The engineering team that developed the incomparable SX-101 and HT-32 now offers a precision rig that puts single sideband within reach of all

HT-37 Transmitter

The heart of the now-famous HT-32—the needed, basic performance characteristics—is yours in this precision-engineered new AM/CW/SSB transmitter—and at a price we did not believe possible when we began designing it! Same power. Same rugged VFO construction, and identical VOX. You'll be amazed at the smooth, distinctive speech quality that's yours for the first time at moderate cost.

FEATURES: 144 watts plate input (P.E.P. twotone); five band output (80, 40, 20, 15, 10 meters); all modes of transmission—CW, AM, S.S.B.; unwanted sideband down 40 db at 1KC; distortion products down 30 db, or more; carrier suppression down 50 db; modern styling; instant CW Cal. from any mode; both sidebands transmitted on AM; precision V.F.O.; rugged heavy duty deluxe chassis; 52 ohm pi network output for harmonic suppression; dual range meter for accurate tuning and carrier level adjustment; ideal CW keying; full voice control system built in.

FRONT PANEL CONTROLS, FUNCTIONS, CON-

NECTIONS: Operation—(power off, standby, mox, cal, vox); Audio gain; R.F. level; Final tuning; Function—(upper sideband, lower sideband, DSB, CW); carrier balance; Calibration level; Driver tuning; Band selector V.F.O.; Microphone connector; Key jack.

TUBES AND FUNCTIONS: (2)-6146 Power output amplifiers; 6C6B Variable frequency oscillator; 12BY7 R.F. driver; 6AH6 1st Mixer; 6AH6 2nd Mixer; 6AB4 Crystal oscillator; 12AX7 Voice control; 12AT7 Voice control; 6AL5 Voice control; 12AX7 Audio Amplifier; 12AT7 Audio amp and carrier Oscillator; 12AT7 Audio Modulator; (2)-12AT7 Balanced Modulators; 5R4GY HV Rectifier; 5V4G LV Rectifier; OA2 Voltage Regulator.

REAR CHASSIS: Co-ax antenna connector; Line fuse; Control connector; AC power line cord.

PHYSICAL DATA: Matching unit for SX-111; cabinet is gray steel with brushed chrome trim and knobs. Size: 9" high x 19½" wide x 13½" deep. Shipping weight: approximately 80 lbs.

The new ideas in communications are born at...

Export Sales: International Division,
Canada: Gould Sales Co., Montreal, P.Q.

hallicrafters
Chicago 21, Ill.
SX-111 Receiver

Here's the receiver you've been waiting for—a real thoroughbred that retains the essential performance characteristics of the renowned SX-101, but at a price that can put it in your shack tomorrow! Rugged... dependebale... beautifully styled, the new SX-111 is outstanding evidence that Hallicrafters aim is always to bring you the finest equipment at the lowest possible price.

**FREQUENCY COVERAGE:** Complete coverage of 80, 40, 20, 15 and 10 meters in five separate bands. Sixth band is tunable to 10 Mc. for crystal calibrator calibration with WWV.


**SENSITIVITY:** One microvolt on all bands, with 5 steps of selectivity from 500 to 5,000 c.p.s.

**TUNING MECHANISM:** New friction-and-gear type with 48:1 tuning ratio. Virtually eliminates backlash.

**CONTROLS:** Tuning; Pointer Reset; Antenna Trimmer; T-notch Frequency; RF Gain; Audio Gain; Band Selector; Function (off/on, standby, upper or lower sideband, calibrate); AVC off/on; BFO off/on; ANL off/on; Selectivity.

**TUBES:** 10 tubes plus voltage regulator and rectifier. 6DC6 RF Amplifier; 6BY6 1st converter; 6C4 Oscillator; 6BA6 2nd converter; 12AT7 Dual crystal second converters; 6CB6 1650 kc. i.f. amplifier; 6DC6 i.f. amplifier (50 kc.); 6BQ7 AVC-noise limiter-detector; 12AX7 1st audio and BFO; 6AQ5 Power output; 5Y3 rectifier; AO2 Voltage regulator.

**POWER SUPPLY:** 105-125 volts, 50-60 cycle AC.

**PHYSICAL DATA:** Size: 18 3/4" wide x 10 1/4" deep x 8 3/4" high. Attractive gray steel cabinet with brushed chrome trim. Shipping wt. approximately 40 lbs.

Two outstanding speaker values

R-47 SPEAKER

Specially designed for voice and SSB. Flat response from 300 to 2850 c.p.s. Input impedance: 3.2 ohms. Size: 5 1/2" x 5 1/4" x 3 1/2". Wt. 2 1/2 lb.

R-48 SPEAKER (See photo with HT-37 and SX-111). Latest design. elliptical assembly. 3.16 oz. Alnico V magnet. Fidelity switch for music or voice. 3.2 ohm input impedance. 6 1/2" x 13 1/4" x 8 1/4".

SX-110 Receiver

The last word in features and design!

SX-110 Receiver

Never before have so many outstanding, wanted features been incorporated in an all-purpose receiver—features developed originally for the highest-priced sets.

**FREQUENCY COVERAGE:** Broadcast Band 540-1680 kc plus three short wave bands covers 1680 kc—34 mc.

**FEATURES:** Slide rule bandspread dial calibrated for 80, 40, 20, 15 and 10 meter amateur bands and 11 meter citizens' band. Separate bandspeed tuning condenser, crystal filter, antenna trimmer, "S" Meter, one r-f. two i-f stages.

**INTERMEDIATE FREQUENCY:** 455 kc.

**TUNING ASSEMBLY AND DIAL DRIVE MECHANISM:** Ganged, 3 section tuning capacitor assembly with electrical bandspread. Circular main tuning dial is calibrated in megacycles and has 0-100 logging scale.

**AUDIO OUTPUT IMPEDANCE:** 3.2 and 500 ohms.

**TUBE COMPLEMENT:** Seven tubes plus one rectifier: 6SG7, r-f amplifier—6SA7, converter—6SG7, 1st i-f amplifier—6SK7, 2nd i-f amplifier—6SC7, BFO and audio amplifier—6K6GT, Audio output—6H6, ANL-ADC-detector—6Y3GT, rectifier.

**AUDIO POWER OUTPUT:** 2 watts.

**POWER SUPPLY:** 105/125 V., 50/60 cycle AC.

**PHYSICAL DATA:** Gray steel cabinet with brushed chrome trim. Size 18 3/4" wide x 8" high x 10 3/4" deep. Shipping weight approximately 52 lbs.

S-108 Receiver

Same basic performance as SX-110 (above) less S-Meter, antenna trimmer and crystal filter, but includes a built-in speaker.
POINT-PACKED
FIELD DAY PERFORMANCE

with Collins KWM-2 Mobile SSB Transceiver

Here's the teammate that can put you among the high scorers in Field Day competition . . . Collins KWM-2 SSB Transceiver. It sets up in minutes and delivers top fixed station performance under the most severe Field Day emergency conditions.

The KWM-2, the only SSB mobile transceiver on the market, quickly slips from its mobile mount to a fixed station installation. It instantly connects to a power supply, antenna and antenna selector. One compact unit transmits and receives, yet weighs only 18 lbs.

The 100 watts P.E.P. SSB output gives you a strong, clean signal from 3.4 to 30.0 mc. Mechanical Filter Sideband generation, Automatic Load Control, RF inverse feedback and exceptional frequency stability assure extra fast contacts, even on crowded bands. That means you get more QSO's in less time for more total points.

Get a first hand demonstration at your nearby Collins Distributor. He'll show you how easy it is to be a top Field Day scorer with the Collins KWM-2.
HEATH Chooses EIMAC Tetrodes For First Build-It-Yourself High Power Linear Amplifier

When pioneering manufacturers get together, exciting new progress is bound to result. For example, take this new high power "Chippewa" linear amplifier designed by Heath — leader in build-it-yourself electronics — with two 4-400A power tetrodes produced by Eimac — pioneering electron tube specialists.

This new amplifier makes possible operation at maximum legal amateur power inputs in SSB, CW or AM service. It adds to the group of Heath ham equipment full power capability along with complete versatility in the present day modern amateur station.

