRO, JWU, RUT, NAI, HUM, W2Q, UTH, LBS, K2DZ, and IFP. Traffic: (Feb.) W3VJ 110, W3GMD 116, K2QF RT, REJ 97, NAI 228, COU 92, 80, KEL 75, RUT 48, SJF 46, RJJ 34, K2DZ 18, W2HUU 12, GHS 1. Join the W2HRA 19, AS 18.

SOUTHERN NEW JERSEY — SCM, Lloyd L. Gainey, W2TVC — SEC: K2BG, Amateur radio in the Camden and Burlington County Amateur Radio Association for a large scale o.d. drill held March 8th. More than fifty amateurs participated in this drill. HIA has been appointed o.d. drill chairman for the April drill. K2BG, a d.o. member of NORTHERN NEW JERSEY — SCM, Ford L. Hinkey, W2CQV — SEC: K2BG, Amateur radio in the Camden and Burlington County Amateur Radio Association for a large scale o.d. drill held March 8th. More than fifty amateurs participated in this drill. HIA has been appointed o.d. drill chairman for the April drill. K2BG, a d.o. member of NORTHERN NEW JERSEY — SCM, Ford L. Hinkey, W2CQV — SEC: K2BG, Amateur radio in the Camden and Burlington County Amateur Radio Association for a large scale o.d. drill held March 8th. More than fifty amateurs participated in this drill. HIA has been appointed o.d. drill chairman for the April drill. K2BG, a d.o. member of NORTHERN NEW JERSEY — SCM, Ford L. Hinkey, W2CQV — SEC: K2BG, Amateur radio in the Camden and Burlington County Amateur Radio Association for a large scale o.d. drill held March 8th. More than fifty amateurs participated in this drill. HIA has been appointed o.d. drill chairman for the April drill. K2BG, a d.o. member of NORTHERN NEW JERSEY — SCM, Ford L. Hinkey, W2CQV — SEC: K2BG, Amateur radio in the Camden and Burlington County Amateur Radio Association for a large scale o.d. drill held March 8th. More than fifty amateurs participated in this drill. HIA has been appointed o.d. drill chairman for the April drill. K2BG, a d.o. member of
On this page of the issue of last December, the writer broached the idea that versatility in ham radio was desirable. About a month ago, the gypsy in me had me eyeing another band on which, until then, I had done no operating. This was the comparatively new 21 mc. band which should be a cross between the 10 and 20 meter bands. Which of these two would it resemble most? Well, there was one way to find out. Accordingly, the old 6 meter two-tuber was renovated to use a 6AG7 grid-plate oscillator-tripler driving an 829 final amplifier to about 65 watts input. All this time the bugaboo of 21 mc. IF amplifiers of neighboring TV receivers stared me in the face. I could spend weeks building a bang-up TVI proofed transmitter, but, for a try-out, I took the easy course and planned to operate only on Saturday and Sunday mornings, and early afternoons. The antenna used is a folded dipole in the attic where it is out of the rain and public view. The first two week-ends netted me eight countries, four states and one TVI complaint. The latter was scored only because I inadvertently opened up on Monday morning of the holiday, right in the middle of Arthur Godfrey’s program! A home-built hi-pass filter satisfied this case. The HRO receiver was used with an AC coil.

Operation on 15 meters was a pleasant surprise. My first QSO was with W6ZZ, who turned out to be ex W1WV, an old friend and ex-neighbor. This was the first contact with Miles since he retired and moved to California. Another surprise was a contact with a station in Newport in northern Vermont. That path is just impossible at this frequency. A chat with KP4QR or XE1PJ was enjoyed about every morning that I was on. My biggest thrill so far came when I hooked MI3SL in Eritrea which my cohort W1JEL with his 97 countries hasn’t got yet. I understand Eddie has already erected a 15 meter antenna. All in all, it looks like a swell band. On March 28, it will have been opened up for phone and novice operators. Possibly, TVI will scare a lot of hams from getting on the band at home. Possibly, for this reason, it may turn out to be our best mobile DX band. As KP4QR has brought out, there isn’t any TV to scare off the DX stations — yet.

National receivers are prepared to take care of ham operation on 21 megacycles. The NC-125 and NC-183D have full band spread on this band. A special band spread coil is available for all models of the HRO receiver from the modern HRO-60, right back to the 2½ volt models, if you are still using one. That’s not intended to be funny, as some are still in use. The HRO coil is the type AC, and works very nicely. Well, OM, BCNU there?

Cal Hadlock, W1CTW
OPERATION—"TVI PROOFED"*

EXCITER/FINAL TR-1 TV

To borrow a phrase from the military, it can be said that Eldico's TR-1 TV Exciter/Final is Operation—"TVI Prooed."** Since amateurs throughout the country have rigs which were ideal before the Tennessee Valley Indians, too much time and money have been invested in them to discard. Now you and Eldico have the answer. Use your present rig with the Eldico TR-1 TV Exciter/Final and operate TVI Prooed.* Just replace your R.F. Section with the TR-1 TV Exciter/Final. Use your own power supplies and modulator—and go on the air TVI Prooed.*

300 watts AM Phone or CW; Band switching 30-40-20-15-10 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 Prooed.*

"Repetition is the spice of life." For 3 consecutive months, Eldico has been featuring the TR-1 TV Exciter/Final. Results—in ever-increasing quantity of letters, comments on the air and sales through our distributors—have more than justified the repetition.

SEE DISTRIBUTOR TODAY OR WRITE ELDICO FOR COMPLETE SPECIFICATIONS

44-31 DOUGLASTON PARKWAY, DOUGLASTON, L. I., N. Y. • BAYSIDE 9-8686
COMPARE THESE REASONABLE COSTS WITH ANY TRANSMITTER

- Exciter/Final — completely shielded — 10½" x 19" panel space (as illustrated).
  Complete kit with Instruction Manual $189.95
  Factory wired and tested $259.95

- Speech Amplifier/Modulator. Hi Impedance Microphone Input. 7½" x 19" panel space.
  Complete kit with Instruction Manual $79.95
  Factory wired and tested $99.95

- Power Supply—1500V DC @ 350 ma; 400V DC; 220 ma and negative bias. 8¾" x 19" panel space.
  Complete kit with Instruction Manual $119.95
  Factory wired and tested $159.95

- TR-1 TV Transmitter—The three units above in standard 28½" high Deluxe Cabinet.
  Complete with Instruction Manual $379.95
  Factory wired and tested $499.95

Chassis, panels, meters, tubes, components, hardware all included. Nothing else to buy!

SEE YOUR DISTRIBUTOR TODAY!
The "FC-46-S" is an insulated flexible coupling designed to provide for mechanical ganging of shafts even though they are angularly misaligned. The smallest dimensions have been incorporated consistent with the rugged construction necessary for general service.

Backlash or setting inaccuracy between control and tuning element resulting from coupling is eliminated by the symmetrical design of the flexible arms and electrical isolation is achieved through the use of silicone-treated steel insulation. Flash-over voltage is approximately 5000 V. R.M.S. Brass hubs and the spring temper phosphor-bronze arms are nickel-plated.

An exclusive and important feature of this coupling is its characteristic of uniform side-thrust through 360° of rotation. This eliminates the tendency to vibrate at high speeds, minimizes bearing wear, and assures accurate tracking.

The "FNC-46-S" is available for use where insulation between shafts is not required. The flexible arms are held securely to a nickel-plated brass ring instead of an insulator.

Have you received your copy of the new Capacitor Catalog? It lists Hammarlund's complete line of standard capacitors sold by responsible dealers across the coast to coast.

SEND TODAY!
The "HQ-140-X" is a new superheterodyne type receiver that incorporates all the advantages of modern professional design and circuitry. In addition, all the outstanding features that have made Hammarlund "HQ's" famous for quality and performance have been retained.

Frequency coverage is continuously tunable from 540 Kc to 31 Mc (555 to 9.7 meters) in six bands with selectivity that makes possible separation of even the most crowded signals. The special patented Hammarlund crystal filter (the same one that's in the "SP-600"!) provides extreme selectivity for the high attenuation of closely adjacent interfering signals. Improved sensitivity, stability and image ratio are featured in this receiver.

Band-spread tuning is available on the four higher frequency ranges, with direct calibration for the 80, 40, 20, 15, and 10 meter amateur bands.

Large, comfortable and conveniently positioned controls, in addition to the many other outstanding features, make it a truly professional type receiver, the ideal instrument for operating in today's crowded shortwave bands. For detailed information write for Bulletin S1.

HAMMARLUND

460 West 34th Street • New York 1, N. Y.
than 100 in attendance. NTD is going to a low. Great Bay AREC has 28-Mc. walkie-talkies in operation. VIL is operating portable in Detroit with 10 watts. JPLHC has established a TVI committee in Madison and is also enjoying the TVI lecture by HCP. FUS has been active on 4-, 7-, and 14-Mc. Phone. RKP has 84 countries confirmed and is looking for more. IZA is active again. A TVI committee has been established in Green Bay by the new v.h.f. club. We regret to report SMPQ and GRENO are returning to their old home at Lawrence College. The Lakeshore Club at Sheboygan has a new ARRL. KXN tried out "phone on 4, 7, and 14 Mc. On 14 Mc., GFL worked VP, PYM, LEE, G4K, G4I, LIV, SDH, and OMO. LEE asked GFL at 2000 CST with average 88 signals over the 185-mile path. How about joining them? W40WLF is on from Greenwood. EYV is playing with the one-eyed monster. W6EJA/10, Emergency Corps provided mobile communications and transportation for Red Cross "Pay or Play" fund drive program. Traffic: W6EJA/10, W6EJA/3A, CFC 508, UX X 170, ODD 74, MQY 69, IQ 64, KZG 32, LSK 52, UX F 44, UX J 34, DZ 32, SFL 19, SDK 18, ERW 17, HER 17, JRE 17, VMV 17, OY 9, VLL/8, OVO 5, FUS 4, IZA 4, KKK 4, RQV 4.

**DAKOTA DIVISION**

**NORTH DAKOTA** — SCM, Everett E. Hill, W6VFP — The North Dakota Hamfest will be held this year in Jamestown July 22th. Let's give the Jamestown Club a wonderful turnout. Information may be obtained from Ken Rich, 898-Ave., S.E., Jamestown, USY. W6JZ reports 1RZ is building a new final with 211a. WSL is building a 813 linear amplifier, and has a 154D. W6IQ and W6BW are working on new antennas. GSC has a new all steel-100-foot tower. KZG west to CAA teletype school in Oklahoma. Field Day is just too far away. Let's get the plans going and get our State listed in the score columns. New receiver-owners include M6E with 183-D and YRD with H6O-9O. VIL is determined to go to the mail in to the Minneapolis Radio Club in Grand Forks for the P.T.A. Your SCM encourages membership and participation in MARS. Contact him for information and application blanks. Traffic: W6ZMY, W6ZME.

**SOUTH DAKOTA** — SCM, J. W. Sikorski, WRRBN — SEC: GCP, PAM: UVL, RM: OLB, Southeastern South Dakota amateurs participated in the first s.a. communications in the State when they assisted the Air Defense Command in a practice exercise. Stations active as planeholders were KE6V and K6A. FMQ/6 is adding a 10-meter FMQ/6 adding a 10-meter

**ARKANSAS** — SCM, Fred E. Ward, W5LUX — Well, Arkansawans have to take a hike for the hams, and as soon as

---

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Mobile Dual Band Antenna Resonator

- one antenna
- two bands
- no switching

Dual mobile antenna loading network for 10 and 20 meter amateur bands. Mounted in the center of a standard mobile whip antenna, it enables the operator to change bands while in motion. Operation is completely automatic, no relays or mechanical control required. After initial adjustment, the BI-NET requires no further attention. Now, for the first time, true bandswapping mobile operation is attainable.

The BI-NET is a taping network consisting of two adjustable, low-loss inductors and a ceramic insulated fixed capacitor. Inductors are silver plated for maximum conductivity. The assembly is enclosed in a streamlined, weatherproof plastic housing and is equipped with ½" × 24 female threads at each end for antenna mounting. Overall size, 4/16" high, 5/16" long, ½" maximum width, weight 4 oz.

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210 SECOND AVENUE SOUTH WEST • WASECA, MINNESOTA
Mallory Mercury Battery-Transistor combination powers new pocket-size Primary Frequency Standard

Expected battery life: five years or more

The term "miniature" is no longer adequate to describe modern electronic design technique. In the race toward smaller and more compact electronic gear the words "sub-miniature" somehow seem more appropriate.

For example, information was released recently by one of the government laboratories that a pocket-size Primary Frequency Standard had been designed and built. Consisting only of a 100 Kc. quartz crystal, a Mallory Mercury Battery, a transistor, and a few miscellaneous parts, this instrument exhibited an accuracy and stability comparable to WWV itself, yet measured less than 1½ inches in diameter by 7 inches long. Crystal ovens, special temperature compensators, heavy power supply components, and even dependency upon the utility company electric line were eliminated completely.

However, the most spectacular bit of information learned about this little gadget, was its expected ability to operate for a period of 5 years or more in normal service without replacing its battery.

Spectacular? Yes! ...but found perfectly possible when the transistor and the Mallory Mercury Battery were used as a team. The extended shelf-life and constant voltage characteristics of the Mercury Battery complement the technical advantages of the transistor perfectly.

Unquestionably the Mercury Battery-transistor combination has become a powerful stimulus to the imaginations of professional electronic design engineers everywhere..., and it is probable that the amateur, too, has indulged in a little day-dreaming along this line. If so, now is the time to take those ideas in hand and make something of them. We understand that transistors are now available at moderate cost from many parts suppliers. And of course, Mallory Mercury Batteries are available in a variety of sizes and shapes from the Mallory Distributor near you. Why not see him today for more information; or a list of Cells available, plus technical characteristics, will be mailed to you upon request. Write to P. R. Mallory & Co., Inc., Box 1558, Indianapolis 6, Indiana, and ask for Mercury Battery information.
per cent of the GSI are required for WAS, Congrats to L.R.W, who won first place and the three-year course in the recent NBC Measles series. Who expects to see traffic nets. MRQ is experimenting on a 7-MC, beam. AF, NE, and CJS have new Comet Communicators. IL1CZI, Sgt. Paul H. Watrous, is on the active on NYSEFN. RTE is a new member of the OTC. Ted has been a ham for 30 years or more. With much regret we note the passing of Tom White, W7VW, 73. WNYC on 3550 kc. 8 P.M. NY5 is on 3580 kc. 8 P.M. YWZ and EU are on 3590 kc. AFB was a recent visit to ARRL- c. meeting in ZQ, S.E. Armistice day, 1918. Present were VP, FCQ, and I1G. The meeting followed an excellent dinner at the Hotel Washington. FCQ was in charge. O. D. directors from several QRAAGS were present.

A better understanding of the problems at hand as well as the release of not one ARES-c. this is the result. Plans are under way for a section meeting to be held one of these days at Poughkeepsie. The Albany County ARC Net has rescheduled the time of the meeting. QRAAG CQ for this one.