Heath's choice of Eimac 4-400A radial-beam tetrodes was a natural one. These time-proved tubes complement the amplifier’s simple, clean, straightforward design. And their low grid-plate capacitance and low driving-power requirement aid in considerable simplification of the associated circuit and driver stage — to make do-it-yourself construction even easier.

You can always depend on Eimac tubes to meet standards of high performance and reliability demanded in exacting amateur and commercial applications such as this. For complete information on Eimac tubes write our Amateur Service Department.

EITEL-McCULLOUGH, INC.
San Carlos, California
It pays to insist on

PR crystals

STANDARD OF EXCELLENCE SINCE 1934

AMATEUR TYPES

40 and 80 Meters, PR Type Z-2
Rugged. Low drift, fundamental oscillators. High activity and power output. Stands up under maximum crystal currents. Stable, long-lasting; ±500 cycles.............................................$2.95 Net

2 and 6 Meters, PR Type Z-9A
Third overtone: multiplies into either 2-meter or 6-meter band; hermetically sealed: calibrated 24000 to 24666, and 25000 to 27000 Kc., ±3 Kc.; .050" pins.........................................................$4.95 Net

6 Meters, PR Type Z-9A
Fifth overtone: for operating directly in 6-meter band; hermetically sealed: calibrated 50 to 54 Mc., ±15 Kc.; .050" pins.$6.95 Net

CITIZENS BAND CLASS “D”

Type Z-9R, Transmitter
FCC assigned frequencies in megacycles: 26.965, 26.975, 26.985, 27.005, 27.015, 27.025, 27.035, 27.055, 27.065, 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175, 27.185, 27.205, 27.215, 27.225; calibrated to .005%, (be sure to specify manufacturer of equipment)..........................$2.95 Net

CITIZENS BAND CLASS “D”

Type Z-9R, Receiver
Specify I.F. frequency, also whether or whether I.F. is above or below transmitter frequency. Calibrated to .005%. (Be sure to specify manufacturer of equipment).............................................$2.95 Net

Type Z-9R, Radio Control
FCC assigned frequencies in megacycles: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255; calibrated to .005%. (Be sure to specify manufacturer of equipment)..........................$2.95 Net

Type 2XP
Suitable for converters, experimental, etc. Same holder dimensions as Type Z-2.
1600 to 12000 Kc., (Fund.) ±5 Kc.............................................$3.45 Net
12001 to 25000 Kc. (3rd Overtone) ±10 Kc......................................$4.45 Net

ALL PR CRYSTALS ARE UNCONDITIONALLY GUARANTEED. ORDER FROM YOUR JOBBER.

COMMERCIAL TYPES

Commercial Crystals available from 100 Kc. to 70 Mc. Prices on request.

Type Z-1, MARS and CAP
Official assigned frequencies in the range. Calibrated to .005%, 1600 to 10000 Kc...............................$3.45 Net

Type Z-1, TV Marker
Channels 2 thru 13.............................................$6.45 Net
4.5 Mc. Intercarrier, .01%.............................................$2.95 Net
5.0 Mc. Signal Generator, .01%.................................$2.95 Net
10.7 Mc. FM, IP, .01%.............................................$2.95 Net

Type Z-6A,
Frequency Standard
To determine band edge. To keep the VFO and receiver properly calibrated. 108 Kc...............................$6.95 Net

PETERSEN RADIO CO., Inc. 2800 W. Broadway
COUNCIL BLUFFS, IOWA

EXPORT SALES: Royal National Corporation, 250 W. 57th Street, New York 19, N.Y., U.S.A.
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An invaluable reference work and text for everyone—radio amateurs, engineers, lab men, technicians, experimenters, students, purchasing agents.

Keeping pace with progress, this big, new edition of the ever useful Handbook contains many descriptions of new equipment. Semiconductor and vacuum tube listings and tables are brought up to date. Every important aspect of amateur radio is covered: transmitting, c.w., a.m., sideband, radioteletype; receiving; mobile; v.h.f.; propagation; antennas; construction; theory; charts; diagrams; transistors; vacuum tubes; station assembly and operation. The complete handbook!

$3.50 USA proper    $4.00 US Possessions and Canada    $4.50 Elsewhere
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The American Radio Relay League, Inc.
West Hartford 7, Conn.
is a noncommercial association of radio amateurs, founded 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 prerequisites, although full voting membership is granted only to licensed amateurs.

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816 Connecticut Ave., Washington 6, D. C.
"It Seems to Us..."

QRP, OM!

Amateurs in the United States are very fortunate in being allowed to run a kilowatt input to their transmitters — and we don’t even need accurate measurement of our power till we pass the 900-watt mark. Canadians, too, have relatively liberal power regs, being permitted 500 watts output (figuring a transmitter efficiency of 70%, this allows an input of some 700 watts), comparing quite favorably with the 100 to 150 watts input most countries permit. When one is trying to work some rare DX already being called by three layers of QRM, or when one has a full hook for a TCC sked, or is trying to knock off the fiftieth state on 6 meters, the extra juice really helps.

But it does seem downright ridiculous to use a full gallon in a state-wide traffic net, or to rag-chew with a buddy ten miles away. It seems especially silly to hear a couple of hams crying on each other’s shoulder about all the problems they have with adjacent-channel or fundamental-overload TVI — all the while running 50-Mc. rigs at maximum legal power, when over the distances being covered, one watt would produce an S9 signal!

For most c.w. and sideband rigs, power reduction poses little problem. Either the exciter can be run “barefoot” into the antenna, or the final itself adjusted for lower input. For big a.m. transmitters, it may be necessary to have a separate low-power rig sitting next to the “gallon,” but in only a few cases would this be a hardship.

What are the advantages? Less TVI, a lower electricity bill, and — most important — less QRM for all of us. We don’t have formulas at hand to prove it, but we’re willing to bet that a graph plotting interference complaints against the power of the transmitter being picked up, especially on v.h.f., would go something like this: 10 watts, no neighbors troubled; 100 watts, 2 neighbors; 1,000 watts, 16 neighbors! It is perfectly true that if a transmitter does not interfere with TV, BC and hi-fi sets of good design, its operator has no obligation to do anything about interference with sloppy sets, and if a ham needs to run high power to a clean transmitter to accomplish his objective, we would be the last to tell him to refrain. But when low power will do for the job at hand, doesn’t it make sense to avoid unnecessary chopping-up of a neighbor’s TV program, no matter how punk his receiver?

It also stands to reason that the bands can handle only so much useful r.f. at a time. Low-power stations can be received closer to each other without harmful mutual interference than can high-power stations. If amateurs all ran only enough power to do the job, would we not find the bands “wider”?

And now, the final argument — there is a little-known section in the Communications Act of 1934 which reads:

Section 324. In all circumstances, except in case of radio communications or signals relating to vessels in distress, all radio stations, including those owned and operated by the United States, shall use the minimum amount of power necessary to carry out the communication desired.

... QRP, OM!

DIRECTORS’ MEETING

Each May we customarily use a little space on this page to remind ARRL members that their Board of Directors will soon be meeting in Hartford, and thus if you have anything on your mind regarding our hobby or our League, now is the time to write your director. Consider yourselves so reminded for the 1960 annual meeting which occurs on May 13.

This year we’ll leave it at that, and use the rest of the space available for a look “behind the scenes.” Minutes of meetings are, by their very nature, restricted to basic facts. While the minutes accurately reflect (they had darn well better be accurate!) motions offered and either adopted or rejected, far more is accomplished by the annual affair than can be shown in such a document.

To begin with, directors have a chance to get better acquainted with each other, the officers, and the staff members. They look over the Headquarters, visit W1AW, inspect financial records, and ask questions and offer suggestions on any phase of League activities — the content of QST, the prices of publications, contest and awards administration, public relations, advertising policies, personnel relations, working-space problems and so on.

In conversations with one another, the directors are likely to discuss such things as ways of increasing membership in their divisions, making the work of volunteer officials easier yet more effective, stimulating interest in local radio clubs, improving participation in the Amateur Radio Emergency Corps and

(Please turn the page)
RACES, and the like. These discussions are mutually helpful, and occasionally spark an idea for an action next day at the formal meeting. On the other hand, sometimes a director will discover that a pet proposal he has brought from his division gets no support from amateur sentiment in other areas as expressed by his fellow directors, so he drops the idea, knowing that any proposal must have majority support on a nationwide basis for passage.

Yes, behind the eight, ten or twelve hours of formal meeting which will be reported line by line in QST, there are many more hours in which your director represents you at Hartford in the management of your organization, in addition to the time he spends on League matters during the rest of the year. It makes good sense to let him know your views!

**Hamfest Calendar**

**Connecticut** — The New London hamfest, sponsored by the Tri-City Amateur Radio Council, will be held May 14 at Ocean Beach Park in New London. Activities beginning at 8 a.m. include a YL meeting, FCC exams, a mobile contest, Connecticut phone net meeting and technical talks. Two other speakers are scheduled — one representing the North Pole and the other the South Pole. Tickets are by advance registration only and the event date is May 7. If you wish to attend the evening hamfest, the registration fee includes a roast beef dinner at 7 p.m. YLs may be registered for $4, including the dinner. Registrations only (no dinner) may be purchased at the door for $1.50. For advance registrations, contact Richard Darling, K1HYQ, 48 Main St., New London.

**Illinois** — The annual Mississippi Valley hamfest will be held at Moline in the Gra Ell picnic grounds, three miles east of the Quad City Airport on Route 6, on May 22. Noon lunch will be available for those who wish a warm meal and refreshments are available all day. There will be parking space and a nice shaded lawn for family picnics. Activities start at 7:30 a.m. Advance registration is $1.50 and must be obtained from R. E. Gardner, K9HYN, 1015 38th Street, Moline. Tickets at the gate will be $2.

**Illinois** — The Starved Rock Radio Club hamfest will be held on June 5 at the LaSalle County 4-H Home and Picnic area southwest of Ottawa (same grounds as last year). Float Route 23 to the south end of the Illinois River bridge at Ottawa, turn west on Route 71, following big yellow hamfest signs. There is plenty of space and adequate facilities for all. Free swap session. Advance registration is $1.00, and must be received by May 25. Registration at the gate is $1.50. The hamfest site is a short drive from the Starved Rock State Park and recreation areas. Food is available on the grounds. Free coffee and doughnut 1000 to 1030 CDT. For further information, contact George E. Keith, W9QLZ, RFD 1, Box 171, Oglesby.

**Indiana** — The Columbus ARC will hold a combination hamfest at Donner Park shelter house in Columbus on Sunday, May 22, from 1000 through 1600 CDT. Registration fee is $1.00. Adequate picnic facilities and refreshments are available at the park. For further information, contact Frank Reiser, W8AH, R.R. 2, Columbus, Indiana.

**Kansas** — The Hi-Plains Amateur Radio Club will hold its 11th hamfest May 15 at Plains, Entertainment is planned for XYLs and a basket dinner will be served at noon.

**Kansas** — The 19th annual CKRC hamfest in Kenwood Park at Salina, will open at 9 a.m. on June 5. Bring a covered dish and silver service for your own family. Soft drinks and coffee will be furnished by the CKRC. Everyone is welcome, but only licensed hams and their YLs or XYLs are eligible for registration. Registration fee is $1. For information, contact Buzz Deer, W5RAS, 857 Shawnee Ave., Salina.

**Kentucky** — The Kaw Valley Radio Club of Santa Fe, Kansas, will hold its annual Hamarama on May 22 at Lake Shawnee. There will be mobile and fixed stations on standby frequencies of 3920 kc. and 29.6 Mc, to guide out-of-towners. Starting time is 9 a.m. There will be mobile hunts on 75 and 10 with prizes for the winners. Bring auction sale material for a real ham auctioneer "that is the best a ham can do with another's ear." Bring a covered dish for the noonday meal. The club will serve coffee and soft drinks. There will be plenty of boat space for those who have boats and want to try the lake.

**Massachusetts** — The Massachusetts Phone Net will hold its annual spring meeting May 14 at Grandview Hall, 21 Grandview Ave., in Worcester, at 1 p.m. There will be discussions on traffic handling and net operations, overcall QSOs and refreshments. The meeting will adjourn to a local restaurant for dinner at 8 p.m. Registration fee at the door will be 50 cents; dinner will be an individual basis. Those planning to come are asked to contact W1DNS by May 12 on the Massachusetts Phone Net or at 26 Richards St., Worcester.

**Mississippi** — The Biloxi Amateur Radio Club will hold its third annual hamfest June 4-5 at the Community House in Biloxi. The program includes an open house and games with a Dutch treat supper on Saturday and a visible transmitter hunt and other events on Sunday. Main attraction will be the free shrimp boil Sunday noon. Tickets are $1. For information, write BARC, Box 1574, Biloxi.

**New York** — Rochester will host the Western New York hamfest May 14 at the David Liond Post on Buffalo Road. Free lunch will be available for members (v.f.o., DX and transmitter design plus contests in code transmitting and QSOs). Open house at the A.W.A.'s historical barn museum and an Old Timers' luncheon is scheduled at noon. Exhibits and registration start at 1 a.m. The hamnet is at 6:30 p.m. Registration will be $2.25 and dinner will be $2.75. Advance combination registration and dinner will be $4.50. Mail checks to Larry McConnell, K2UCI, 256 Pemberton Road, Rochester.

**New York** — The Rome Radio Club will hold its annual hamfest on June 5 at Beck's Grove. There will be good speakers, entertainment and food for all. Tickets are $4 for adults and $1.25 for children. For further information or tickets, write G. K. Dennison, W2XR, P. O. Box 184, Holland Patent, N. Y.

**Ohio** — The sixth annual Toledo Sideband Dinner is set for May 28 at Brall Hall on Alexa Road in Toledo. This affair is an informal reunion of sidebanders from a wide area. The hall will be open all day Saturday with dimnishing. Tickets are $4.50 each, with a choice of roast beef or chicken dinner. Reservations must be in and paid by May 15. Motel reservations can be made and confirmed in advance through K8ECE or W8ALP. Reservations are available from K8ECE, Ron Reed, Route 3, Tiffin or on the Interstate Sideband Net, 3983 kc. every evening at 2000 EST.

**Ohio** — The 1980 Dayton Hamvention will be held on **COMING A.R.R.L. CONVENTIONS**

April 30-May 1 — Oregon State, Portland.

May 1 — New England Division, Swampscott, Massachusetts.

June 4-5 — Southeastern Division, Atlanta, Georgia.

June 10-19 — West Gulf Division, Dallas, Texas.

July 30-31 — North Dakota State, Minot.

September 10-11 — Central Division, Indianapolis, Indiana.

September 16-17 — Quebec Province, Montreal.

October 7-8 — Great Lakes Division, Cleveland, Ohio.
The "Imp" uses a simple crystal filter and VXO frequency control to put a single-sideband signal on the 14-Mc. band. The 5 × 7-inch chassis shown in this photograph contains the entire r.f. and audio circuits of the exciter. Output from the 6CL6 amplifier is about 1 watt.

A Single-Sideband Exciter of Simple Design

BY JOSEPH S. GALESKI, JR.*
W41MP

The "Imp"—a 3-Tube Filter Rig

On occasion we've all heard the complaint "I'd be on s.s.b., but it's too expensive"—or "It's too complicated." Comments such as these, plus the desire to do a little experimenting with high-frequency crystal filters and VXOs, prompted the development of the "Imp." I needed an exciter with a minimum number of tubes to use as a laboratory for my experimentation.

The results have been most encouraging. The three tubes and filter generate a very acceptable s.s.b. signal, with variable frequency and a watt or so of output to drive a linear amplifier. I hope this article will inspire others to give s.s.b. a try.

For purposes of simplification this exciter is designed to operate only on 20 meters. However, by the proper choice of filter frequency, VXO crystal, and suitable modification of the three coils it can be made for any band. Components are readily obtainable on the surplus market and substitutions are quite in order where necessary. I was able to purchase crystals for less than twenty-five cents each. The modulation transformer can be any small plate-to-line unit with a turns ratio of about six or eight to one, such as the W2EWL type 1 or the output transformer from an ARC receiver. Suitable transformers are currently advertised in QST and other publications at a cost of less than one dollar.