NEW YORK CITY AND LONG ISLAND - SCM, George V. Cooke, Jr, W2RBU - Ast, SCM: Harry Dan- ne, K2BV, is a new member of the New York City Club. Captain Danne has resigned his affiliation with the League and is off to a good start with active programming at its meetings, which are held the 2nd and 4th Thursdays of each month at 8 P.M.

K2BV has taken over the NAB control at the Bayshore station of the New York Radio Club, a new club for the Long Island area. The club is located in the Lighthouse Community Center, Bayshore, Long Island. K2BV is now the active in the area. The club meets on the 2nd and 4th Wednesdays of each month at 7 P.M. The club has a new call sign, K2BV, and is active on 2 meters. The club has been very active in the area and has become a popular stop for visitors to the area.

The club has a new QSL and is looking for new members. The club is located in the Lighthouse Community Center, Bayshore, Long Island. K2BV is now the active in the area. The club meets on the 2nd and 4th Wednesdays of each month at 7 P.M. The club has a new call sign, K2BV, and is active on 2 meters. The club has been very active in the area and has become a popular stop for visitors to the area.

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AN EVER INCREASING NUMBER of amateur radio operators are finding that they can take Eimac quality on the highways with them by employing Eimac 4-65A radial-beam power tetrodes in their mobile transmitters. Physically and electrically the 4-65A is ideal for mobile. It is small, compact, rugged, radiation cooled; has a high power gain and requires low driving power and simple circuit design. But one of the best of many features is that through application of filament and plate power simultaneously warm-up periods are eliminated. Also there is no costly battery drain during stand-by periods because the thoriated tungsten filament heats instantly. Although the smallest of Eimac's complete tetrode line, it contains the Eimac specialties of non-emitting Y3 grid wire, pyrovac* plate, input-output shielding and thoriated tungsten filament.

*An Eimac trade name
within 24 hours. Previously, two cablemen had failed to reach the individual advising of the illness of his mother.

HJG is on 40 meters with an 807 final and 75-A1. QDF is building a 40-meter ground-plane antenna. HJG has completed his new 125-watt rig in a beautiful console cabinet. HVG, DRP, and NDS have built walkie-talkies. The Early Bird Net handled 546 messages during February. Traffic Club certificates have been issued to BVL, CIT, ERE, HUI, JXJ, and NNH. BPL code is going to CTO, QVJ, and XJX. ETW, while on a Florida vacation, helped 4DUG handle traffic at the Florida State Fair. PTO has been modulating the sound system at the local theatre.

Traffic: (Feb.) W9CTI 700, X9OXS 800, JXJ 550, W8TXJ 750, CXK 172, QAR 145, K5WBD 140, FAT 88, W8UHI 71, ZLN 50, CQG 44, ERE 36, GEM 24, QMF 29, JSR 24, TG 23, OBE 18, BAF 40, PTO 17, ID 17, RNE 16, BAI 16, BUL 4, ETW 3, BFP 2, CIA 2. (Jan.) W9WJS 12, PTO 8, ETW 7.

NEBRASKA — SCM: Floyd B. Campbell, W5CBH — Asst. SCM: Thomas S. Boydstun, WYX: SEC: JDD, PAM: BVL, RM and NCS Phone Net: VYX, C.W., Net: LDO, Asst. NCS C.W., Net: SAD, and RDN. W9NMAO is now using his Conditional Class ticket. RDN now is on 3.5 Mc. with 250 watts to half-wave center-fed antenna. DOE broadcasts from Vermont for WAS on 7 Mc. The Cobwebb, Net, operates nightly on 28,720 kc, NET is a new member at North Platte. CO now is a.s.a. 2B2 is operating a 12-watt rig and is trying for 40 meters also. LDO, for C.W. Net, reports an average attendance of 12 and a total of 80. SAI is NCS for C.W. Net on Tues. and RDN is on Thurs. on 3.5 Mc. RDN now has a pair of 322s and is running 300 watts. FQB now has a Viking II, having traded in his Stargus 202A. AIN is doing a little repair work on his VFO and rig. The Grand Island and Lincoln Clubs have sent their applications for ARRL affiliation. The Lincoln Club is working very hard to try and put on the 1933 Midwest Convention and needs help from anyone interested. JDH has renewed his SEC appointment. RGG has joined the a.s.a.a. gang. ODB is on 40 meters after all these many months. AIN is collecting parts for new rigs.

Traffic: (Feb.) W9EPA 96, RDN 223, QFX 129, WYX 64, K5WBP 52, W9SAI 48, K5WDL 38, WMW 32, CBW 25, V9J 23, ZJX 23, LEO 19, EVJ 18, W6CB 17, KB5 10, W6Q 10, WJW 9, W6U 8, THF 5, KX 4, CQ 3, AIM 2. DQX, 2, EGGQ 2, IAY 2, W9NMAO 2, W9FPPA 1. (Jan.) W9RMD 33, K5WDL 31.

NEW ENGLAND DIVISION

CONNECTICUT — SCM: Roger C. Amundsen, W1HYF — SEC: LKE, PAM; FOB, RM: KYQ, ON-3640, CPN 3890, OBN-38. QSO is front with a total of 208. The annual W9RMD held in Hartford Feb. 25th, with RDG, LKE, QV, and LHH as speakers, was a highlight of the month. 2VMX-1 is rebuffing, ORF is working DXQ on 80 meters, UNQ is on 40-meter "photograph" DX, RRE is at the "office", PTO is trying 229, PTO is tuning 262, and RRE is tuning 263, PTO is working 800 watts, and is planning CN/CPN get-together.

Traffic: (Feb.) W9CTI 457, KYQ 281, AW 110, RRE 70, CUE 102, AVY 75, BDJ 68, IS 20, EMF 40, NBP/3WBO 32, RFJ 26, HFY 24, LV 24, LQ 19, LV 9, KY 9, OW 4, TXN 2, UNQ 1. (Jan.) W6CO 150, EMF 62.

MAINE — SCM: Orestes R. Brackett, W1PTL — SEC: NYK, PAM: OLQ, RM: LPK. Pine Tree Net meets on 3995 kc. at 1000 Mon. and Fri. through Fri. Sea Gulf Net meets at 3990 ke. Mon. and through Fri. Because of bad conditions during the time that the above net operate it has been very difficult to carry on as the Net Station. I would like to hope that you will be able to find net operating and very interesting. The beginning of Daylight Saving Time the Sea Gulf Net will be closed for the summer. At this time I would like to say that I (W1PTL) am not able to run said net after that time, any one in the State of Maine who wishes to try it is asked to please let me know so that an exchange net can be taken care of by some one in the State. PTO is running the 60- and 20-meter bands to holders of Conditional and General Class ticket the gang is doing a very splendid job and everyone is more than satisfied with the nice signals and the nice procedure they are using. VBU, of Madison, now is ready to work 4UES, KZ5GS, and W1QDO, would like to try out 4UES, KZ5GS, and W1QDO, would like the boys to get in touch with him on 20 meters. He is usually listening around 14.200 kc. He listens from 1400 p.m. until the band goes out and Sat. afternoons and all day Sundays. Traffic: W1LP 218, OLQ 19, EMF 57, PTL 43, BX 33, BTH 31, OLQ 20, SEJ 14, VV

(Calculated on page 99)
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For latest Precision catalog describing quality electronic test instruments for all phases of modern radio-electronics—A.M., F.M., and t.c.v.

12, HXQ 11, AFT 10, EFR 6, JIS 6, QEK 6, SMQ 2, SUK 3.

EASTERN MASSACHUSETTS — SCM. Frank L. Bruce, W1ALF, Appointments it endorsed: ODC. Ayer, BHW Chelsea, JY National Guard Emergency Comm. Plan as EC; HIL as OPS; JY and TVZ as ORS; CTR as QSB. New appointments: TVZ to ORS, BWH to ODC. MD as OPS. Heard on 28 Mc.: LIB mobile, TJD, TEO, MJQ, QPH, VMD, UIL mobile, and UIE, KKT, GOU, KIC, KMR, VHH, and AHI. Is 174 Mc. VIK has TS850-D on 80 and also yesterday at 17 Mc. JW and KRR are on 3.8 Mc. K2EB, ex-KVQ, is on 3.8 Mc. and has a deal with ORQ. Seems to have the least amount of GBY. New officers of the Hingham Radio Club are BW, pres.; DMS, vice-pres.; ONY, sec.-treas. The Brookline Radio Club held a swap and auction. The Eastern Mass. Club had talks by Bill Holdrick and AOI. The South Shore Club held an FCC night with Mr. Hallenstein and an auction with KXY at it again, The Chatham Amateur Radio Asso. had a talk on Transmission Lines by KVQ, PYT, Ipswich EC, reports that they have a new e.d. director and a net with JOI, JYI, and HHQ. JDC is in on Berk's 9 Radio Club on c.d. set-up, along with IPZ. Attention all hams: The Eastern Mass. and South Shore Clubs have voted to put on the Boston Hamfest sometime in the fall. VVII has his General Class now. HWE is back on the air. WN1WMI is on the air with an SSB 4-575 on 80 and a rig on 2 meters. UTEF says they're on est. at 1830 on 7770. WAG, Taunton EC, is on 1500-1580 and 1800 on 40-meter c.w. BW is active on the telegraph and 3.5 Mc. SMG and NUP say conditions on 80 have been poor. LM is firing up the shack. IBS is active in nets and is a member of MARS. Restaurant owner will hold 2nd annual banquet in April. BB, busy on 160-meter DX tests, worked OH3NY and ZQ1XP. TVZ is building radio-controlled speed boat. SXII has rigged up a rack in the time. TVZ tried 40-meter c.w. WXG has a rig on 20, 40, and 80 and worked 23 states on 80-meter c.w. WN1WNR is getting a new General Class license. The Fred Radio Club held a meeting at HNQ's QTH in Peabody. VVZ has an SI04D and TS850D on the air. BB was heard on 1.8 Mc. by K2SR. W5K is the call of the Old Colony Amateur Radio Asso. in Foxboro. New officers are LNN, pres.; SE, vice-pres.; SUE, secy.; TQP, treas. The Club held an auction and had a Novice Open House with 35 people present. Anyone in that area needing help should contact SUE, in the monthly e.d. test the following towns were on the air: Somerville, Medford, Malden, Wakefield, and Reading in Sector 2 of Region 5. Also in Sector 5 Hingham, Weymouth, Quincy, Cohasset, Dedham, Randolph, Norwood, Milton, and Westwood were active. ADL were active in Region 5 at Mattapan. The Southeastern Mass. Amateur Radio Club of New Bedford had a talk by KLY on a rig he designed. WC6N has a vertical and antenna on 10. LAO's 400 watts gets out. UID is looking for a new antenna for 80. TZZ is on mobile on 10. IU is using 600 watts on 40-meter phone. LSS, the c.w. net, has a new phone some. QJ handled some messages from Canada with his 150. JYJ has been appointed as any of the Military Aide-de-Consul to Governor's. JZG has a call of: AEC 999. 000 at the old 2-meter DMW, MIB, HJF, BDU, OJR, DJM, NMC, M, QXU, GQ, LVA, BB, QCT, and many XYLs were on. DXCC has a Viking tube and 50's and KA is putting up 10-meter mobile rigs in their new car. ZQB has the PH. YVZ is the same. VVZ is new East Bridgewater EC. TIA: W1EMG 81, NUP 232, TVZ 210, ARN 253, ARN 14, BY 13, CTR 13, RDV 12, RSE 10, WU 10, BB 8, TNK 7, AGG 10, QJ 13, C.

WESTERN MASSACHUSETTS — SCM. Roger E. Corey, W1YJH — SEC, KUE, RM: BV, PAM: RDR. WMN meets at 7 P.M. Mon., through Fri. and W4MS at 8 P.M. Mon., Wed., and Fri. 3650 Mc. New officers of the Univ. of Mass. RC are UKF, pres.; RVT, vice-pres.; UIJF, treas.; VEB, pub. mgr.; TAY, secy. Region 9 ARC sponsored a v.h.f. night with HDW. T.R. in a crowd of over 100. STR has returned to our section from New Jersey. DRS is active on 50 Mc. LRQ and URR took part in the W4OM QSO Party. ERO, for those who are one of the section's most active members, now is working in Danielson, Conn., and is looking for a home there with good antenna possibilities. VNN has his General Class license. RJE, KUE, VS1, OH8, NLE, RRX, RRU, CF and CHU attended the annual v.h.f. set-together in Hartford. RNG excavated a two-week jaunt to Florida. TVZ is after 3.5 Mc. UVII, like most traffic men, has found that break-in is a must for efficient traffic work. BDV is experimenting with a multicircuit test instrument with parts which will check anything from modulation to key clicks. The high traffic totals of BVR and MGE are a result of the Greenfield High School's trip to W1EOC. Yes, they all sent messages home. CLX leads the section in countries worked. JYH has new crystal converters built for 6, 10, and 6 meters. OIU is getting into propagation observations. WEF has his General Class ticket and is already on 75-meter phone with ten watts of power. AF7VY has finished his dots and dabs with an automatic key. RDR and LBB are frequent Net.

(Continued on page 88)
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CASCADE Net on 29.2 Mc. is very active and steadily increasing. PRA reports he is consistently checking into three nets, OSN, OEN, and Cascade Net. AQN reports many club officers for Astoria as follows: JFK, pres.; BQG, vice-pres.; QYD, adj. pres.; WMM, secretary. Traffic: Feb. 7, 8, 9, 10, 11, 12. 6:15 AM, 7:00 AM, 8:15 AM, 9:00 AM, 10:00 AM, 11:00 AM, 12:00 PM, 1:00 PM, 2:00 PM, 3:00 PM, 4:00 PM, 5:00 PM, 6:00 PM, 7:00 PM, 8:00 PM, 9:00 PM, 10:00 PM, 11:00 PM. WASHINGTON — SCM, Laurence M. Sebring, W7CZV — SRC: BTV, RM. FIX: PAM, NRB. PGY is building an SWL transmitter. W3G has a 1 kw. a.m. notebook under construction. VI is using a converted ART-13. BG, RTQ, and PGY are doing fine jobs as NCS on the Sound Traffic Net. IGW is on 20 meters, but is finding many new TV sets in the neighborhood. GAT received his Advanced Class ticket a few days before they went out of style. RKU and HNA are active on W3Net. W3GG is planning to change to 3575 kc., average QNI for the month 15.85, and average traffic per session 9.9 messages. PPK works out on 40-meter phone OK, 14M worked well. His TCS-13 transmitter, NWP has a VFO and works better than with crystal. PVY checks into WSN and RN7 regularly. PFL worked PRR, IL7, and YX5 for the TBS-20D. CWN works in the garden. SXO-DIAAY has worked 87 countries in the past six months, using 32V-3 and "HF" from DYD, KGQ, RO, PDDQ, TCD, and BYK, and has a 6-meter net at 1930 daily. JFG is the new EC for Spokane County. GBU and EXA visited FFD and EXA. FFM is a better W3C, JRF got into the hot stuff at KHHV-TY and landed in the hospital. SBA, who is chairman of the Spokane TVI Committee, gave a talk over station KHHV about the anatomy of TVI. AHQ joined the Silent Keys. Traffic: Feb. 7, 8, 9, 10, 11, 12. FIX: P343, C6X 3241, PVY 202, KCU 180, BG 53, FRU 39, RTQ 94, AMG 27, EHH 12, OQ 16, QUO 17, NMT 14, ZU 11, NW 3, RDL 7, BLX 6, SKT 6, HNA 5, APF 5.