Since my own station exciter is a version of George Bigler's "Sideband Package," 2 and since I had already won a war against its "bugs," I decided that George's basic circuit was a good starting point. It has worked out well.

* 4318 Hanover Ave., Richmond 21, Virginia.

When a single-sideband generator is stripped to essentials, there isn’t much to it; the complications pile on when assorted accessory equipment is added. Here’s a basic unit that will get you off to a good start on s.s.b. Built mostly from odds and ends of surplus, including the crystals, it doesn’t leave much room for argument on the question of economy.

Every effort has been made to keep circuits simple and with as few parts as possible. These circuits are not original with me and complete descriptions can be found in the handbooks. I have only adapted them to the Imp.

Circuit and Construction

The triode section of $V_1$, Fig. 1, is used as an untuned crystal oscillator to feed carrier to the diode balanced modulator. The pentode section of this same tube will deliver enough audio from a crystal microphone to upset the modulator balance and furnish a double-sideband signal to the filter, which passes only the upper sideband to the triode mixer, $V_{2A}$. The pentode section, $V_{2B}$, is a variable-frequency crystal oscillator which supplies the mixing signal to the grid of $V_{2A}$. About 10- to 12-ke. shift can be expected from an 8-Mc. crystal. The 6CL6 amplifier, $V_3$, uses tuned tanks in both the grid and plate circuits to provide adequate selectivity.

Construction is straightforward. A 5 × 7-inch chassis was used, with the filter mounted on top. A shield separates it from the VXO tuning cap.
Fig. 1.—Circuit diagram of the s.s.b exciter. Resistances are in ohms, fixed composition resistors are $\frac{1}{2}$ watt except as indicated. Fixed capacitors with polarities marked are electrolytic; others are ceramic. Power requirements are 6.3 volts at 1.6 amp. for tube heaters and 250 to 300 volts at 50 ma. for plates.

C1, C2, C3—4.5-25 μf. ceramic trimmer (Centralab 822-AZ).
C1—50 μf. per section (Hammarlund MCD-50-M).
J1—Cotx connector, chassis mounting.
L1—22 turns No. 22 enam. close-wound on 1½-inch diam. form. Modify as necessary to give desired VXO frequency shift.
L2, L3—22 turns No. 22 enam. close-wound on ¾-inch diam. slug-tuned form. L2 and L3 mounted side by side with ¾-inch spacing, center to center.
L4—20 turns No. 22 enam. close-wound on ½-inch diam. slug-tuned form.

L5—Output link, 5 turns same as L4 wound at cold end of L4.
R1—1000-ohm potentiometer, linear taper.
R2—500-ohm potentiometer, linear taper.
R3—1-megohm control, audio taper.
R4—25,000 to 50,000 ohms, 2 watts, as needed for swapping and for stabilizing the 6CL6 amplifier.

S1—S.p.s.t. mounted on R1.
S2—Rotary, single-throw, with additional poles as needed for controlling external circuits.

T1—Tuned winding: 60 turns No. 28 enam. scramble-wound to length of ¾ inch on ¾-inch diam. slug-tuned form. Primary winding: 8 bifilar turns on same form close to tuned winding.
T2—Each winding 50 turns No. 28 enam. scramble-wound to length of ¾ inch on ¾-inch form (no slug); windings spaced ¾ inch between adjacent ends.
T3—Plate-to-line audio transformer, approx. 20,000 ohms to 500-600 ohms (Stancor A-3250, ARC-5 receiver output, or similar).

Y1, Y2, Y3—5773.3 kc., surplus FT-243 type (see text).
Y4—5775 kc., surplus FT-243 type (see text).
Y5—8525 kc., surplus FT-243 type.
actor. A reasonable effort should be made to keep the circuits separated. If the unit is not to be put in a metal box, I would suggest putting a shield can over the carrier crystal and over the filter, because hand capacitance tends to throw the carrier balance out of kilter.

The selection of crystals for the filter permits a wide latitude of frequencies. However, the harmonics of the filter frequency and of the mixing frequency should be well removed from the desired 20-meter output.

Selecting Crystals

On the surplus market are several groups of 5- to 9-Mc. crystals that have a frequency difference of 1.7 kc. I obtained about ten at 5773.3 and ten more at 5775 for experimenting, but I now feel that for a similar project seven at 5773.3 and three at 5775 would be enough. While the crystals are marked as having these frequencies few of them are "on the nose," and you will find that they will differ from one another by as much as a kilocycle.

Mark each of the 5773.3 crystals with an identifying letter and determine the relative frequency of each by inserting them one at a time in the crystal socket of $V_1$ and tuning them in on your receiver. If your receiver covers only the ham bands, use a second crystal at approximately 8500 kc, in the VXO to bring the sum frequency to the 20-meter band. A difference in audio tone against the receiver b.f.o. will permit you to get the crystals in order of frequency from highest to lowest. Record this order by the letters previously marked on them.

Select two of the lower-frequency crystals of the 5773.3-ke. group having a separation of a couple of hundred cycles or so and call the lower one $Y_1$ and the higher $Y_2$. You will later use one of the remaining crystals of this group for $Y_2$. Use one 5775-ke. crystal for $Y_2$. Peak $T_1$ and the trimmers on $T_2$ with a 5775-ke. crystal at $Y_1$.

Circuit and Filter Alignment

The three tuned circuits, $L_2$, $L_3$, and $L_4$, can best be aligned by first removing both $V_1$ and the VXO crystal and then, with a signal generator set at 14,300 kc, connected to the grid of $V_2$, peaking the coils. An alternate method would be to use a 7150-ke. crystal in the VXO and peak the coils on its second harmonic. This procedure should be followed to avoid the possibility of alignment of the coils on a harmonic of the VXO or a harmonic of $V_1$.

Alignment of the filter is the next step, and a BC-221 frequency meter or other slow-tuning oscillator is necessary. I used a 221 on its low range, which gives approximately 30 dial divisions per kilocycle. Insert a crystal about 150 to 225 kc, lower than the passband frequency at $Y_1$; this would be in the 5550- to 5625-ke. range. Exact frequency matters little as long as the 221 output and the temporary $Y_1$ add to tune across the filter passband. A difference frequency may also be used if you remember that in such case increasing the 221 frequency decreases the resultant frequency.

Connect a capacitance of a few $\mu$F between the output terminal of the 221 and a shielded lead running to the arm of the carrier-balance potentiometer, $R_2$, which should be turned to one end of its rotation. Remove the 6CL6 from its socket and connect a lead from the ungrounded end of $L_2$ to your receiver antenna terminal. You should be able to get an S-meter reading on the 20-meter band. If the meter goes off scale, loosen the coupling between the lamp and the receiver until a mid-range reading is obtained. You are then ready to plot the passband.

Tune the 221 so that the output frequency of the diode balanced modulator, which is now acting as a diode mixer, sweeps across the filter passband. Keep the receiver in tune with the signal and observe the action of the S meter. It takes a little practice, but after a few moments of using one hand on the receiver and one hand on the frequency meter this process becomes quite easy. You should be able to observe a definite increase in S-meter readings within the passband and a decreased reading outside of the passband.

Behind the panel. Most of the parts are from surplus. $L_1$ is in the can (from a roll of film) at the upper left. Following down along the left edge of the chassis are the output tube, $V_4$, the mixer-amplifier coupling coils, $L_2 L_3$, and the mixer-VXO tube, $V_5$. The VXO crystal is alongside the tuning capacitor, which is 100 $\mu$F per section with 100 $\mu$F fixed in series with each section to give the 50 $\mu$F specified in Fig. 1. $T_6$ is on the coil form at the left near the rear edge of the chassis; its associated trimmers, $C_6$ and $C_7$, are mounted on the shield alongside. The filter crystals and $T_7$ are also near the rear edge of the chassis. The carrier crystal is at the right in the far corner; $V_7$ is alongside, followed by the audio output transformer $T_8$, and, in the lower right-hand corner, the carrier balance control, $R_2$. $C_1$ is adjusted through the hole in the rear wall of the chassis at the right.