PACIFIC DIVISION

HAWAII — SCM, John R. Sanders, KH6RU — HARC continued to expand plans for the big Honolulu Convention scheduled for Aug. 15th. Plans are well along this time and the Honolulu Mobile Club QSO Contest was run by WARV/MA. KHORN/MW on the air. The newly-organized Windward Amateur Club meets in Kailua once a month. Active at the opening gun on 7-Mc. those were YL, OG, IJ, AGB, and RU. The Honolulu clubs turned out in force to assist with the civil defense mock trial and the drill "Eversharp II." AHQ, the Barbados Point Club, has a new 75A-3. W6UW/ILK traffics the mainland for the Service personnel at Kaneohe Air Station. KARA, 27, KAY 41, is building a n.a.b. rig. Try to get your reports to the SCM during the first week of the month. Most of them are reaching me too late for the publication deadline. Traffic: Feb. 7, 8, 9, 10, 11, 12. FIX: KATL7 831. (Jan.) KAKUS 1584. (Dec.) KATL7 1083.

NEVADA — SCM, Ray T. Warner, W7JU — SRC: HJ, EGK: KOA, IGS, NWU, NRU, OXX, TJJ, VO, and FP. OPS, TGU. Nevada State frequencies are 3600 and 7225 kc. The Las Vegas people keep their nightly party line going on ground-wave of 28.75 Mc. W7DQ is newly-appointed EC for White Pine County PCH of Elko, advices KOA is activated. PEW is a new ham in Elko. A flood of protest letters from hams poured on the Legislators in Carson City after a bill was introduced which would nullify our license-exam plate bill. Hams are electing their 40-meter "club" for activities on frequencies below 7225 kc. DQV, OBW, and JU are active on 2 meters. EJ has his new Viking II about ready for the smoke test. Nevada skeds for WAS continue to work out well, with K8Q working an FFS and V88 to make them WAS.

SANTA CLARA VALLEY — SCM, Roy T. Coulson, W7LZ — The main topic in February was the license plate bills before the Senate and the Assembly at Sacramento. Post cards and letters to your respective Senators and Assemblymen will go a long way in the minds of the legislators that we are doing a public service. DJ5 was a recent visitor at SYW's shack. SYW now is K7BYW. YHM's 4269 sideband is not7 all TVI kicks yet. He has had his TCO appointment confirmed by JINM. WMM had a great time in the CD. SXK introduced "I do" to QRM and is moving to New York. W5CH put up the antenna described in November QRA Ham Tips and it's working fine 80 through 16. HC reports in with high traffic volume and a couple days. MMG is working a little DX on the low end of 40 in the early morning hours. QIE has a pair of 4-65As fired up on 14 Mc. Antenna is a two extended half-wave in plate. QIE also has a new 6-meter rig. AMH now is active on 160- and 75-meter phone. DP5S now is active on 80- and 40-meter cw. QVR/DYQ is getting his transmit equipment wired. RAN is empty frozen orange juice cans, to build a 60-foot vertical. AIT has 40 watts on and handles a little traffic. The NPEIC had his guest speaker, Jim's Siwan Towers, at the FCC. At its second meeting the guest was Mr. John Rein- arks, K8RZ, from Elmae. The SCCARA had its guest speaker Mr. John P. Honey, head of Communications (Continued on page 108)
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Research Laboratory, Stanford University, who spoke on "The Good Side of Small-Scale Operation." Troops: (c) W8VMM 696, HC 10, MM 16, ART 3, W8AIT 12.

EAST BAY—SCM, Ray H. Cornell, W0ZJ—Am, SCM to: Guy Black, 9L6K; and Harry T. Cameron, 6RVC. SEC: WGM, RM: IFW, JOH, RVC and WGM have swapped jobs. Harry has been plagued with illness in the family for a couple of years. He has done a real job as SEC, Jay brings a lot of energy and experience to the ARRL. The GCRC is revising rules for the Field Day award. Pacific Division clubs who are not members may compete. Write to Z8S for details. SARA is a new member of GCRC. The Club had its first hidden transmitter hunt of the year in March, with UBM hiding the rig. The Skyriders Club met at NCI's OTH in February with a good turnout. NXL, PSL, HWV, MMX, and XA0 are new visitors. The Club's Net meets every Wed at 2000 on 28760 kHz with everyone, including you invited to QNI. H6X heads the TVI Committee for MARRA, and the new Field Day chairman, F. D. excels will be held on Mud Flat from Dutton's Landing. Z2F is communications manager for Valley Red Cross. KFI is planning an inclusion in 6-meter C.D. Net. WXU is on 75 and 20 meters from Sonoma. LIL holds new OPS appointment. Y7D renewed ORS appointment. JN8D apponted for 6-meter 'phone. So, Alameda Co. o.d. is holding regular drills every other Tues, evening with an ideal set-up but no equipment. If you can copy c.w. 20 w.p.m. on the air, you are available. JN8D is on 40 with T2F2D antenna. TT has the contest streak in his eyes again. FB is eying the DX Club trophy for high 'phone and c.w. scores. Among those heard at this time were 40-meter 'phones were LDD, TT, GHZ, and FYH. FYH scored 49,000 points in the 'phone DX contest but VVZ scored 52,000 points. FYH is the lead man on the TVI committee. TT has TVI on the run. FSV moved to new QTH. FWR is on the East Coast on business. NCC, now in Buckley, specialist on TVI, answered the draft call. JYV is attending College of S. F., BEB is active in Freeride Club, and the few DX fans around and the XYL enjoyed Yosemite trip in February. BMY beat out CTH at Mobible's Field Trial Feb. 22nd. KAG is mobile expert for FT & T. QT and KAG are making the most time to the snow country, according to the California State Highway Patrol. CX has printed a swell Mobiler's Wall Book. Bearcat: W5PFW 295, San Francisco.

SAN FRANCISCO—SCM, R. F. Cerkovski, W6AGO—JU 7-5547, SEC: 6NL, PL 5-8457, Eureka Area: EC: 8KB. Again this month GOV competitive, while KTV works 50-meter c.w. 8KB, FYY, BME, and SLX are busy with EC work. LIE has his 10-over-20 beam up, TEX has a Globe Scout running inverted to a folded dipole. J74A has a new antenna at his QTH. BJO has a quarter-wave for 80 (vertical). WN5APY has reached a Conditional Class and has ordered an Edcor TR1. JFD is building a tower and will soon get a new QTH. Vision is due in Eureka in October. The Humboldt Amateur Radio Club meets the 2nd and 4th Fri. in the YMCA rooms, Municipal Auditorium. "Miracle of Eureka. Marlin Area: EC: KNZ, Tamalpais Club EC: ZUB. Congratulations to the newly-elected officers of the Marin Radio Club, RRS, pres.: TJI, vice-pres.: EJ, Schloobaum, sec.; and RQT, treas. Attendance is increasing, and four new members have been added. The Club participated in the 30-10, an AUD-1 and BAR working with the local Corte Madera authorities. All are welcomed to the ARRC sun. mornings at 10300 on 200 kHz. The Marin Radio Club meets the second Fri. in the American Legion Hall, Larkspur. The Tamalpais Radio Club meets the 3rd Fri. at the home of OZC, 7 Loma Ave., Tiburon, San Francisco Area: EC: BYS, BIP, an ORS, has again moved back to San Francisco and resides at 726 Holyoke. Congratulations to N. C. for his new KN9ACN, EJF, Major Art Monies, USAF, reports from Germany that he is knocking off DX from Western German under the call DL4QX. The requirements is a 800-volt 530 vac. a 75A-2 receiver, and a "TV" antenna beam which, I quote, "of course, is oriented for San Francisco. The SFBRC had the pleasure of hearing an extremely fascinating talk by Mr. Lee of the Stanford Research Institute on "Minimizations, and Automatic Manufacturing of Printed Circuits and Components." The Federal Naval Shipyard Radio Club has provided an interesting history of the SFFN8TFC, from which the following highlights are taken: Organized in 1943, it is thought to be the first all-civilian radio club within the Naval establishment. CXX, the National Red Cross station, is licensed to this club, as well as SPT, which is actually located within the Navy Yard, on the 5th floor of Building 231. Complete facilities are in operation for teaching theory and code, as well as station operation, two nights each week, with BYS as head instructor. Membership is restricted to those who work in the Naval Shipyard. Equipment at SPT includes, in part, a BC-410, an ART-15, BC-641 and CTS

(Continued on page 104)
This is the life story of 3 of numerous Federal power triodes used by the Canadian Broadcasting Corporation at station CBX, Lacombe, Alberta: Since October, 1948, to recent date, these tubes have served for 69,000 hours. Both F-9C31's appear to have full emission and capability of many more hours. The F-9C29—used in modulator unit—is on standby after 21,015 hours.

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Cathodes of this type provide lower operating temperatures... keep components cooler, more durable. Because less filament power is consumed, tube life is longer... operating costs are lower. The power saved per-tube-per-year equals the price of a new tube!


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transmitters, super-pro and BC-342 receivers, and code training school facilities. The San Francisco Radio Club meets the 4th Fri. at Lakeshore Plaza, opposite 34th Av. and Sloat. The High-frequency Amateur Mobile Network meets the 2nd Fri. at the Red Cross Bldg., 1625 Van Ness Ave. Scale RC fees: EC, LOU. The SCRA meets the 1st Wed. in the Board of Supervisors Room, County Court House, Santa Rosa. Traffic: W6GQY 518, GCV, S2-9.

SACRAMENTO VALLEY — Acting SCM, Willie van de Kamp, W6CKY — New officers of the Mt. Shasta Amateur Radio Club are EKH, vice-pres.; W6N6QA, treas.; W6NSSP, secy.; HRF, ex-officio. ARR has been appointed EC. MTN will hold a round-up in Mt. Shasta, June 27-28, OOP. OOP members are officers of the Shasta Co. Radio Club of Redding are S6X, pres.; KTF, vice-pres.; OJB, secy-treas. AVZ has been appointed OPH, JDN is trying to obtain license. TST is building all-band portable. W6N6FG reports in traffic. W6JDN 25.

ROANOKE DIVISION

NORTH CAROLINA — SCM, J. J. Green, W4DLX — SGD, at Fuquay Springs, is all decked out with a new 78S. Collie receiver and reports he has worked 100 YLs for YLCC, but is sweating out confirmations on a few. YN, from Wrightsville Beach, is on 75 meters from new QTH. Congratulations to WGO and Ashe-ville, and CPH Brevard, and all the gang in the area for their work during the ice storm. The SCM would like to take this opportunity to express his appreciation of the subject of the new regulations. We have them and must learn to live with them. We amateurs of a greater number of years of experience and knowledge have a duty to point out to us, in our hobby, as in all other walks of life, cannot pass on to the coming generation what we have learned. We have failed to justify our very existence. Just building our very existence is not enough. We are providing the transmitter for them. They talk about us and little or nothing. By helping them to learn to use formulas and methods of arriving at the answers to their problems we will be giving them something to use to work out future problems. Help guide their minds with tools and construction methods and they can take pride in the fact that they did it themselves. It is just a little help. The sooner this is done, the quicker all signals and band conditions will improve for the enjoyment of all. Traffic: W4ARK 250, REH 1150, RJJ 70, EBU 42, SGD 30, DLX 20, QDA 6.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4AIAK — UTZ has a Viking 1 on 160 meters and is building a 250-watt. UFP has a Melsser 190B on from Charleston and works the 20-watt rig from school in Columbia. UEP has a Harvey-Wells TBS-50 on 160 meters. VIJ is acquiring a 10-meter beam. SVZ is working on putting 10 meters with his 4-20 with 35 watt input. WLI is a member of MARS. TTH is running 50 watt input on 20- and 75-meter ‘phone. FM finds reduced power is fun and eliminates his T9V. The Piedmont Amateur Club, Spartanburg, now is an ARR-l affiliated club. LNX is on 75 meters from Clemson. NTD is the new EC for Rock Hill and T9G is new Orangeburg EC. T9F is new Orangeburg EC. T9F is an Official Relay Station. 4DCE/KO6 now is KGOQAEP and is looking for the South Carolina gang on 14 Mc. and 7-Mc. ‘phone and c.w. from Union (Capt. Coe) and Florence, 3HII, has been transferred to Charleston. Cdr. Cook. 3X1VO, now is located in Charleston. Another attempt is being made under the old rubric to obtain South Carolina license plates. The increased outlets on the S. C. nets will provide better emergency preparation. Register your station for emergency use with your EC or the SEC. DX. Traffic: W4AIAK 775, FM 5.

VIRGINIA — SCM, H. Edgar Lindauer, W4F — We mourn the loss of TE to the fraternity of Silent Keys. For the first time in Virginia's history three stations SHJ, KLR, and JOT made 5W1 in one month and contributed more than half of the all-time total of 3414. The all-time total of 3414 is the "esprit de corps," the main and basic reason for these accomplishments has been amply expressed by SHJ and JOT, and we feel that "in passing through the past six months net results . . . Virginia has been leading in attendance in 4R since Aug. 1959; 4RN was 100 percent QN in EAN during Sep., and Dec. 1962 and again in Jan. '63. This is not too bad as it has been over a year since 4RN has maintained such a record."

Turnout of this section, in general, is poor. Local (c.w.) 45 high scores listed 8 Virginians. This is roughly 18 per cent. 'Phone contest reflected similar comparisons. 'Phone-enthusiasts-wise per ham capacity I doubt if any section can top us in DX, CD, or other contests QNI. We sure have a bang-up organization here and I'm proud to be a member of it." New members of VFN are SBY, T9VU, WVA 29, LNX, POB, and ZH. VFN now meets at 7 p.m. PARC officers are VEF, pres.; MT, vice-pres.; UGH, secy.; UM, treasurer. W4DNY, 8th at arms. VNF/1 is president of Mass. Inst. of Tech. Radio Club operating at WMXZ, also QNI from Leesburg. FYRC officers are NTX, pres.; JTG, vice-pres.; CJP, secy.; BWC, treas. ESR looks like the W/V/E.