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Using a sheet of graph paper, plot the 8-meter readings on the vertical scale against 500-cycle dial settings from the 221 calibration book on the horizontal scale. Run a series of points and sketch in the curve. After you have plotted one or two of these curves you will be able to visualize what happens to the passband by watching the 8-meter action after each adjustment of the filter trimmers. It will only be necessary to plot the final curve for your records.

The filter passband of the Imp is shown in Fig. 2. It has a very sharp cutoff on the low-frequency side and is suitable as a filter for the upper sideband for transmission, but is too wide for receiving purposes. The curve has a dip and a bump or so, but they do not seem to affect the speech quality too adversely. Final filter adjustment will be a compromise between flatness of passband and maximum suppression of the unwanted sideband.

**Carrier Balance**

There should be little trouble with the carrier balance. If the trimmer, $C_1$, does not add to the carrier suppression that can be obtained by adjusting $R_5$, connect it at the other diode. This is a matter of cut and try. You will find that different crystals at $V_1$ require different settings of $R_3$ and $C_1$. Any r.f. indicator, such as an r.f. probe and v.v.m. or a receiver S meter, can be used for setting the balance. Be sure $S_1$ is closed.

Selecting $V_1$ is also a bit of cut and try. If its frequency is too low you will find that the sideband suppression is excellent, but the signal is difficult to copy because the low voice frequencies are cut off by the filter. If it is too high, the signal will sound fine, but you've lost suppression of the unwanted sideband. Don't be afraid to move the frequency around a bit by loading the crystal with a pencil mark. The final frequency of $V_1$ should be as low as possible consistent with good voice quality.

**Other Bands**

Operation on other bands may be accomplished by using this same filter. For example, lower-sideband output at the high-frequency end of the 75-meter band can be realized by (1) replacing the VXO r.f. plate choke with a parallel-tuned circuit at 9760. (2) using a 4880-ke. VXO crystal, and (3) changing $L_2$, $L_3$, and $L_4$ to tune to 3980 ke. You could leave the plate choke alone and obtain a fundamental crystal at about 9760 ke.

In any frequency combination that may be used, the sum of the filter frequency and the mixing frequency gives output on the original (in this case the upper) sideband. Subtracting the mixing signal from the filter frequency will still give you upper-sideband output. However, if the sideband filter frequency is subtracted from the mixing frequency, a reversal will occur and the output will be on the lower sideband.

I made an attempt at 15 meters using a 7825-ke. crystal, doubling in the VXO tank to 15,650 to give exciter output at about 21,423. It worked fine except that $L_2$, $L_3$, and $L_4$ did not give sufficient selectivity for adequate attenuation of the third harmonic of 7825 ke. Construction of a filter at about 4125 will permit using an 8650 crystal for better rejection of harmonies in the tuned circuits.

Build an Imp around any group of crystals you may have, but watch out for the harmonics. See you on s.s.b.!

**Results and Afterthoughts**

I have had the rig on the air with an amplifier, and while adequate drive is not available for my Thunderbolt, the Imp will drive a 6146 or 6DQ5 quite well. Carrier and sideband suppression are quite good. W4LYC describes it as sounding "like a well-adjusted phasing rig." I worked a number of Ws, T12HP, and ZS8AQ, with the Thunderbolt tied on and doing the best that it could. The VXO could probably be replaced with a v.f.o., but I have not tried it. It is quite stable with the crystals and there is no detectable drift in operation.

I would like to say here for the benefit of those without access to a BC-221 that they should not lose heart. Any existing v.f.o. can be used if it is given additional bandspread with a trimmer so that a 180-degree turn of the dial will cover about 10 ke. It doesn't even have to tune the

The large coil is $L_1$, in the VXO circuit. Knob-adjusted controls are, left to right, carrier insertion, audio gain, and operate switch. The microphone jack is between the latter two. The extra contacts of the operate switch, $S_2$, are brought out to the terminal strip on the rear edge of the chassis. These can be tied in with a linear amplifier and other accessory equipment as the operator may desire.

QST for
filter frequency. Use the heterodyne principle as described above with the BC-221. After all, in this case we want to know only that the passband has the desired shape. A VXO on a separate chassis could also be used.

Since only one crystal, \( Y_3 \), is needed for the higher channel, all filter crystals may be purchased for the same frequency and a couple etched or ground up \( 1\frac{1}{2} \) to 2 kc. This job is easier to do than one can imagine. Refer to your handbooks. Of course, commercial high-frequency filters are available that will do a beautiful job, but this makes the task too simple and we side-banders will lose our "exclusiveness."

The three tubes and two diodes are the best that I could do. Anybody for a two-tube exciter? A triple triode is available!

My thanks to Art, ZS6AQQ, and Myron, W4YCY, for their encouragement and ideas for this little rig.

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**FEEDBACK**

The "Self-Contained Portable Station for 50 Mc. (March QST, page 11) is bringing in plenty of mail. Some of this indicates that readers don't read very carefully. About a dozen letters ask for a 2-meter version, despite a statement on the first page of the article giving the reasons for using 50 Mc. instead of 144 for this kind of work.

Several inquiries concern the TAF4 tubes. Ours were made by Sylvania, and obtained from a local radio parts store. They are among the newer filament-type tubes, but have been made for several years.

Some ask about the small transformers. Don't worry if you don't find exact duplicates of those used in the article. There are many makes of transistor transformers on the market. The impedance values are not too critical. Anything roughly approximating the impedances given under Fig. 1 should be satisfactory.

Sharp-eyed WSYCF asked if there isn't a continuous drain on the transistor battery, with the circuit as shown, even with \( S_2 \) open. We blushingly admit that there is — though it is not a serious matter. After more than four months with the batteries connected the penlite voltages are 10 and \( 7\frac{1}{2} \) respectively, in place of the original 12 and 9 volts, and there is still plenty of audio available. If you want to get rid of the 200-microampere drain, return the 1500-ohm resistor in the receiver to the plus side of \( S_{2A8} \), rather than to ground.

There is a dimension error in Fig. 2. As shown in the diagram, the two small chassis are \( 1\frac{1}{2} \) by \( 3\frac{1}{4} \) inches after bending. The large surface should be \( 3\frac{1}{4} \) inches long, not \( 3\frac{3}{4} \) inches.

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The crosstown QSO of K9ORP, K9MBS and K9MBR was monitored by KN9SVV... on his TV set.

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WA1CTW/W1IQD recently worked a KP4 on 50-Mc. phone. So what, say you? Well it so happens that Cal has been an active amateur since 1924. He has a country total of 164 on 21 Mc. He has been a leading New England v.h.f. enthusiast since the earliest days of activity on 5 meters — but this 6-meter contact with Puerto Rico was his first phone QSO outside the United States and Canada.

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Additional copies of the Golden Jubilee yearbook of the Radio Club of America, published earlier this year, are available at $4.50 per from the Club at 11 West 42nd St., New York 36, N. Y.

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When WA2HRD QSOd W2CTH, W2CTH said this was his 100th contact on 6 meters. WA2HRD checked — it was his 100th on 6 too.
Harmonics, Harmonics, Harmonics

How To Keep Them off the Air

BY LEWIS G. MCCOY,* WI1CP

DEAR MR. NEWLY-LICENSED NOVICE: WHETHER you're aware of it or not, you must face the fact that precautions must be taken to prevent radiation of harmonics from your transmitter. If you don't, you're likely to find yourself in violation of FCC regulations. It isn't safe to assume — or hope — that you don't have harmonics. If you escape getting a ticket for a while it may just be because FCC monitors didn't happen to check at times when you were on the air.

There are several methods for getting rid of harmonics. This article will treat a simple, inexpensive cure. However, before discussing the "how" let's talk about the "why" for a minute.