(Continued on page 108)
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Covers 75, 40, 20, 15, 11-10 meters, and 19 and 40 meter bands. For use with any 1450 kc receiver. Supplied complete with tubes. Shpg. wt., 5 lbs. 84-913. Net. $52.50

Babcock MT-5A D-X Mitter
Deluxe mobile transmitter; 2 ranges, 3-7.3 mc, 14.0-30 mc; covers 80, 40, 20, 15, 11-10 meters. Choice of 4 crystals, 2 in each range. Easily modified for CW. 35 watts input with power supply below. Use with single-button carbon mikes. Requires 425 v. DC at 250 ma., 6 v. at 2.75 ma. With tubes; less crystal. Shpg. wt., 12 lbs. 98-791. Net. $99.95

PP-4A Mobile Power Supply
Operates from 6 v. DC. Shpg. wt., 15 lbs. 98-792. Net. $67.50

LS-1 2-Band Antenna Tuner
Use with 8-ft. whip. Easily pre-tuned for 10 and 75 meters. Built-in by, also selects proper section of tuning unit. Shpg. wt., 7 lbs. 98-793. Net. $15.00

RME MC-55 Converter

RME MC-53 Converter
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Elmac A54 Xmitter
For mobile or fixed station. Up to 60 watts input, phone or CW. For 80, 75, 40, 20, 15 and 11-10 meters. VFO and Pierce crystal osc. Requires 6 v. at 4.5 ma, 500 v. DC at 25 ma. With tubes; less crystals and mike. Wt., 17/4 lbs. 98-0078. For carbon mike. Net. $143.00 Model A54H. As above, but for use with crystal or carbon mike. 98-0088. Net. $153.00

PSA-500 Power Supply
Delivers 375 v. DC at 250 ma. 6.3 v. AC at 5 amps. For 115 v. 60c. AC, 15 lbs. 98-0086. $39.80

Mobile Viking Mobile Kit
Up to 60 watts input on 75, 20 and 10 meters. Complete handwinding; grid tuning; 4-position crystal selector. Contact your dealer. Shpg. wt., 5 lbs. 98-0056. Net. $99.50

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West Virginia. SCM, John T. Steele, W8MCR, 3AAK visited with GEC and EVR. CGC, FQK, KQJ, ZAG, GEC, and EVR met with members of the State Legislature trying to get support for a bill to authorize issuance of call letter licenses. R. R. Derr—President of the club—went into committee but the amateurs were advised they have to purchase their own stations. All interested got in touch with EVR at Bella, W. Va., YPR our SCM, advised that complete copies of the proposed act, plan for our State will be mailed to any individuals or clubs who send him their addresses. FQK worked 32 countries and WAG on 80 meters c.w. In 824 weeks. He got TASA for his Asian contact. HZA also reports a nice batch of DX on 80 meters. GEC has his new rig going on c.w. with a brand-new Sanko VFO in the front end. VCA is rebuilding. ETF is bury chasing Indians. The traffic total for the "phone net was 112." For the c.w. net 22. Traffic: W8UJ 861, HZA 40, GEC 32, ETF 26, DFO 12, GGC 8.

Rocky Mountain Division

Colorado—SCM, Karl Brueggeman, WB6CDX—SEC; KHQ. The Darnet has had some very nice drils in the last month using the new 2-meter portable equipment. The Net still needs operators and since Nvicians can operate the 2-meter equipment, it would be good experience in case of an emergency. KHQ had a lot of trouble with his rig and finally found the cause. It was a couple of faulty connections. HH. Don't forget the Rocky Mountain QSO Party that will take place on May 16th and 17th. CYP has a new TVI complaint. KYD has a new VFO, a new Gilson Champion 1G2 on 10 and 160 meters. RCU, temporary chairman of the Colorado Springs TVI Committee, is the subject of two TVI complaints. EVN has a new s.i.b.h. on 10 meters. CYP discussed the antenna scope and antenna problems at the El Paso Radio Club meeting in February. LCE finally got his new 100-meter antenna working. WLN is president of the Denver Radio Club replacing IC, who resigned to become our Rocky Mountain Director. Congratulations.

(Continued on page 108)
HARVEY HAS THE MOST COMPLETE STOCK OF MOBILE GEAR

PORTABLE MOBILE RECEIVER

A complete 10-tube dual conversion, communications receiver. Provides coverage of 6 bands from 10 to 80 meters as well as broadcast and 160 meter band.

Dimensions: 4½" high, 6" wide, 8½" deep.

Weight: 6½ lbs.

Complete with tubes .................................. $134.50
(less power supply)

ELMAC A54

UNDER-DASH MOBILE XMTR.

Measures: 7½" x 7½" x 12".

Weights: 14½ lbs.

Covers 10, 20, 40, and 75 meter bands.

For Carbon Mike Inlet .................................. $139.00

For Dynamic or Crystal Mike .......................... $149.00

Power Supply, 110 volts AC ............................ 39.50

SONAR MODEL SRT-120 TRANSMITTER

For mobile and fixed location operation. Has band-switch for 80, 75, 40, 20, 15, 10 and 11 meters, plus spare position for any future band. Has provision for two crystals or external VFO head. Final amplifier employs the new Ampexor 9902/2984A tube. Power input is 120 watts on CW, and 100 watts on phone. All circuits metered. Power requirements: 600 watts dc at 350 ma, and 6.3 volts at 6. A.

Complete with Tubes .................................. $198.50

External VFO Head .................................... 19.50

SONAR MR-4 Receiver .................................. $89.95

GONSET "SUPER 6"

SIX BAND AMATEUR CONVERTER

A compact converter covering 10, 11, 15, 20, 40, and 75 meter phone bands. Also covers 6 mc. (49 meter) and 15 mc. (19 meter) short wave broadcast bands. Uses 6C68 low noise rf stage, with panel controlled antenna trimmer, 6A16 triode mixer, 6C4 modified Clapp oscillator, and 6816 IF stage.

Complete with Tubes .................................. $55.50

COMMUNICATOR

A complete two-way station for 2 meter band operation. Suitable for mobile or fixed location use. Receiver is a sensitive superhet with built-in noise clipper circuit and 6BQ7 Cascade rf stage. Transmitter uses 2E26 in final 15 watts input. Employs 8 mc. crystals for stability, and has a range of over 100 miles. Operates on either 110 volts AC or 6 volts DC. Weight approx. 16 pounds.

(Complete with Tubes (less crystal and microphone) .................................. $199.50

Also available for commercial or airport Unicom applications.

With crystal .................................. $299.50

FOR YOUR SPECIAL NEEDS

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SINGLE SIDEBAND EQUIPMENT

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All makes and types

TRANISTORS, GERMANIUM DIODES, SUBMINIATURE TUBES

ETC.

SPRAGUE NON-INDUCTIVE RESISTORS

For Rhombic Antenna Termination, and other applications.

CAMBRIDGE THERMIONIC COILS

Brand New Model 425

WESTON RF AMMETER

3½ dial, non-glare glass.

Range: From 0 to 2.5 mgs.

Special ............................................. $8.95

HARVEY SPECIAL

#7 Stranded Wire

Heavy Duty Rubber Covered - Tinned. Ideal for Hooking Up Mobile Supplies. 50-foot lengths: .......................... each $4.95

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.

The New Model MC-55

RME MOBILE CONVERTER

Covers all ham bands from 10 through 80 meters in five ranges. Sensitivity on all bands is 1.25 microvolts. Operates with antenna Input Impedance of either 50 or 72 ohms. Separate Input connector permits use of regular antenna when control knob is in position for broadcast reception. Requires only 150-180 volts at 25 ma. Four tuned circuits in f.l. output stage provides high signal-to-noise ratio. Output frequency is 1500 Kc.

Complete with Tubes (less power supply) .................. $69.50

MORROW CONVERTERS

The Latest in Mobile Converter ... Easy to operate . . . . Study construction for long, trouble-free service.

Model 58R

For 10, 11, 15, 20, 40, 75, and 80 meters. .......................... $74.95

Model 38R

For 10, 20, and 75 meters .................................. $64.95

The New VFO for your Harvey-Wells Bandmaster

Fully efficient on all bands occupies no extra space. .......................... $47.50

HARVEY-WELLS Bandmaster Model TB550

Senior Model .................................. $111.50

Deluxe Model .................................. 137.50

G.E. Automatic VOLTAGE STABILIZER

SPECIAL .......................... $8.95

Provides constant 115-volt output with an input variation of from 95 to 120 volts. Stabilization is held within 1%. Rating is 30 VA, 60 cycles.

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103 W. 43rd St., New York 36, N. Y. - LUXemberg 2-1500
The new, outstanding
Two meter Receivers

The ideal receiver for amateur, Civil Defense, Civil Air Patrol!

A precisely constructed superheterodyne receiver designed for reception of AM signals and having outstanding performance capabilities. Strongly built to withstand vibration ... compact for convenient mobile mounting. Highest quality components ... conservative ratings.

RANGE: 143-149 megacycles. Tunable*....
TWO, PRE-RF STAGES. (6AK5's)........
HIGH SENSITIVITY—IMAGE REJECTION
EXCELLENT SIGNAL-TO-NOISE RATIO
TWO, I.F. STAGES—6 TUNED CIRCUITS
SHUNT-TYPE NOISE LIMITER
ANTENNA TRIMMER ON FRONT PANEL
VOLTAGE REGULATION ON OSCILLATOR
7 TUBES PLUS 082 VOLTAGE REGULATOR....

*Crystal-controlled, fixed frequency models also available.

Net $99.50

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50 DRUMM ST. SAN FRANCISCO, CALIF.

ROCKY MOUNTAIN DIVISION QSO PARTY
All amateurs in the Rocky Mountain Division and surrounding states are cordially invited to participate in the First Annual QSO Party for the purpose of meeting and renewing acquaintances and in publicizing the Division convention to be held at Elk Horn Lodge, Estes Park, Colorado, June 20 and 21, 1953.

Rules: 1. Time and dates: Begins 0800 MST May 16th; ends 2300 MST May 17, 1953. 2. Where: All bands. Suggested gathering places: CW: 5690-5710; 7770-7800 kHz. Phone: 3890-3900 kHz. 3. General call: C.W. "QSO RMD"; Phone, "QSO Rocky Mountain Division." 4. Contacts permitted: You may work for credit the same station once on each amateur band, i.e. one contact—credit will be given for a QSO anywhere in the band 3500-4000 kHz, either phone or c.w., and one contact—credit for QSO in the band 7000-7300 kHz. No cross-band QSOs will be counted. 5. Exchange: Each party to a contact will give his name, location and whether registered at the convention. 6. Reports: Logs must show time, date of QSO, call of station worked and information received. Total your score, give your name, location and whether registered at convention, and mail to your SCM (see page 6 of this QST for address) postmarked not later than May 24, 1953. 8. Prizes: First, free de luxe treatment at convention for one person, registration, meals and room with bath; second, free registration and meals for one person; third, free registration for one person.

SOUTHEASTERN DIVISION
ALABAMA — SCM, Dr. Arthur W. Woods, W4GW — TWR, reports that in Huntsville LITE, NIKX, BPL4, and QSO/4 are mobile on 75 meters. Huntsville phones, frequency 3808 kHz, NIKX has received OBS appointment.

DAK, answers AEIU regularly using a Command transmitter but is building a 150-watt rig. May 14th is the date TWR, reports that in Huntsville LITE, Alaa, G5Z has new 500-watt and NC-1830D, VGC, AXE, and QSO/4 on the air. In Oneonta, WOF and TK1 are on 144 MHz. In Huntville, WAT has new 350-watt rig. VDK and VDL, who are usually handicapped, operate a ham-funk using a Viking and a 183D. UCR claims to have an all-band 100-watt mobile rig. The Birmingham Mobile Emergency Net continues strong and is relieved of any city hall problem by the new 100-watt rig at TRM in the City Hall with a ground plane atop the pentagonal structure. WSE reports a new BPL4 of TK1 and comments when one station moved from Channel 4 to Channel 8, GJW has now Super Six working in a Motorola 769 in a '51. WEN reports that in Huntsville.

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FHZ / — February was a month of big traffic but few reports were received from the gang. The first CDC meeting was held for three days in Jacksonville on communications. RACES was taken apart by FWZ for the purpose of getting the idea over to use the ICAs as Radio Officers. BPL for February was made by our regulars, DOR and FDU. If you haven't sent me information on your CDC connections, please do so. Daytona: HWM was appointed head of local civil defense. Jacksonville: UHY is getting an e.d. field rig building program under way a la Detroit.

(Continued on page 110)
RADIO SHACK IS READY FOR UHF ... are you?

PROVEN IN USE!

NEW!
For UHF
Amphenol BO-TY Antenna

New uni-directional ALL-CHANNEL UHF antenna provides high gain on all the UHF channels. Designed by the same reliable Amphenol engineers who originated the famous Inline VHF antenna. Sturdy screen reflector improves directivity and overcomes multi-path reflections. Easily installed; may be stacked for additional gain in fringe areas. List $7.75.
Order No. 29-062Q .................................. Net price $4.56
Amphenol TUBULAR twinlead — best for UHF!
Order No. 30-356Q ....... 100 ft. .................................. $4.88

PUSH-BUTTON PAINTS!
WITH SUPERIOR INSULATING CHARACTERISTICS

16-3070 CLEAR PLASTIC
16-3050 CHROME ALUMINUM
16-3060 GOLD LEAF
16-301Q CHINESE RED
16-303Q ROYAL BLUE
16-3020 BRIGHT GREEN
16-3040 LEMON YELLOW
16-308Q PURE BLACK
16-300Q PURE WHITE
16-309Q PURE GRAY

PLASTIC OR ALUMINUM $1.11
ENAMELS $1.23

Spray painting at its best and cheapest! No brushes, mixing or messy storage problems. Perfect for chassis, antennas, shack, shops, all home uses! Each can has built-in mixer. Just shake and spray! Test laboratory found this superior to other famous brands in insulating characteristics! Immediate delivery! Please order by number.

AMAZING SOLENOID-OPERATED MULTI-WAFAER SWITCH FOR REMOTE CONTROL!

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PARTICULARLY APPLICABLE TO MOBILE EQUIPMENT

6V DC multi-circuit wafer switch literally obsoletes manual switching. Either stepping or rotary selective action. Control wafer A, B, C and D are 1 pole 6 position; wafer D is DPST. Resistance ½ ohm. DC 25 degree rotary stroke requires 6V DC @ 10 A for .03 sec. 4½ x 2½ x 2½". Shipping wt. 1 lb. Pictorial schematics included.
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WHEN ORDERING, enclose enough to cover postage. Any overpayment will be promptly refunded. COD orders (minimum $4.00) must include 20% down payment.

MALLORY UHF CONVERTER

Field tested and approved by experts as the ONE converter for VHF-TV sets that’s really first rate. No complicated wiring — plug in power line and antenna leads and you’re ready for UHF without disturbing your present VHF-TV reception. One knob tuning with the incomparable Mallory Inductuner. Mahogany plastic cabinet 9 x 7 x 6½". Ship wt. 7½ lbs. List price $42.95. WE ARE DELIVERING NOW!
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Astatic BT-1 TV-FM BOOSTER
and 80er-type 2 meter PRESELECTOR!