Harmonics

What you want from your transmitter is a signal in which all the output power is on one frequency only. Unfortunately, transmitters don't generate that kind of signal. In addition to the desired frequency, called the "fundamental," there are always other frequencies present. These frequencies, called "harmonics," are simple multiples of the fundamental frequency. For example, if your fundamental is 3710 ke., you'll have a "second" harmonic at twice 3710, or 7420 ke., a "third" harmonic at three times, or 11,130 ke., and so on. When these frequencies are radiated by the antenna they may cause interference to other radio services because, for the most part, they don't fall in amateur bands.

Where most Novices get into trouble is with the second harmonic from 80-meter operation. There are numerous commercial services in the region around 7450 ke., and there are often times when it doesn't take much of a harmonic from your station to interfere with the reception of one of these commercial stations.

How Bad Are Your Harmonics?

There is no simple method for determining whether your harmonic radiation may cause harmful interference. You can have another ham listen for your harmonics; if he hears them at all you know you have to do something about them, but unfortunately the converse isn't true: the fact that another ham cannot hear a harmonic from your station doesn't mean you are clean. The only safe assumption to make is that your transmitter is bound to have harmonics, and then take precautions to prevent them from reaching the antenna.

Many of the antennas in use on 80 and 40 are of the trap type with coax feed. In this type of installation the coax feed line is usually connected directly to the transmitter. In such cases you can be practically certain that harmonics will reach the antenna and be radiated. Another common system is the off-center feed antenna, usually fed with 300-ohm Twin-Lead, connected to the transmitter through balun coils and coax. Here again there is nothing to prevent harmonics from reaching the antenna.

Whether you use the antenna

The two-band filter for coax lines; 80-meter filter at left, 40-meter filter at right. The coils in each filter are self-supporting and are oriented with their axes at right angles.

QST for
Fig. 1—Circuit of the half-wave filter. A single set of circuit constants, as given below, will serve for one Novice band, but different filters must be used on different bands.

$$C_1, C_2 = 3.5 \text{ M\text{c}}; \quad 820-\mu\text{f, mica, 500 volts.}$$
$$7 \text{ M\text{c}}; \quad 470-\mu\text{f, mica, 500 volts.}$$
$$21 \text{ M\text{c}}; \quad 100-\mu\text{f, mica, 500 volts.}$$

$$C_3 = 3.5 \text{ M\text{c}}; \quad 1500-\mu\text{f, (0.0015 \mu\text{f}) mica, 500 volts.}$$
$$7 \text{ M\text{c}}; \quad 1000-\mu\text{f, (0.001 \mu\text{f}) mica, 500 volts.}$$
$$21 \text{ M\text{c}}; \quad 2000-\mu\text{f, (0.002-\mu\text{f}) mica, 500 volts.}$$

$$J_1, J_2 = \text{Phono jacks.}$$

systems just mentioned or some other type, as long as you don’t have an antenna coupler or some type of filter in the feed line you should take precautions against harmonic radiation. Some amateurs think that a low-pass filter for TVI will protect them against all kinds of harmonic radiation. A TVI filter will help attenuate harmonics in the television range, but it won’t do a thing for the low-frequency harmonics that interfere with other commercial services.

Usually you can consider yourself safe if you have an antenna coupler following the transmitter. The coupler provides enough selectivity to keep the harmonics from being radiated. However, many amateurs don’t like to use a coupler because of the additional adjustments required when changing bands. There is another approach to the problem of harmonic attenuation, and that is the use of a filter installed in the coax feed line. The filter is a fixed device that doesn’t require adjustment or tuning once it is constructed.

**Half-Wave Filters**

A “half-wave” filter is a special type which has the unique property that it doesn’t have to be “matched,” because whatever impedance may be connected to its output side will automatically be repeated at its input terminals. This means that such a filter can be inserted in the feed line without changing the load on the transmitter; except for the fact that it attenuates harmonics such a filter has no effect on the operation of the transmitter and antenna.

The half-wave filter is not critical of the standing-wave ratio on the line. A single design will work equally well with either 50- or 70-ohm coax and will tolerate mismatches of approximately 3 to 1. This limit is not due to any theoretical limitations in the filter itself, but is because of the limitations of the components used. With a large mismatch the currents or voltages in some parts of the filter may exceed safe values for the coils and capacitors.

The only drawback, and it is not a serious one, is that a separate filter is required for each band. This means the filter must be changed when a different band is used. However, this can be taken care of by installing phono-type plugs on the feed line and phono jacks on the filter. It is impracticable to use a switch to change filters because of the danger that harmonics will leak around the switch connections through stray capacitance and reach the antenna. It only takes a few seconds to change filters with the plug and jack system.

**Making the Filters**

The assembly shown in the photograph consists of two half-wave filters, one for 40-meter operation and the other for 80. A coffee can makes an inexpensive container for the filters, and also offers excellent shielding. Both filters use the circuit shown in Fig. 1.

The first step in building such a filter is to cut a shield from another tin can. The shield runs through the center of the coffee can and is soldered to the can at the sides and bottom. This separates the can into two shielded compartments.

Next, mount the phono jacks in place. These are installed approximately 1 1/2 inches from the bottom of the can and about 3/4 inch either side of the shield. The jacks can be installed by soldering them directly to the can, or else screws and nuts can be used.

The coils $L_1$ and $L_2$ are made from a single length of B & W Miniductor coil stock. See Fig. 1 for details on coil sizes. When cutting the coils from the original stock allow approximately 1 1/2-inch lead length on each coil.

Note in the photograph how the coils are mounted at right angles to each other. This is done to minimize coupling between the coils. The ground leads to the mica capacitors are soldered directly to the can, and their other leads go to $J_1, J_2$ and the junction of $L_1 L_2$, respectively. After assembly, replace the lid to complete the shielding.

Of course, if you plan to operate only on one band there is no need to make two filters. In such a case the internal shield can be omitted.

The half-wave filter attenuates all harmonics higher than its operating frequency and so is also useful in attenuating harmonics that could cause TVI. However, if you already have a TVI low-pass filter installed in your setup it can be left in place when the half-wave filters are used. Actually, there is no need to build a half-wave filter for 15-meter operation if you’re already using a low-pass filter since the latter serves the same function.

**Remember:** Be sure to change filters when changing bands. If you don’t you may blow out the mica capacitors.

May 1960 17
Simplest is best," is a good slogan to keep in mind when preparing an antenna system for Field Day. Or, for that matter, for any portable operation.

With some help from George Salf, W9BDM, the author constructed the v.h.f. antennas and supporting mast for the local club's 1959 Field Day. This article deals with the construction of the mast and the means employed for rotating the antennas. Little comment is made about the antennas, since there are many good beams described in the ARRL Handbook and QST. Almost every amateur has his own preference in the antenna department.

It was decided not to use an electrically-operated rotator, since electric power is at a premium on Field Day. As it worked out the Armstrong method was quite satisfactory. This type of rotator is the cheapest and most readily available. For those unfamiliar with the Armstrong rotator, it is the same as turning by hand.

Construction Details

For the mast, three wood poles 8 feet long were used, the combined height being 24 feet. These poles are approximately 1 3/4 inches in diameter and came from a convention display booth. Poles like these are readily available at your local lumberyard or, in some areas, come with rags rolled on them. The 8-foot length was chosen because it permits carrying the mast, when collapsed, inside a station wagon. The simplest type of portable and Field-Day antenna mast is the one you can carry around with the least amount of trouble.

The three poles are butted together and joined by sleeves consisting of 1-foot lengths of 1 1/4-inch pipe. The wood poles were whittled and sand-papereed until they fitted tightly into the ends of the pipe. With the poles inserted into the pipes, holes were drilled and 3/8-20 bolts passed through the pipe and pole to keep the poles from slipping in the pipe. To disassemble the mast, the bolts are removed and the entire mast reduces to an 8-foot bundle. From the photographs, it can be seen that the top 8-foot pole section is used as the mast for the 2-meter and 6-meter beams. The entire mast is guyed at the pipe coupling just below the top pole, at 16 feet above ground.