Brand new, in factory sealed cartons, the BT-1 carries a $29.95 list price. Tops for TV and FM, it also makes a fine preselector for the amateur 2 meter band and all transport, marine, air, taxi, gov’t stations within its continuous tuning range of 52-216 mcs. Built-in power supply, Mallory inductuner, 6AK5 tube. Either 72 or 300 ohms in and out. 4½ x 6½ x 4½". Ship wt. 5 lbs.
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**It's Engineered for TOP PERFORMANCE**

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COLLINS 32V-3 XMT
Compact, VFO controlled, gang-tuned unit with complete band-switching. 120 watts input on CW, 120 watts on phone. Covers all ham bands; 80 thru 10 meters. Permeability tuned circuits. Added TVI suppression features. The most wanted of all medium power xmt's!
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Featuring sensational new Collins mechanical IF filter. Gives a practically straight-line, flat-topped selectivity curve! Plug-in provision for two mechanical filters. 3 kc filter standard equipment. 800-cycle plug-in unit available as optional accessory for greater selectivity on CW. Double conversion superhet covers 160 thru 10 meter bands. Accurately calibrated directly in 1/10 mc. Here's a natural for your 3 for the type of operator without a speaker. In Stock! $550.00
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Give Your Beam a Chance
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- Galvanized Steel
- Easy to Erect
- Strong, Safe Ladders

These sturdy, heavy gauge towers, are precision manufactured by Missouri Rolling Mills, and designed to withstand winds of 70 miles an hour on the tower and a thrust of 800 lbs. on the top. They are self-supporting — no expensive foundation or unsightly guy wires necessary. Only three holes filled with broken rock and concrete are required. Anyone can make the installation.

Stronger . . . More Durable Design
Corner posts are a special 60° channel for extra rigidity and strength. It's stronger than any angle section of the same weight. The upper leg member is formed with a special die instead of merely lapping the legs and bolting. This method of construction keeps the line of the tower straight, placing all bolt holes properly on the same gage line and securing sufficient metal between bolt holes and edge of the leg.

All towers supplied complete with anchor posts, section bolts and lock washers, plus set of instructions for installation.

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SOUTHWESTERN DIVISION

LOS ANGELES — Acting SCM, Howard C. Bellman, W6YVJ, has on the agenda a meeting to be held at the OSCC. There will be a deep sense of gratitude to the many people who have attended these meetings and we are looking forward to more.

LAUSANNE — The Radio Amateur Club is having its first meeting of the year on Saturday, May 11, at 7:30 p.m. at the club headquarters. There will be a discussion on the latest developments in Radio Communication.

SOUTHAMPTON — The Southampton Amateur Radio Club is holding a meeting on Thursday, May 9, at 7:30 p.m. at the club headquarters. The topic will be "The History of Radio Communication".

WILMINGTON — The Wilmington Amateur Radio Club is holding a meeting on Tuesday, May 7, at 7:30 p.m. at the club headquarters. The topic will be "The Use of Radio in War and Peace".

SAN DIEGO — The San Diego Amateur Radio Club is holding a meeting on Monday, May 6, at 7:30 p.m. at the club headquarters. The topic will be "The Use of Radio in Scientific Research".

Write or Phone for Complete Information

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THE WRL GLOBE SCOUT
(50 WATTS PHONE — CW)

The WRL GLOBE SCOUT is the latest triumph of the WRL engineering staff. It is a beautiful, compact XMTX, completely self-contained, including power supply — 811 X 14J/7, X 85/D. Contains new 6146 tube in final; covers 160M thru 10M. Metering provided for final grid and final plate circuits. Complete kit includes all parts, chassis, panel, power supply, cabinet, tubes, meter and one set of coils. Can be used for mobile work with suitable power supply. (Auxiliary socket provided.) An ideal XMTX for the novice or the experienced ham.

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NEW WRL 400-WATTS Phone-CW GLOBE KING XMTR

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KIT FORM WIRED-TESTED
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5 YEARS OLD AND STILL GOING STRONG!

Writes Marie C. Martin, WH6AQK

"I received my call WH6AQK in July '52 and never had a chance to go on the air before departing for Anchorage, Alaska, where we'll put in three years before returning to KH6 land. As you can see we have a "GLOBE KING" of old vintage, but boy the way it gets out just can't be beat.

We've had it for over five years with never a bit of trouble."

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NEW 165 WATT GLOBE CHAMPION XMTR

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Club, who gave an FB talk on remote control. A speedy recovery to JAN, more power to Aetl, ECQ, GBM, and OZO, combining their best c.d. efforts with JTI, Drill frequency up in Orange County paid off for DEY when he was involved in a four-car collision; AEX came to the rescue. That's mobilizing in action! TIK will raise both eliches and rhombics. An FB ARRL TVI film was shown at the last PRC meeting held in Chula Vista attended by 28, including Ben, of IAB. The guest at IAC is planning a big dance at the school; GBM is going West on General Class c.w. test coming up on QSN is lost to his hair from studying the 2nd-class phone elements; the follow-up YL WAYSS is possibly the life out of 4702 kc. at IAC, GBY worked in the DX Contest, BAM on 21 Mc. The 75-meter San Diego AECO Net roll call is running to 6o, check-ins now; JPM, in Fallbrook, is checking in the northern area. San Diego mobile held a Sunday morning breakfast with AD as an honored guest. From SK we heard that during the recent test IS was alerted and mobilized in the San Diego Area; NJB sparked the call, assisted by EWI and WYA. SK coordinated on 75 in the Oliver Mert drill. All are well and had fun at the Pacific Club gathering. Traffic: (Feb.) W1AHJ 4323, YDK 478, IZC 201, EIZQ 168, MUE 100, FCT 19, CHY 5, IAC 5. (Jan.) W6DKY 497. (Dec.) W6EIQ 499.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, William J. Gentry, W3GVP — Aetl-SCM: Thomas B. Craig, SJ5D. SEC: QTH. RM: BKH, PAM: IOW. RTM lost a finger. Sorry to hear this. WIG worked his first XE. UZM is the proud owner of a new HU-129X. BRK informs us he is busy painting but still has time for traffic, KSPNC. On the air 1430 during week days, needs some more traffic. AWT is trying to work 40-meter phone. The South Plains Amateur Radio Club has elected the following officers: Pres.: W3JQ; V-prs.; W3QG, secy.; W3RR, trea.; W3GQ, chair. of TVI, W3DPX handled 6 messages which your QCM overlooked reporting in the totals. 540 is sporting a new Buick bumber plus a de luxe ham shack. Did you say you had an oil well? We would appreciate hearing from more of the amateurs. Let’s have your activity reports. Traffic: W3HHJ 358. QTH 350, PAK 295, VRY 49, CF 44, K5NRG 38, WSPX 26, SRF 30, HBD 20, JQA 19, UZM 19, ARK 9, ROH 9, VFT 9.

OKLAHOMA — SCM, Jesse M. Langford, W3GWV — Aetl-SCM: AGM, RM: MQL, PAM: SBR and ROJ, AZQ, KXH, and EHC are in the planning stage for single side-band. 7BQ is operating mobile from Tinker AFB. RDI is building a modulator to a code-follow-up that is working on new exciters. TFP has been designated EC for 40-meter phone in Oklahoma County. IKN will be back on the air soon with a pair of 8076s. The Beckham County gang has organized and has named the new club the Northfork Radio Club. Officers are PRB, ULW, and DGR. The Sand Springs Club now is affiliated with ARL. TNY is Advanced Class. A new amateur in Sand Springs is TNU, Ill is engaged in the de-tying the rig. MFC is running kingdom. The Lawton-Ft. Sill Club had its annual dinner Feb. 15th with an excellent program and plenty of prizes. Civil defense certificates were given to the Lawton-Ft. Sill Emergency Corps members. UCT is operating 50- and 40-meter c.w. The car tag license-plate bill took a setback but it looks like Bill Humphries and the Oklahoma City gang might salvage something out of it. GRO has been the wheelhorse for the license tag bill the last two years and has done a grand job. Director Middleton’s newsletter has been received and Mtd is to be congratulated on getting into this Division in such fine shape the information that has long been needed. Send in applications for OHS or OAPS appointment if you qualify. ORH and GND are new OOs, NGE, ITP, and TKS are new OHS. Traffic: (Feb.) W3OZX 167, SWO 162, ROJ 147, ARK 104, MQL 90, MF5 63, FA 60, ORH 55, KY 53, QAC 50, QAC 49, QAC 49, QAC 49, QAC 49, QAC 49, QAC 49, QAC 49, QAC 49. (Cont.)

SOUTHERN TEXAS — SCM, Dr. Charles Ferganli, W3SFJ — KIP has been reflected SCM and is building a new rig, 1Z. H. Nix landed a hard knock but is completely TVI-proofing the rig and it is putting it on all bands. He is active on CERN and HEM. MN seems to be working harder than ever—he's heard in a report every month. Sure wish some of the rest of you would send in some dope. WN5WJX reports that there is lots of activity on 160 meters down his way and mentions the fellows below to GCAR. They are BD, BGR, BVR, NSB, OGG, PTV, TOM, TRE, UEX, UBY, VUS, and WVF. UN6 was using W6F's Viking so he was on the air with the HCAR. Some reports some hams in Texas City are WY, YJL, WN5WJ, WNBW, and WN5X5X. YQX is home in Lafayette, LA. JUG, TON, NUI, YLY, and YVI are 15 years old. YB are 14. SAH, San Antonio, has entered the U. of Texas where he is majoring in electrical engineering. UMY has moved to a new QTH and has organized the San Antonio section. No reports for the Brazoria County ARC. The 3C8ARC is working on ARRL affiliation. UN5 is active in AF MARS, STEN, STX, and KN. K5 RPC made 1725 ham contacts and 523 MARS contacts in February. RGF called (Continued on page 118)
UNBELIEVABLE Price!
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NEW YORK, N.Y.—According to Mr. R. J. Matthia, W6V1W, for several years the amateurs in the State of New Mexico have been trying to get legislation passed for call-list license plates. The bill has passed both Houses of the State Legislature and now needs only the signature of the Governor of the State to make it law. Many amateurs in New Mexico deserve credit and we are especially grateful to MYI, KCO, Francis Cloument, and other members of the Santa Fe Radio Club for the assistance they rendered in making personal contacts with members of the State Legislature in our behalf and for handling the hundreds of messages from the amateurs in the State to the Senators and Representatives. The result of all this is that Amateur State Picnic is now tentatively set for the week end of May 24th. It will be held in Roswell. We understand the Pea Valley Radio Club has made many interesting plans for this affair that it promises to be one we cannot afford to miss.

CANADA

MARITIME—SCM, A. M. Crowell, VE1IQ — QSL: FQ, EC: EK, RM: OM. FQ did quite well in the DX Contest. DG has completed the Clapp VFO/1.m. unit and has it up 14 Mc. Phone, HARC Activities Committee for this coming year consists of RY, chairman, DB, WD, LY, and L2. Both KD and EG have been on 420 Mc. ET has been working the Halifax gang from the north-eastern QTH of the country. LY, new OPS, has been quite active on the Maritime Phone Net. Glad to hear EK is recuperating and will be on soon. LT is on 28 Mc. SG, new OPS, has been active in the DX Contest. OM has been giving DB some tips on the finer points of phone operation. Conditions on 5.8 Mc. have been quite fair with the Maritime Net. Long skip and VE2 QRM have been giving some trouble. We wish the above who work close to sea would try to cooperate enough to cooperate so that QRN would be avoided. CQ DX contest was a new jr. operator. Traffic (Feb., VE2FQ 23) VOGU 04, VE1LY 57, VOIB 04, VE1OM 43, VOBN 23, VOB 09, V0E 7, VOAS 7, VE2D 2, (Jan.) VOGU 46.

ONTARIO—SCM, G. Eric Farquhar, VE5IA—Hobby fairs in Toronto and Hamilton provided much material for the high traffic totals of the section this month. It is with pride that we announce the issuance of a BPL certificate to the Northtown Radio Club of Toronto. Through the column NG, the Club's activities are now kept before the yeast's president, extends deep thanks to the OSN, MLN, QON, and TXN nets, and all who assist in moving traffic from the International Hobby Fair held in Toronto. DGZ now works with a newly-assigned call. AUU is now Belleville RC. Welcome to the Dryden Radio Club as an ARRL affiliate. DOC uses walkie-talkie with success in the RFO. The Hamilton Emergency Corps received fine mention in the Red Cross annual report. BSW, now class A, received 20-w.p.m. endorsement ticket. Members of the Mohawk and Hamilton Clubs conducted emergency practice in the field. May we suggest you watch the Hamfest Net on 3750 kc. Sun. at 0900 for up-to-the-minute news. The Hamilton Hamfest is to be held June 8th. The Hamilton Club, under the call DXC, in official holder of the Marconi Company trophy. Presentation was made by Mr. Finlay on behalf of the donor, who brought a message of greetings from the company's president. DXC held up work at the QTH of EAB on slot antenna on 144 Mc. BUR is up a nice traffic total despite QRL business. VGK has fun with five wails. AVS is rebuilding his shack trying to get on the air. Nevada, DGW now is an RCO member. AZH and BTG are newly-appointed ECs of Picton and Trenton, respectively. BZM now is stationed at Port Nelson, looking for contacts from his section on 7160 kc. TRAFFIC (Feb.) VESBRR 627, ATR 245, BIV 223, BUR 197, IA 155, AEU 149, EAU 177, WY 304, VE2D 49, DOG 44, KM 44, ADJ 38, AUEU 14, DQA 6, BSF 4, VD 4, DPC 2, SC 2. (Jan.) VESBRR 25, PH 6, DOC 1. (Dec.) VESBRR 23, DOC 6.

QUEBEC—SCM, Gordon A. Lynn, VE2GL—AKJ is operating portable W1 from Springfield, Mass., and is looking for VE2 contacts. The Montreal Amateur Radio Club held elections and AGF is a new president, with XZ vice-president. AGF has RTTY receiving set-up operating now and is concentrating on the transmission end. AKJ has had 40-meter RTTY QSOs. B.S. still sends most

(Continued on page 118)
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of his available time getting rid of TVI but manages to handle a little traffic. LU and DQ are back on the air after long lay-overs, DR has been appointed AEM, EC of Poc-Ha, and the Claire and skeds PQN, TRN, and QEN, as well as a score of SM stations on 20 meters each Sat., morning. Phyl. the XYL of CA, has returned home from the hospital, where she has been since the middle of February, but will be convalescing for several weeks before resuming ham radio.

EC manages to keep Timo River and the air with skeds to AEM, AGF, AGH, AOB, and ASP on 3.5 Mc., and VE and QG on 144 Mc. It is requested that club secretaries or others interested send me the name of their club members with the mailing addresses. It’s all has been changed to 0R. It is again necessary to request that reports be sent in order that this column may appear.

Traffic: VE6DD 45, CA 21, G1, L1, BK 3.

ALBERTA — SCM, Sydney T. Jones, VE6QJ and GW now have their Class A ‘phone. PC has purchased a mike and will be on ‘phone real soon using n.f.m. ZA has chucked up several good contacts in the 7 Mc. Congratulations to FB and his XYL on the arrival of a daughter. It is heard that WO is building a real FB rig. SN is going plant modulation. KY has acquired a new test gear. EP is building a new frequency meter. LI is active on the net again. HX has completed an n.f.m. unit and is active on 3.5- and 7-Mc. phones. YZ is holding forth on Trunk Line "T" but reports conditions have been poor. WC reports the same on the Maple Leaf Net. We are sorry to report that ZA has confined his hospital but sincerely hope that by the time this report is in print Roy will be very much improved. CP is going for a little more power by the local of the power supply equipment acquired. ZA, who has a set of the DX Contest but found conditions very poor, NA visited Edmonton in connection with the Broadcast Engineers’ Convention.


BRITISH COLUMBIA — SCM, Bill Moorhouse, VE7US — The BCARA is after license plates through the Government M.R.A. Some discussion has been raised re a Wireless Canadian Director, also a Canadian ARRL. The League position of many years for an independent separate organization but when of demonstrated strength and established finances, however, this writer suggests that we cannot and should not support a separate Canadian organization at its attendant costs. Politically the two as one can do more for Canadian hams. Via: CAROA, AFARS, Novice, etc., present no problems (QRM) to anyone used to working 20, etc. QV is rebuilding. JB and LP are too busy with TV. CG is doing a good job of ARB net management. AMJ becomes EC for District 1 with AA as EC for District 7, replacing JB and AIJ. DH reports from Nanaimo. HF is mobile with respect to QRM. US is mobile with original gear. ALL has gone TV. TT and UIW also are active on 75. BF installed 40-meter ground-plane vertical. DH may go higher power. AW1S puts out the usual strong signal. PO is busy man in Victoria. Other Victoria stations are XZ, KA7, AAZ, CB, CM, ME, WL, BB, M1, A1H, (H), ZM and ZA are on the air. AK, and AAVZ visited Nanaimo separately. 20-meter groups still are going strong but some of these have actually improved on 75. TVL is taking time out but a gander will find those resonant circuits. If there are no resonances in the TV spectrum then there is very little trouble even without shielding. TVL is now in Victoria. ZR, A1J, FF, CO, AFC, and DB were heard during February.

Traffic: (Feb.) VETOC 140, DH 12, (Jan.) VETDH 9, CX 5, AOB 4, A1K 2.

MANITOBA — Acting SCM, Leonard E. Cuff, VE4LC — On behalf of all the hams in this section we extend the very heartfelt of congratulations to Jimmie Watt, who has achieved his great ambition against terrific odds, and is a fully licenced ham with the call VJ. AI is using 30-MF1 in the final. RO has WAC and worked 61 countries on 21 Mc. CI is sporting new Pontiac. HL has new GDU, electronic key, and D-104 mike. CI is active again after a long lay-off, using 810 final with n.f.m., and logarithmic compressor. AV, of Lauder, can now be heard on 3759 ke. DL is busy these days running 12 watts s.s.a.o. on 20 meters. To the best of our knowledge there is the first in this district to be active with single sideband. AZ of Roland, can be heard from BD's QTH in Wasagama. AV has new Gonset Commander. BI is building an electronic key. CI has acquired SX-12 receiver and expects to be active on 20 meters. SO1, ex-CB, is now at Mason, Sask. WS has new 350-watt all-band transmitter. KN and OM, Lec. were recent visitors at the QTH of JQ and GV in Minnedosa. EI has licked his BOI problem and is now using n.f.m. SR may be heard consistently with his 100-watt mobile for 20 and 75 meters. My thanks to KN of the BARC for the forwarding of many of the above items. How about some news items from the rest of you? Traffic: VE8BB 110, CB B 2, KN 3, MX 2, KD 7.

SASKATCHEWAN — SCM, Harold R. Horn, VE8HR — February 9th saw 24 hams gather at Tisdale for a banquet meeting. FS and IC were in charge. The Annual Saskatchewana Manifest was to be held in late May. Lake Waskateu was discussed along with other matters, including ARRL, ARD, SARD, and working conditions on the nets.

Traffic: VR, FY, and GR from Saskatoon, SN, MM, and MQ from (Continued on page 180)
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Low noise, 1 microvolt gives 20 db quieting, high sensitivity 0.11 microvolt per microvolt signal 6 db over noise level. The ultimate for top performance. For power supply of 150 to 250 volts required.
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Prince Albert, along with closer points, made it a worthwhile affair. EQ and his XYL have left for VE3-Tand. CE with a son and MQ with a daughter are to be congratulated. TE will be heard on s.s.b. soon. VB has our best wishes for a speedy recovery after a serious accident with a road grader. FG, as GO, reports fine cooperation from those he has contacted with faults. Your rectification and help will make for better signals on the bands and make the position of OO a happy one. EQ reports that AREC is slow and he would appreciate hearing from all ECH with latest information on doings in your area. Traffic: VE2GJ 19, TE 36, BV 25, HR 28, JW 14, DS 9, FG 8, WH 8, VL 4, B2 2, DD 2, QL 2.

BRIEF

Following publication of the Sixteenth ARRL Field Day Results in December 1932 QST, it was brought to our attention that the seven-transmitter entry of the Associated Radio Amateurs of Long Beach, K5GGA/6, had not been listed. A check of FD files indicated that the K5GGA/6 log together with several mobile entries which were to have been credited to the Association's aggregate mobile score failed to reach ARRL HQ. Duplicate copies of logs have been submitted and we are pleased to credit A.R.A.L.B. officially with a score of 6840 points earned by 28 operators who made 760 QSOs. This score gives the Long Beach group second place in the seven-transmitter category. The additional points substantiated by duplicate mobile entries from W6ECH/6 (3564) and W6GGAU/6 (891) puts A.R.A.L.B. on top in the aggregate mobile listing with a grand total of 9492. W6ECH's mobile score topped by a wide margin those of all other Class C entrants. Congrats to the Long Beach gang on a fine FD performance!

STRAYS

Similarities are often confusing. Compare 15-year-old Lee Shoblon, KN6ADA, with another lad of the same age in the same area — Larry Sjoblon, KN6AEQ — whose last name is pronounced Shoblon, too. — W6EJF

G3GVF and G3ICU, located approximately 35 miles from London, offer to provide lodgings for W/VE amateurs attending the Coronation. First four come, first served.

When your only neon bulb succumbs in a fatal skirmish with gravity, W1UXS suggests a VR-tube as an emergency r.f. indicator. You may have to peer carefully to observe the glow.

High-power transmitting tubes with thoriated-tungsten filaments were thought quite impractical a few short years ago. While thoriated-tungsten filaments require 60 to 70 per cent less filament power than conventional types, have a 10-to-15-times greater electron-emission efficiency and operate at temperatures lower by 500 to 600 degrees Centigrade, engineers had long been baffled by the deactivation of such filaments at plate potentials in excess of 5000 volts. In recent years, however, design engineers have beaten this problem to such extent that a variety of these "impossible" tubes are now giving excellent performance. — RCA Victor News

VE3GG, advertising in the Toronto Daily Star to dispose of gear from the estates of hams deceased, was jolted when the printed word came out diseased. The ad drew many replies, all assuring VE3GG that the writers wouldn't touch the stuff with ten-foot poles.
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Modulator

(Continued from page 85)

cept keying, are performed by the switch on the modulator unit. The "Test-Operate" switch on the transmitter should be left permanently in the "Operate" position. Both power supplies run continuously, and the power switch controlling the 6X5GT heater transformer in each unit should be turned on sufficiently ahead of the power transformer to allow the 6X5GT heaters to attain temperature before the 5V4GT, for the reason mentioned in the November article.

The key may be left permanently in the jack on the transmitter, in contrast to the arrangement used in the original transmitter circuit.

For phone operation, the r.f. amplifier loading should be adjusted for a cathode current of 120 ma. with the grid current adjusted to 2 ma. This value of grid current gives the best linearity. Since the 6146 must be operated at reduced input for phone (plate input rating 67.5 watts) the carrier power output is somewhat less than is obtainable with c.w. operation where a higher input is permissible. Measured power output at 14 Mc, with the operating conditions above was 42 watts.

6146 Amplifier

(Continued from page 85)

All power wiring is done with shielded wire and the disk by-pass condensers are applied as recommended in the TVI chapter of the Handbook.

The two tuning controls should be centered 1 3/4 inches from the edge of the box. The photos show the box orientated so that the tubes are in a horizontal position, because in this position the controls fit more satisfactorily into a panel pattern including the VFO and multiplier units. However, the unit may be used with the tubes in a vertical position. In this case, it would be well to perforate the case with holes (not larger than 1/4 inch) in the area above the tubes. The assembly is fastened in the box with screws through the mounting feet of the tuning unit.

Operation

The circuit of Fig. 1 shows two methods of wiring up the power plug. P1 is wired up for c.w. operation only, while P2 is wired up to provide for either c.w. or plate-screen modulation. The audio choke, Lb, is used as described in the Handbook chapter on amplitude modulation. If desired, the meters shown may be replaced by the usual metering resistors and a single meter switched to read either grid current or plate current.

As operated here, the VFO, Bandbox multiplier and the 6146 screen, as well as all heaters, are operated from a single 120-ma. 375-volt supply (350-volt 120-ma. transformer with condenser input). A separate 600-volt plate supply is required for the 6146. The pin-jack input and out-
COLLINS 32V-3
TRANSMITTER
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Amateur Net
All band transmitter. 120 watts CW, 100 watts phone. Switches to all six bands. TVI suppression. Complete with 10 tubes, low power supply.

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Gosset 3-30 Converter ................................. $25.00
Gosset 2-Meter Converter ............................. $25.00
RME 70 with DB 20 Preselector .................. $125.00
RME VHF 152A ..................................... $50.00
Collins 32V-3 (Display Model) Never Used .................................................. $710.00
Meisner 150B Transmitter ......................... $250.00
National HRO-5 Complete ......................... $189.50
Hallicrafter Sky Challenger ....................... $35.00
National HRO-50 With Speaker and $269.50
A, B, C, D, E, (New Condition)
put terminals of the Bandbox were replaced by shielded 'phone jacks. All three units were mounted on a single large chassis. The VFO output and Bandbox input terminals were connected with a 12-inch piece of RG-59/U and the Bandbox output and amplifier input jacks with another piece 7 inches long. The cable to the amplifier should be limited to this length; otherwise, the added capacitance of the cable may not permit retuning of the Bandbox circuits to resonance.

The Bandbox gives more than adequate drive on all bands, with the VFO screen connected to the tap between VR tubes; i.e., 105 volts. The exciter unit should always be detuned to bring the grid current to the 6146 under load to 3 ma. The Bandbox circuits have sufficient cathode-resistor biasing to permit off-resonance operation without danger of excessive dissipation.

When the common low-voltage supply is turned on and the key closed, the 6146 screen, under excitation will draw more than normal current until plate voltage is applied and the plate circuit loaded to normal rating (115 to 150 ma 'phone and c.w., respectively). Although the screen dissipation does not run to dangerous proportions, the amplifier should not be operated without plate voltage and lead any longer than necessary to tune up the exciter.

When first tuning up the amplifier plate circuit, the tuning of the multiband tuner should be checked with an indicating wave-meter or a grid-dip oscillator to make sure that it is tuned to the desired band. The control should then be marked for the setting for each band, since otherwise it is not too difficult to get tuned up on the wrong band — the 6146 is a good frequency multiplier! The unit should be fed to the antenna through the usual link-coupled antenna tuner fitted, if necessary, with a low-pass filter in the link line, as described in the TVI chapter of the Handbook.

Silent Keys

It is with deep regret that we record the passing of these amateurs:

- ex-W1IFF, C. W. Klaft, Middletown, Conn.
- W10BY, Elmer M. Lants, South Lincoln, Mass.
- W2OEZ, Martin G. Jones, Rochester, N. Y.
- ex-SCP-3FJ, Edward P. Knowles, Trenton, N. J.
- W3RLW, Joseph J. Barr, Farrell, Pa.
- W4TE, Albin E. Burnett, Suffolk, Va.
- W4TNT, Charles E. Newton, Jr., Griffin, Ga.
- W4VXY, Robert H. Thompson, Orlando, Fla.
- W5MRR, Aubrey W. Williams, Bryan, Texas
- W6LS, Leo Shepard, La Canada, Calif.
- W7LYA, Elmer F. Walker, Newport, Wash.
- W8SFL, George J. Heintz, Flint, Mich.
- W9HSW, George E. McHarg, Brooklyn, Iowa
- W9LTY, Herbert L. Pendleton, Redland, Mo.
- W9SOO, Harry V. Eyring, Kansas City, Mo.
- OQRAS, Edmond De Mey, Stanleyville, Belgian Congo
- VP6ZI, Roderick D. Stewart, Bridgetown, Barbados
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- Hallicrafter S2L $119.95; S72 $109.95
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- Hallicrafter SX73 $975.00; SX62 $299.50
- Hallicrafter HT20 xmitter
- National SW54
- National NC125
- National NC183D
- National HRO 60x
- Harmanlund SP600UX $985.00; HQ129X $239.50
- Johnson VFO kit (wired $17.00)
- Johnson mobile xmitter $99.50
- Johnson Viking II (wired $57.00)
- Genset xmitter $124.50; Genset Super 6 $52.50
- Genset Communicator $199.50
- Morrow 388 $64.95; SBR $74.95
- Elmac A54H $149.00; Elmac A54 $139.00
- Elmac PMR6A mobile receiver $134.50
- Harvey-Well VFO $47.50
- Harvey-Well Deluxe $137.50; Senior $111.50
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justing for a circular pattern with the two r.f.
circuits connected to the 'scope deflection plates.
Although the article points out that this gives
only an approximate setting for the r.f. that
must be touched up after disconnecting the 'scope,
apparently a few fellows fail to touch up the r.f.
phasing later on. We take this opportunity to
remind them that the final r.f. phasing must be
done by observing the output of the exciter and
not with the 'scope connecting to the r.f. phasing
circuits.

75- and 40-Meter S.S.B. Operation

To simplify two-band operation with his 450-
kc. crystal-filter exciter, Ralph Porazzo uses the
double-conversion system shown in Fig. 2. A
block diagram is shown at A, illustrating the dual

![Block diagram of the exciter circuit.](image)

Fig. 2 — W6LLW simplified band-changing between
75 and 40 with his crystal-filter S.S.B. rig by using the
same VFO in two different parts of the circuit, as shown
at A. The high-level mixer circuit is shown at B. C1
is large and tunes to either 75 or 40 with the same L1
— L2 and L3 are 3- or 4-turn links.

injection of the VFO. The output of the high-
level mixer is tuned to the desired band.
The circuit of the high-level mixer is shown at
B, and is self-explanatory. It is essentially the
same as that described by W6EDD in this
column in the February issue of QST. With a
system like this, if the lower sideband is obtained
on 75 it will also be available on 40. — B. G.