Guying and Rotating

The mast rotates by means of a unique and inexpensive slip ring. The top 1-foot section of pipe coupling was threaded at its upper end, and a 2-inch-to-1 1/4-inch pipe reducer was screwed on. With the 2-inch end of the reducer upward, the top wood pole easily passes through the reducer and into the 1-foot pipe. The wide lip on the 2-inch side of the reducer acts as the bearing surface for the slip ring. The slip ring is a 1 1/2-inch wall flange. The hole through the middle of this flange is actually about 1 3/4 inches and easily fits over the wood pole and rests on top of the reducer. The flange has four equally-spaced holes in it where guy ropes may be attached. The guy ropes hold the wall flange rigid as the mast turns. The friction between the wall flange and the wide lip of the reducer was found ample to keep the beams and mast from turning in the wind. All pipe fittings used are readily available at your local hardware store, as is the clothesline rope we used for guy lines.

I would suggest that if you build a similar type of rotating mast with more than three poles, you

The wood sections of the mast are coupled together with sections of pipe secured by bolts. This detail view also shows the pipe reducer and wall flange mentioned in the text.
This view shows the mounting of the two antennas and the guy-rope bearing.

should add additional slip rings and guys at the middle to keep the mast from bowing. The additional slip rings can be made in like manner.

**Antennas**

For 6 meters the author used a 3-element beam. The elements are aluminum tubing and quickly unfastened from the mast boom by removing two bolts in each. The boom is attached to the mast by a U bolt. This type of construction permits the entire 6-meter beam to be reduced to a small flat package. There are many good commercial beams available that can be used, but keep in mind that the simplest are the easiest to take apart and transport to the portable site.

For 2 meters, an 8-element collinear broadside beam was built. This, like the 6-meter beam, is a familiar type of antenna and is described in the *Hambook*. The only point of interest is the method of attaching it to the mast wood. The crosspieces, each supporting two bays, consist of strips of 1 X 1-inch board spread 1 3/4 inches apart. Bolts on either side of the mast, through the strips, clamp the strips tightly to the wood mast. Wire was used in the phasing section between the upper and lower bays so that the beam would lie flat when removed from the mast, and so the phasing section would not have to be disconnected when disassembled. A coax fitting was soldered in the feed line just below the balun to permit easy removal of the feed line when not in use.

**Summary**

This rotating mast and antenna system worked even better than expected. As anticipated, there was never a lack of available hams to run over and swing the beam. The 21-foot mast was found to be ample for the beams, considering the ideal hilltop location the CSRA club used last year. The complete installation of beams, mast, guys and feed lines was completed in less than 15 minutes. All of the parts were easily carried to the Field-Day site inside the author's station wagon.

In conclusion, the antenna system was simple to build, easy to assemble and put up and, best of all, operated with no difficulty. All of the materials are available at your local lumberyard or hardware store, if not in your junk box, and the total cost is low for an installation of this caliber. Once again, I believe that “Simplest is best,” is a good slogan for Field Day.

### New Apparatus

**Six-in-One Chassis Punch**

The problem of storing and using several different sizes of chassis punches can be solved by using a 6-hole chassis punch manufactured by Punches, Box 415, Toledo, Ohio. With this tool, holes of 1/8, 1/16, 1/32, 1/32, 1/32 and 1/32 inches can be cut in aluminum chassis.

The photograph shows an exploded view of the tool along with assorted punches and dies. The large cylinder at the left is the die holder. Next to it is the die, punch, locating pin and the driver which doubles as the 1/4-inch punch. Before using the tool it is necessary to drill a 1/4-inch pilot hole in the chassis. The desired die is then placed in the die holder and lined up with the pilot hole in the chassis, after which the locating pin is inserted through the pilot hole and down into the die holder. A punch of the proper size and the driver are next placed over the locating pin, and a few blows with a hammer on the driver forces the punch through the chassis.

When assembled, the punch measures about 6 inches high and about 1 3/4 inches in diameter. It is mailed in a strong cardboard tube with a metal screw-on cap which makes a handy container for storing the tool.

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*E. L. C.*

May 1960
S.S.B. on 144 Mc. with the T-23/ARC-5

BY LEROY W. MAY, JR.,* W5AJG

The T-23/ARC-5 has been a popular v.h.f. transmitter for years. Here we have a modification of the unit that permits use of its last two stages as single-sideband mixer-amplifier. It delivers enough power to be effective on its own, or it may be used to drive a kilowatt amplifier. At W5AJG it is used as an exciter for all classes of 144-Mc. service, driving a pair of 4X250Bs at 600 watts input on a.m. phone and 1 kilowatt on c.w. and s.s.b. The conversion described was worked up for the Air Force MARS Central Technical Net, Texas Division.

Several methods can be used to convert the T-23/ARC-5 to s.s.b. service. If only low s.s.b. output is wanted, the last 832A stage can be modified for mixer service. This will give enough output to drive a tetrode linear amplifier to several hundred watts, but it is not recommended unless some form of high-Q tuned circuit is inserted between the mixer and the amplifier, in order to hold down the level of spurious drive applied to the final stage. If the first 832A is used as the mixer and the second operated as a linear amplifier more output will be obtained, and the selectivity of the additional tuned circuits helps keep down the level of unwanted mixer products.

The s.s.b. exciter can be anything that will deliver a few watts. With the arrangement shown the s.s.b. excitation is on 21 Mc., though it could be on other amateur frequencies if the heterodyne frequency is suitably altered. The higher the s.s.b. frequency, the easier it is to get rid of the unwanted products. Injection of the s.s.b. energy was tried in the control grid, the screen and the cathode of the first 832A, with very little difference in results. Cathode injection is shown in Fig. 1.

Probably the simplest way of obtaining the heterodyning energy is to build a separate unit, rather than attempt to modify the 1625 oscillator and multiplier stages in the ARC-5. In this way the original stages can be left more or less intact, and the unit can be put back into service in its original form with a minimum of trouble. A 2-tube oscillator-multiplier circuit is shown in Fig. 1.

The screens of the 832As are run from a regulated source. This can be drawn from the supply for the plates. The oscillator and multiplier

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Fig. 1—Circuit of the ARC-5 v.h.f. transmitter, as converted by W5AJG for 144-Mc. s.s.b. operation. Three-figure part numbers indicate original components. Capacitor values are in μf. Resistors are ½ watt unless specified.

Jt—Coaxial chassis fitting, 50–239.
J1, J2, J3—Tip jacks for metering.
L1—10 turns (total) No. 18 tinned, ½-in. diam., ½ inch long, each side of center tap. Space ½ inch at center. Mount on ceramic bar in ARC-5.
L2—2 turns insulated hookup wire, inserted at center of L1. Twist leads to run to Lo.
L3—12 turns No. 26 enam., ½ inch long on ½-in. slug-tuned form.
L4—4 turns No. 22 tinned, ½ inch long on ½-in. slug-tuned form.
L5—6 turns like L4.
L6—2 turns like L5, at cold end of L5.
RFC, RFC2—V.h.f. r.f. choke.

20 QST for
stages are also fed from the 400-volt source, through dropping resistors.

Stability can thus be improved if the oscillator plate voltage is obtained from a separate source, and the oscillator is allowed to run all the time. Some users employ a simple selenium rectifier supply, with its output regulated at 105 volts for this purpose, instead of drawing the oscillator, multiplier and amplifier voltages from the one supply, as shown in Fig. 1. Another advantage of this arrangement is that it enables the operator to v.f.o. in on the frequency of a station without putting a signal on the air. Using a 10B or 20A as the oscillator position and with the oscillator running all the time, enough mixing takes place to make a signal audible in the receiver, even with no plate voltage on the other stages.

Bias for the second 882A is obtained by rectifying the a.c. line voltage. A 50,000-ohm potentiometer controls the output voltage from the filter. It can best be set by watching the pattern on an oscilloscope.

**NEW BOOKS**


Although written primarily for the service technician, this book also contains information of general interest to the amateur, such as the problems encountered in repairing printed-circuit boards and the treatment and salvaging of transistors, and contains a data table on the latest transistors and their characteristics. The nine chapters in the book cover transistor fundamentals, servicing transistor radios, automobile radio tests and measurements and transistor circuits. The last chapter is full of practical diagrams for transistor receivers — superhet, t.r.f. and regenerative. The book also includes interchangeability charts and a dictionary of transistor terminology. — E. L. C.