News

(Continued from page 61)

visual aids and publications, as well as helpful
suggestions to hundreds of club and individual
groups seeking to publicize amateur radio by
this means. Here, effective planning is important,
the important factor being to avoid overcrowding
the display. You have all seen effective adver-
tising in large national magazines in which a pic-
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3016 "COMMANDER" TRANSMITTER
3.7 to 1.7 watts continuous. Power requirements: 9 to 12 volts DC at 20-25 ma (phone) and 6.3 volts AC or DC at 40-65 ma (phone). S/N and receiver provisions for all bands of the "COMMANDER" are generally the same as those for the "PIONEER". Tubes: 6AQ5 (2); 6X4 (2); 6PR7 (2). Final tank coils for 80 meters. Final tank for 40 meters. Weight: 8 lbs. Net... 124.50

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New! Fig. B, "Super Six" Converter. Covers 10, 15, 11, 12, and 11-10 meters. 75 meter band included. High stability and sensitivity. Great case, 5 1/2" x 5 1/4" x 1 1/2". Net... 52.50

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New! Model PMR-6-A Receiver, 10-tube dual-conversion unit. Covers 10, 15, 20, 40, 75, and 160 meter bands as well as the broadcast band. Requires 6 volts AC or DC at 4.5 volts AC or 6.3 volts DC at 20-25 ma (phone). Gray cabinet, 3 1/2" x 6 1/2" x 4 1/2". Weight: 6 1/2 lbs. Net... 134.50

Model A-54 Transmitter, 50 watt output for 80, 75, 60, and 11-10 meters. Temperature compensated VFO. Requires 6 volts AC or DC at 225 ma. Gray cabinet. Weight: 7 lbs. Net... 139.00

Model A54H, Similar to above, but for use with crystal or high impedance dynamic microphone. Net... 149.00

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5B 5-BAND CONVERTER

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MORROW
5B 5-BAND CONVERTER

Fig. A, All-band Antennas. Rugged and versatile antennas for operation on all Amateur bands from 10 through 80 meters. Heavily chrome-plated for beauty and durability. Center-loaded for maximum efficiency. Supplied complete with post for 20, 40 or 75 meter bands. Operates on 10 meters by shorting out coil. Easily installed — fits any mount with 3/8" S A E 1 e m a l e thread. Highest quality workmanship and materials. Coils are easily interchangeable. Overall length, 8'. Weight, 3 lbs. Net... 8.58

Fig. B. Whip Antennas. Finest stainless steel whips for maximum flexibility and strength. 3/8" threaded studs fit all mounts. Shipping weight, 3 lbs. Net... 5.10

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Fig. C. Model 132XG. Heavy duty body mount with coax fitting for whip antennas. Has adjustable split half swivel. Built-in coax connector. Net... 7.65

Fig. D. Model 140X. As above but with extra heavy duty spring. Net... 7.50

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Community” and then build your display around
that theme. In the latter instance, you might
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teur stations pinpointed to simulate a network of
emergency stations spread throughout the area to
serve the populace in time of disaster or civil need.

An amateur or club group undertaking an ex-
hibit project may obtain a quantity of the Novice
promotional booklet, “You Can Be There,” from
Hq. for distribution to the public.

The show exhibit or display can be accom-
plished by enlisting the aid of a local bank or mer-
cant and preparing an effective display for the
show window. Many stores and utilities often
make window space to civic and hobby groups
telling their story to the public.

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familiarization with the hobby, there are good
opportunities to address local civic clubs. Amat-
uer radio is a fascinating hobby to us — it can
be just as fascinating to the average citizen busi-
nessman. Working DX may be our primary in-
terest in amateur radio and as such a common-
place event, but some of our experiences in talking
with the world coupled with a general picture of
amateur radio makes engaging listening.

Hq. has more helps available, free on request.
One is a sample interview on amateur radio, a
compilation in question-and-answer form of usual
discussion with newspaper or radio men seeking
background information on amateur radio. If you
expect to be doing any contact work with the
radio or press, you should certainly have a copy
of the interview. You’ll find that it’s an excellent
source of statistical information on such subjects
as the number of licensed amateurs, the average
investment in a station and the average age of
amateurs in this country. Another mimeographed
pamphlet, available on request from Hq., is the
sample broadcast script. The text of this script
is applicable to a radio or television program, and
is so arranged as to utilize 30 minutes in its com-
plete form or 15 minutes when certain subpara-
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teur, your club will benefit as the local repre-
sentative group of amateurs and amateur radio will
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*The four books, available at your dealer, $1.25*

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West Hartford 7, Conn.
SSS Results
(Continued from page 67)

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W5TOH... 42.475... 1269-70-A-37
W5VFQ... 30.985... 307-61-A-40
W5QDA... 15.891... 279-63-A-15
W5KWP... 53.280... 245-67-A-25
K5WSP... 22.025... 216-53-B-12
WN1BD... 12.189... 130-51-B-16
WSUWA... 2205... 115-38-B-15

Canada

Maritime
VE1AR... 74.913... 539-60-A-37
VE1BB... 122.125... 488-59-A-40
YCHMC... 37.440... 295-52-A-30
VHBCU... 51.200... 225-55-A-27
VE1KD... 7215... 101-29-A-18
VO1N... 7228... 83-39-A-40
VE1BD... 3570... 61-30-B-7
YO3... 9055... 215-14-A-7
V27... 905... 21-14-A-13

Ontario
VESAWE... 95.288... 531-65-A-36
VE1BGX... 83.184... 505-67-A-40
VE1EAM... 85.080... 418-58-A-38
VE1GCH... 81.285... 310-67-A-33
VE1B... 85.000... 362-57-A-37
VE1B... 43.286... 295-33-A-33
VE1BX... 42.085... 265-57-A-37
VE1B... 32.604... 217-65-B-33
VESAAM... 32.231... 295-45-A-31
VESA3... 32.205... 217-39-A-17
VE1B... 19.655... 185-45-A-19
VE1B... 19.435... 171-40-A-12
VE1B... 15.620... 178-44-B-23
VE1D... 14.690... 205-29-A-36
VE1BB... 11.250... 110-45-A-17
VE1B... 9255... 110-34-A-21
VE1B... 7900... 98-34-A-22
VE1B... 7350... 110-25-A-24
VE1B... 7169... 98-37-A-21
VE1DD... 7035... 97-31-A-19
VE1B... 3124... 60-21-A-13
VE1B... 2518... 49-23-A-11
VE1BA... 2250... 50-19-A-9

VE1B... 17860... 46-16-A-14
VE1D... 16700... 40-17-A-59
VE1AS... 1554... 38-23-A-7
VE1B... 1485... 37-17-A-19
VE1B... 1445... 35-14-A-18
VE1B... 70... 7-4-A-4

Quebec

VE1OL... 14.315... 311-57-B-28
VE1SB... 12315... 311-45-A-18
VE1SD... 12235... 100-33-A-25
VE1DR... 11.985... 103-45-A-8
VE1X... 7520... 120-21-A-15
VE1AM... 3972... 43-64-B-23
VE1ADW... 985... 27-13-A-4
VE1AQW... 30... 4-4-A-2

Alberta

VE1MA... 47.015... 307-42-A-38
VE1GU... 10.195... 145-52-A-29
VE1QQZ... 15.85... 175-48-B-34
VE1Z... 3858... 82-30-A-10
VE1C... 1220... 28-24-A-4

British Columbia

VE1JO... 61150... 310-64-A-21
VE1JR... 40125... 285-60-A-3
VE1AT... 21802... 204-57-B-29
VE1ABD... 225... 19-10-A-15
Manitoba

VE1ER... 10.965... 110-45-B-19
VE1HR... 6815... 105-58-B-21
VE1PK... 5325... 50-20-A-11

SASKATCHEWAN

VE1B... 98450... 547-72-A-38
VE1BB... 3170... 237-57-A-17
VE1BV... 2920... 189-57-A-10
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W7S... 1W8WX, oor.
W7BSO,... 1W8SUN, oor.
W7ZKJ... 1W7LOO, oor.
W7KXX... 1W7SSZ, oor.
W7ENW, oor.
W7G... 1W7G, staff, not eligible for award.
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W3AYS... 25.575... 151-50-A-18
W3MAX... 20.79... 151-40-A-30
W3VVF... 105... 106-20-A-12
W3QFQ... 331... 7-A-2
W3OXY... 125... 5-A-3
W3CHF... 35-3-A
W3QKO... 1W8WDB, W2BNZ
W3QO... 4220... 295-30-65-B-12

Southern New Jersey

W2AER... 1129... 64-26-A-19
Western New York
W2CE... 23.236... 206-54-B-19
W2GI... 24.435... 185-45-A-21
W2ION... 19.816... 163-61-B-27
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(Continued on page 134)
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COAXIAL SELECTOR SWITCH
50 Ohms — Type N Connectors—Manually Controlled
Low VSWR — 4 Models

The COAXSWITCH is an RF switch for use in coaxial circuits where it is important that the 50 OHM impedance of the cables be maintained. In a circuit sense, this switch consists of two pairs of "N" connectors spaced 4 1/2" apart using RG-8/U at the connecting link. The COAXSWITCH itself introduces no VSWR other than that of connectors. Characteristic impedance is maintained thru all switch details. Cut-a-way view shows that shield as well as center conductor is switched. Beryllium copper contacts, on the gusset neck, mate directly with male "N" (Type UG-21B/U) connectors, which connect directly to back plate of switch. Since all connectors come out in line with axis of switch, right angle connectors are usually unnecessary.

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W4YEA.......... 10.286-193-47-7-B-22
W4KVM........ 934-92-63-A-6
W4KF0........ 2270-30-29-A-6-1
W4WEO........ 216-12-6-A-1
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W4FQK........ 13,312-133-88-B-15
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W6ORD ....... 15,509-108-49-A-49
W6NWS........ 3458-76-18-A-70
W6RJ*....... 1120-29-29-B-2
W6BJV........ 1320-29-29-B-2
W6JHJ........ 329-31-9-A-7
W6MYG........ 29-10-1-A-2
W6GAH........ 2-1-1-B-1
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W9BN ........ 2,168-170-41-A-51
W98D ........ 3300-11-25-A-11
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W9MYT ....... 51,188-266-65-A-37
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VE6DU ........ 3-1-1-A-1
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Manitoba
VE4K .......... 9008-91-44-B-20
1 W2GVR, o.p.
2 Ha, staff, not eligible for award.
3 W1WPR, o.p.
4 W4ONL/4, o.r.
5 W4FFW, o.p.
6 W4GUP, o.p.

RACES.
(Continued from page 68)

The FCDA plan, on the other hand, while also concerned with avoidance of interference, puts more emphasis on national aspects of RACES by assigning nationwide liaison frequencies for specific C.D. services, so that all units of such services will have a common meeting frequency, regardless of their home territory. (RACES points out the possibility of mutual aid and mobile support units coming by flat car from points hundreds, even thousands of miles away.) It designates certain blocks of channels of the RACES segments to certain purposes; and it bases most allocations on f.m. in view of its advantage in mobile work. This latter in particular is considered by opposing amateurs to be unrealistic of the present capabilities of the amateur service in implementing RACES.

Collaboration

Ever since the advent of RACES, and before, ARRL has maintained close contact with officials of FCDA and FCC. Relations have been cordial and cooperative. We have listened, on the one hand, to amateurs insinuating vile government plots to deprive us of our frequencies; and on the other hand, to government expressions of dis-
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MULTIPHASE EXCITER MODEL 10A (upper left). Appen-
dons, 10 watts peak output 160 to 20 meters, somewhat less on 10-15 meters. Will drive beam power transmitters more than 1

KWC input from 20 to 160 meters. SWITCHABLE SSB, with

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RACES is hardly enough. We aren't through yet.

There is much to be done, for the task of prepara-

tion for civil defense communications is an

arduous and complicated one. There are many

factors involved that are foreign to most of us.

We suggest you "keep tuned" to the "Operating

News" department of QST for further infor-

mation, and to WIAW bulletins for any important

developments. Meanwhile you can help, if you

will, by investigating the civil defense situation in

your own home town and, if nothing has been done

toward integrating the amateur into the com-

munications program, by interesting yourself

actively in this present-day operating phase of our

amateur service.

Y€ News & Views

(Continued from page 65)

W2NY. .......................... 3,300      --      --
W4RL. .......................... 2,800      --      --
W1AW. .......................... 3,060      --      --
W6CMG. .......................... 2,000      --      --
W6AQ. .......................... 2,520  ...........      --
W3FSP. .......................... 2,380  ...........      --
W1FBI. .......................... 2,160  ...........  2,100
W4EX. .......................... 1,920  ...........  1,920
W8PFD. .......................... 1,920  ...........  1,920
W3BET. .......................... 1,870  ...........  1,870
W3QLW. .......................... 1,800  ...........  1,800
W3LBT. .......................... 1,800  ...........  1,800
W3FVS. .......................... 1,500  ...........  1,500
W4HIUW. .......................... 1,500  ...........  1,500
VE3ATR. .......................... 1,320  ...........  1,320
W1JFB. .......................... 1,200  ...........  1,200
W5CDG. .......................... 1,100  ...........  1,100

These are the official results received from

YLRL Vice-President W3JSH. W3QPJ, Kay,

helped Dottie in the task of log-checking.

(Continued on page 138)
# FREED TRANSFORMERS

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|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
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| Saturable Reactors | High Pass Filters | Modulation Transformers |
| Toroid Inductors | Band Pass Filters | Blocking Oscillator |
| Low Pass Filters | Discriminators | Transformers |
| High Pass Filters | Plate Transformers | Band Elimination Filters |
| Power Transformers | |

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<th>NO. 1020 B MEGOHMETER DIRECT READING</th>
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<tbody>
<tr>
<td>Self-contained and A.C. operated with electronically regulated supply, 1 megohm to 2 million megohms.</td>
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<tr>
<th>NO. 1010 COMPARISON BRIDGE</th>
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<td>Self-contained and A.C. operated. For rapid and accurate test of Resistors, Condensers and Inductors.</td>
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<tr>
<th>OTHER FREED</th>
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<tbody>
<tr>
<td>NO. 1030 Low Frequency Q. Indicator</td>
</tr>
<tr>
<td>NO. 1110A Incremental Inductance Bridge</td>
</tr>
<tr>
<td>NO. 1150 Universal Bridge</td>
</tr>
<tr>
<td>NO. 1170 D.C. Supply</td>
</tr>
<tr>
<td>NO. 1210 Null Detector and Vacuum Tube Voltmeter</td>
</tr>
</tbody>
</table>

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<tr>
<th>FREED TRANSFORMER CO., INC.</th>
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When the Hamilton Amateur Radio Club (Ontario, Canada) was awarded a trophy by the Marconi Company for having the highest Canadian Field Day score, VE3BT, Rose, Halifax, was unable to attend the presentation ceremony. However, in recognition of Rose’s fine amateur record and courage, company officials later brought the trophy to her home where it will remain at her bedside. An active amateur until she became seriously ill a year ago, she was especially fond of contests and Field Day operation and has several certificates and awards to testify to her efficiency. Rose is very proud of the honor she has received—amateurs and all those who know her are very proud of her.

Keeping Up With the Girls

Some kind of record was made when W7TDU, Alice, and W4WYF, Myrtle, checked into the N.E. YLRL Net at seven in the morning recently — both girls have seven young junior ops! "Ham in Pigtails" is how ten-year-old W8NBNC, Jean, of Pueblo, Colorado, depicts herself on her QSL. . . . VE6MNP has been experimenting with antennas on Forty, but Madeira predicts cautiously because transmitting tubes are dear in her small town (Chancellor, Alberta — pop. 35). . . . K7LAU, Carmelita, is on single sidetone on 75 and 20. . . . W2PBI of N. Y. O. made DXCC, WAC, WAS, BERTA and WBE, all on ten; phone was "hot," the operator says. The same distinction can be applied to Jerry’s OM (W2YTL), too. . . . W9DXX, Alice, and W9MYC, Gladys, are the only two YEs amid some 100 stations in the Chicago area in the Fixed-Frequency 147.5 Me. Net. . . . Historian for the Knights of the Killogyles, OM W4HGO, reveals that his organisation boasts four “Lady Knights” — W4AGB, Ellery; W4HWR, Bilda; W4MXP, Jane; and W5LGO, Helen.

YL Convention

The Third Annual W9 YL Convention will be held May 22nd and 23rd in Mishawaka, Indiana. Meetings, lectures, luncheons, tours, a banquet and dancing are on the program. YLs from all call areas are invited. For further information, please contact Convention Chairman Julls Morgan, W0LKT, 135 Montana Ave., Mishawaka, Ind.

The W9 YLRL District Chairman, Grace Ryden, W9GME, is an organizer and some 85 YLs in the Chicago area can prove it. Grace has brought them all closer together by organizing the first YL club in Chicago (Ladies Amateur Radio Klub) and initiating the first W9 YL net on ten meters. Now she’s making plans for a Chicago YLRL unit. When not busy with club work or on the air, Grace enjoys experimenting with antennas and keeping her station in good repair. Her OM, Jim, is not a ham, but Grace claims he’s adept at holding up antennas.
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(Continued from page 73)

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KN2BBA.... 175- 11- 8-9
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KN2BON.... 1900- 61-21-34
KN2BBY.... 225- 57-12-6
KN2BMET.... 1972- 39-13-31
WN2BBL.... 809- 28-14-16
KN2AFFY.... 809- 28- 8-9
KN2NNC.... 809- 28- 6-3
KN2AOG.... 809- 28- 7-6
KN2AXF.... 809- 28- 8-9
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WN2BNK.... 1592- 60-19-16
KN2AJP.... 720- 46-12-8
KN2BOF.... 324- 58- 9-8
KN2BBF.... 324- 58- 9-8
Kensington

MIDWEST DIVISION
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WN2GMN.... 302- 23- 8-10
WN2EBC.... 12- 2- 1-2
Missouri
WN2ORL.... 210- 24- 9-10

NEW ENGLAND DIVISION
Connecticut
WN2VWX.... 1953- 75-21-37
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WN2MDW.... 1306- 55-19-19
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WN2WK.... 84- 11- 4-10

NORTHERN DIVISION
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PACIFIC DIVISION
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WN8CIV.... 1720- 80-13-22
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WN8QAC.... 364- 21-11-8
WN8EOJ.... 692- 55-12-30
WN8BCU.... 54- 27-3-3

ROANOKE DIVISION
North Carolina
WN4WXX.... 2075- 25-24-12
WN4WEL.... 1144- 42-22-32
WN4RBB.... 1100- 45-20-6
WN4RNB.... 1200- 50-21-35
WN4WFO.... 1232- 17-11-18
Virginia
WN4YQY.... 2118- 26-28-30

SOUTHEASTERN DIVISION
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SOUTHWESTERN DIVISION
Los Angeles
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WN2RUX.... 3572- 121-32-23
WN2SUI.... 90- 18- 5-8
San Diego
WN6EJ.... 1292- 59-30-23

WEST GULF DIVISION
Northern Texas
WN5NYW.... 1150- 50-23-37
OWK25DE.... 30- 6-3-2
New Mexico
WN5YBJ.... 972- 14-18-19
WN5WYF.... 132- 6-3-3

Answer to QUIZ QUIZ on page 72

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You can enter this crowded, interesting field. Defense expansion, new developments demand trained specialists. Study all phases radio & electronics theory and practice; TV; FM; broadcasting, receiving, aviation, marine, police radio. 14-month course. Graduates in demand by major companies. H.S. or equivalent required. Begin Jun, Aug, Dec. Write for Catalog.

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MODEL 600-S
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PHONE/CW TRANSMITTER
LARGE VFO DIAL
FULLY CALIBRATED

The LYSCO Model 600-S, designed for 160, 80, 40, 20, 15, 10 meter operation, is a 35 watt, TVI Suppressed, clamp tube modulated, VFO/crystal, phone and CW transmitter, with the final working straight throw all bands. The oscillator is a series tuned "Colpitts" circuit. The clamp tube modulator used in the 401 Clampmeter is built in. The large dial gives ample spread on all bands and is illuminated for ease readability. This is the Novice's dream — good contacts and later for driving any powered final.

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Correct matching will put that lost power into the antenna. The EaZon type JWA is designed for this purpose. Strong, easy to install and foolproof. Fits RG-8/U or any coax of similar dimensions. Weight 4 ozs. Satisfied users throughout the U.S. Types 3W and 4W are ideal junctions for stub or harmonic traps.

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ATTENTION

Junction, completely out of the disaster area, is now back in operation. To be deployed for two reasons: first, it has interrupted the flow of vital intelligence and disturbed the sequence in which other stations have been asked to stand by with their traffic; and second, he is likely not ever to be called on to expedite traffic because his methods fail to elicit confidence and his operating procedure has not been advantageous to us.

Constructively, what must we do? (1) Invest absolute authority in the NCS. (2) Listen before transmitting. (3) Zealously maintain the Golden Rule with others who seek to use the frequencies. (4) Concede our mistakes and try to do better the next time.

Arthur W. Woods, M.D., W4GWS

411 Lee Street

Bristol, Va.

SLOSHI

Navy No. 138

315A North 48th St.

Milwaukee 16, Wisconsin

Editor, QST:

Your article on Lunar DX in the March QST was about as interesting as a wet mop. Why not have more articles on technical subjects such as s.s.b. and TVI instead of such junk?

Don McEwan, W3RSF

Editor, QST:

Your editorial in the March, 1953, issue sounds good until I listen in the 80- and 40-meter 'phone bands. It sounds to me as if the FCC has been too busy to count all of the amateurs licenses they have been issuing. Out here in Wisconsin I could swear that I can hear at least 110,000 on 3000 kc. alone!

Charles Kastel, W8SNK

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A Service of Radio Corporation of America

350 West 4th St., New York 14, N. Y.

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Openings require previous training at high school, armed service school, or technical institute level and in general 2 or more years of applicable industrial or military experience.

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<table>
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<tr>
<th>10 METER DIPOLE</th>
<th>6 METER 2 EL-BEAM</th>
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WESTON LABORATORIES, Inc.
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Furnished complete, easy and quick to assemble. Instructions and all data included. Strong aluminum casings and tubing, less mast and wire. Made by hams and sold to hams, no dealers. Literature on request. All antennas adjustable over entire band. ORDER NOW—IMMEDIATE SHIPMENT.

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Tulsa 8, Okla.
W6. K6 — Horace R. Greer, W6TI, 414 Fairmount St.,
Oakland, Calif.
W7. K7 — Mary Ann Tatro, W7FWR, 513 N. Central
Olympia, Wash.
W8. K8 — Norman W. Aiken, W8LJS, 701 East 24th St.,
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A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system 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 4½ by 9½ 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. 62, Dec., 1952, QST.

W1. K1 — J. R. Baker, Jr., W1JOJ, Box 232, Ipswich, Mass.
W3. K3 — Jesse Biebian, W3KT, Box 34, Philadelphia
4, Penna.
W4. K4 — Thomas M. Moss, W4HYW, Box 644, Municipal
Airport Branch, Atlanta, Ga.
W5. K5 — Oren B. Gambill, W5WI, 2514 N. Garrison,
Tulsa 8, Okla.
W6. K6 — Horace R. Greer, W6TI, 414 Fairmount St.,
Oakland, Calif.
W7. K7 — Mary Ann Tatro, W7FWR, 513 N. Central
Olympia, Wash.
W8. K8 — Norman W. Aiken, W8LJS, 701 East 24th St.,
Euclid 23, Ohio.
Wauwatosa, Wis.
W10. K10 — Alva A. Smith, W9DMA, 238 East Main St.,
Caledonia, Minn.

FEED-BACK

The "All-Purpose Super-Selective I.F. Amplifier" (March, 1953, page 23) carried a wiring-diagram error that could confuse anyone who was following the text closely. In Fig. 3, the leads to the No. 7 pins of the two 12AU7 detector tubes were inadvertently reversed. C54 and R59 should connect to Pin 7 of the lower 12AU7 detector tube, and the lead from the arm of R36 should run to Pin 7 of the upper 12AU7 detector tube. The unmarked resistor running to C6 is R7.

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Ham wanted by large Northern New Jersey electronic distributor to work as radio parts counterman. Large ham business. Excellent opportunity for right man. Inquiries held in strictest confidence.

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XTALS FOR ALL PURPOSES!

LOW FREQUENCY SAWA for 651 kHz-5 MHz, 5/8" or 4/5" resonator, all bands listed by fund. Fractions omitted.

<table>
<thead>
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SPECIAL—200KC in Holder—1/2" SPC $1.95
35MMFD Double Spaced Var. Cond.—3 for 1.00
Telegraph Key—knee mount .75
Elevator Servo Amp. with tubes .39
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Ant. Relay Unit—BC442A .39

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GARDINER & COMPANY

NEW JERSEY
Armed Forces Day
(Continued from page 64)
The Pentagon, Washington 25, D. C. Time and call sign of the station copied should be indicated as well as the name and call sign of the amateur concerned.

Military-to-Amateur Test
Military stations AIR, NSS and WAR will be on the air between 1800 and 2100 (EST) on May 16, 1953, to contact and test with amateur radio stations. The military stations will operate on spot frequencies outside the amateur bands as follows:

<table>
<thead>
<tr>
<th>Station</th>
<th>Frequencies (kc)</th>
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<tbody>
<tr>
<td>AIR (Air Force Radio Washington)</td>
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<td>14,405 (A3)</td>
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<tr>
<td>NSS (Navy Radio Washington)</td>
<td>4015 (A1), 7375 (A1),</td>
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<td></td>
<td>14,385 (A1)</td>
</tr>
<tr>
<td>WAR (Army Radio Washington)</td>
<td>2220 (A3), 4085 (A3),</td>
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<tr>
<td></td>
<td>6697.5 (A1)</td>
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</table>

Contacts will consist of brief exchanges of locations and signal reports. The military stations are not permitted to handle traffic nor exchange messages. Amateurs are requested to refrain from asking for this service. Prompt and courteous operating practices will make it possible for the military stations to contact the largest number of amateur stations. Each military station will send a QSL card to each amateur station worked.

Warning! In both the 1951 and 1952 exercises, a few amateurs operated on the military frequencies rather than in the amateur bands. No authority exists for amateur operation outside the amateur bands during this test. Similarly, amateurs affiliated with MARS or USNR networks which drill on military frequencies are not authorized to use the military frequencies for purposes of these Armed Forces Day exercises. AIR, NSS and WAR will limit contacts to amateur stations in the amateur frequency bands.

Each CQ by AIR, NSS or WAR will indicate the frequencies on which each will listen for replies. These frequencies normally will be in blocks of 50 kc. For example: "CQ CQ CQ DE NSS NSS NSS ANS 3550 to 3600 KCS." Novice frequencies will be accorded the same attention as is given the remainder of the amateur bands. It is hoped that more Novices will participate this year than did in 1952.

M.A.R.S. Bulletin Schedule
The MARS Headquarters Station WAR/AIR, located in the Pentagon, Washington 25, D. C., sends a weekly transmission of general interest to all MARS members every Monday at 2000 and 2300 EST on 3497.5, 6097.5, 14,405.0, 20,994.0 and 27,994.0 kc. These transmissions, which generally consist of about 60 to 100 groups, are transmitted at 25, 20 and 15 w.p.m. Beginning the first Monday in April and the first Monday each month thereafter a broadcast at 55 w.p.m. will precede the regular transmission speeds.
THE No. 39024 LOCK TYPE HIGH VOLTAGE INSULATED SHAFT EXTENSION

Now the Milten DESIGNED FOR APPLICATION No. 10061 shaft locks and the No. 39024 insulated high voltage potentiometer extension mountings are available as a single integrated unit—the No. 39024. The proper shaft length is independent of the panel thickness. The standard shaft has provision for screwdriver adjustment. Special shaft arrangements are available for industrial applications. Extension shaft and insulated coupling are molded as a single unit to provide accuracy of alignment and ease of installation.

JAMES MILLEN MFG. CO., INC.
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Monitors any low frequencies anywhere between 15 mc and 175 mc, checking both frequency deviation and amount of modulation. Keeps the Beam™ on allocation guarantee on solid coverage, too!

JK STABILIZED H-17 CRYSTAL

CRYSTALS FOR THE CRITICAL

The JK H-17 Crystal meets rigid airline requirements for compactness, light weight, rugged dependability. A Military type, it is hermetically sealed—dust and moisture proof—plated, quartz plate is shock mounted. One of many JK Crystals made to serve every need.

Ceiling Zero...Communications 100% "Pea soup" over the field...and still the giants of air travel come in "on the beam". When visibility is poor, commercial pilots must rely on radio-radar equipment to bring their ship in safely. JK Crystals play an important role in this every day drama of keeping airlines communications "on the beam" in the air and on the ground.

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Right for the Job!

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(Medium Duty—40 and 50 Amperes)

Delco-Remy extra-output generators are an economical answer to the electrical needs of cruising taxicabs, suburban police cars, rural mail cars... other vehicles with additional lights, two-way radios, special electrical equipment in moderate to heavy-duty service. For this type of operation, these Delco-Remy extra-output generators offer the triple advantages of low initial cost, simple installation and economical maintenance.

DELCO-REMY 40-AMP. GENERATOR has low cut-in... charges at curb idle from 11 to 17 amperes... attains full output at 18 mph when using a three-inch pulley.

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See your nearest United Motors distributor for further information and application data.

WHEREVER WHEELS TURN OR PROPELLERS SPIN

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Division, General Motors Corporation
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IN THE ROYALTY OF RADIO The HRO Sixty IS THE KING OF RECEIVERS

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$483.50* (less speaker) SLIGHTLY LESS THAN THE CROWN JEWELS!

National Company, Inc., Malden, Massachusetts

"KEEP YOUR GUARD UP — JOIN THE NATIONAL GUARD"
"Field Day" or Any Day

... it's RCA Beam Power Tubes

At every "Field Day" installation there's an air of feverish excitement and enthusiastic activity. It's the pay-off time — when skill and ingenuity are put to stiff competitive test.

Under these conditions, the experienced amateur demands the best possible performance from his transmitter. For that reason, most rigs will be equipped with beam power tubes, which, even when operating from low-voltage portable power supplies, provide top efficiency and high power. These two features alone have established RCA-developed beam power tubes as a leading class in the amateur radio field.

Take advantage of the extras that RCA beam power tubes offer. Design your next "Field Day," mobile, or fixed-station rig around RCA beam power tubes. Your RCA Tube Distributor will give you prompt service on the complete line.

Check List of "Field Day" Finals

<table>
<thead>
<tr>
<th>Tube Type</th>
<th>Plate Volts</th>
<th>Plate Input (w)*</th>
<th>Freq. (Mc)</th>
<th>Field Day Score Multipliers</th>
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<td>RCA-2E26</td>
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<td>RCA-807</td>
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*Max. C.W. Rolings ICAS