A comprehensive work of several contributors, this book covers semiconductor devices and their applications. Written for the student as an introduction to the junction transistor, it includes the physics of p-n and p-n-p structures and design of circuits around the transistor. Typical chapters include information on direct-current biasing and audio-frequency amplification, class C amplification, sinusoidal oscillators, amplitude modulation and demodulation, and transistor d.c. converters. The book ends with an appendix of transistor measurements and a very complete index. It is especially useful for those who are concerned with the design of transistor circuits. — E. L. C.


This book begins with an introductory chapter on the physics of transistors but from there on deals mostly with transistor applications. In fact, the bulk of the book is devoted to showing how to find such quantities as input resistance, stage gain, optimum load, power output, values of coupling capacitors and transformer-winding inductances. Illustrated with numerical examples, the mathematics is restricted to simple algebra. The book also contains details on transistor relaxation oscillators, photosensitive devices, superhet receiver design, amplifiers and bias stabilization. — E. L. C.


Here is one book is information on historical background, manufacturing techniques, basic circuit design and testing procedures for judging quality of new and used metallic rectifiers and crystal diodes. The application section gives circuits with explanations of such devices as modulators, battery chargers, power supplies, suppressor circuits, limiters, clippers, meters and measuring circuits. There is a comprehensive appendix with useful information on standards for coding industrial dry disc rectifiers, and a complete listing of silicon and germanium diode specification data. — E. L. C.


The author of Shortwave Propagation is in charge of frequency and propagation matters for Radio Free Europe, and his considerable experience in the field is evident in his practical approach to the subject. The book is written at just the right level for the amateur interested in ionospheric propagation — not garnished with technicalities principally of interest to the physicist and engineer, but not at the opposite extreme of popularization without real information either.

There is of course the usual background material — necessary for an understanding of the subject — on the ionosphere, on radio waves, on sunspots and the sunspot cycle, all treated in language that is easy to follow. The section on ionosphere measurements introduces the ideas that are important to the detailed understanding of ionospheric propagation, leading to the use of ionospheric charts and predictions for the determination of maximum usable frequencies and optimum working frequencies. The calculation procedure for distances shorter than the maximum one-hop, generally neglected in amateur literature, is also included.

Of special interest to QST readers are chapters on amateur contributions to knowledge of wave propagation and a forecast — advanced with admitted caution — of probable amateur-hand conditions during the coming sunspot cycle. Throughout the book the reader is introduced to various interesting aspects of propagation: one-way skip, for example, scatter, meteorics, auroral effects — all the things that hams continually encounter in everyday operation. It would be hard to find a question about propagation in the 3-30 Mc. region — at least the type of question that an amateur would ask — that isn’t covered somewhere in this book, even if only (of necessity) by the statement that the answer hasn’t yet been discovered. — G. G.
Measuring Small R.F. Voltages

A Vacuum-Tube Voltmeter R.F. Probe

BY KENNETH C. LAMSON,* WIZIF

If you own a vacuum-tube voltmeter—a basic test instrument that is indispensable for anyone doing his own experimenting—and haven't equipped it with an r.f. probe, it's probably just because of neglect, not cost. Even so, the probe described here is cheaper to make than any probe kit you can buy. It's a bare junk box that won't supply most, if not all, of the parts.

A useful addition to the test gear of any ham who does experimenting is an r.f. probe. It has numerous applications, ranging from measuring oscillator injection voltage in a mixer stage to measurements on transmission lines. All r.f. probes have a common purpose—detecting and rectifying an a.c. voltage and delivering a proportional d.c. voltage to a vacuum-tube voltmeter. There are several types of rectifying probes, variously designed to read peak-to-peak, peak, or r.m.s. a.c. voltages at frequencies as high as 3000 Mc.

Either a vacuum-tube or crystal diode can be used as the rectifier. Vacuum-tube diodes can handle larger amplitudes of a.c. voltages than crystal diodes, and, in general, probes designed using vacuum-type diodes offer higher input impedance. However, the vacuum-tube probes have several drawbacks; they are relatively large and cumbersome, require heater and plate supplies, and usually have relatively high shunt capacitance. The use of a crystal diode instead of a vacuum tube simplifies probe construction, eliminates the need for a filament and plate supply, reduces shunt capacitance, and allows the finished probe to be more compact and lighter than would be possible using a vacuum-tube rectifier.

The probe shown in the photograph and schematically in Fig. 1 is of the peak-indicating, shunt type—so named because the diode is shunted across the circuit being measured—and uses a 1N34A germanium crystal diode rectifier.

*Circuit Operation

A probe of this type has definite limitations, and in order to appreciate them it is necessary to understand how the probe functions. The operation of the r.f. probe is analogous to that of an ordinary half-wave rectifier-filter combination, converting an a.c. input voltage to a pure d.c. output voltage. Referring to Fig. 2, assume that the a.c. input voltage is sinusoidal. Initially, when the voltage rises from zero and approaches its peak positive value (at point X) the diode conducts and the input capacitor \( C_1 \) charges through the low forward resistance of the diode to approximately the peak voltage. When the input voltage decreases from its peak value toward zero, \( C_1 \) begins to discharge through the series combination of \( R_1 \) and \( R_2 \), the latter being the vacuum-tube voltmeter's input resistance. \( C_1 \) continues to discharge throughout the rest of the cycle, through \( O \) to \( Y \) in the negative direction and back to \( O \) again, but if the time constant^1 of the circuit is large compared with the time of one a.c. cycle the capacitor will lose only a small part of its charge. Thus when the input voltage again goes in the positive direction the diode is back biased, and cannot conduct until the amplitude of the input voltage exceeds the potential of the partially-discharged capacitor. In each succeeding cycle, as the input voltage

\[1\] See The Radio Amateur's Handbook, chapter on circuit fundamentals. The time it takes for a capacitor to lose 63.2 per cent of its initial potential is defined as the time constant. The time constant in seconds is equal to the product of the capacitance in \( \mu \)f. by the resistance in megohms. The smaller the RC product the less time it takes for the capacitor to discharge.
nears its maximum positive value and overcomes the voltage stored in \( C_1 \), the diode conducts and \( C_1 \) again charges rapidly through the low forward resistance of the diode.

Theoretically, \( R_1 \) and \( R_2 \) should be the only discharge path for \( C_1 \); however, in the practical case — and particularly when crystal diodes and not vacuum tubes are employed — it is possible for \( C_1 \) to discharge partly through the back resistance of the crystal diode. The back resistance is normally about 1000 times the forward resistance, but is generally small compared with the sum of \( R_1 \) and \( R_2 \). Thus the time constant of the circuit actually is determined principally by the crystal back resistance.

Realizing basically how the probe functions, it should be evident that at some low input frequency the applied voltage will not change rapidly enough to keep the input capacitor \( C_1 \) charged to approximately the peak voltage over the whole cycle. In other words, \( C_1 \) will have time to discharge more than it should, and the average d.c. voltage from the probe will be proportionally reduced. This will cause erroneous readings, limiting the usefulness of the probe at low frequencies. For satisfactory operation the time constant of the circuit (\( C_1 \) times the back resistance of the diode) should be 25 to 100 times as long as the time of one cycle of the lowest desired a.c. input frequency, values toward the higher figure being preferable. The actual back resistance of the diode is dependent on the applied voltage, but an average figure of 150,000 ohms can be used for general calculation purposes. Thus, for the circuit shown in Fig. 1 the lowest usable frequency of the probe is approximately:

\[
f = \frac{100}{R_0 C_1} = \frac{100}{0.15 \times 0.01} = 66,700 \text{ cycles or 66.7 kc.}
\]

where \( f \) is the frequency in cycles per second and \( R_0 \) is the crystal back resistance in megohms. Increasing the capacitance of \( C_1 \) will extend the lower frequency limit of the probe.

The upper frequency limit for a probe of this type is approximately 250 Mc. The mechanical design and construction can markedly influence the performance of the probe in this respect. Long leads and wiring in which no attention is paid to stray capacitance will considerably reduce the over-all effectiveness of the probe at the higher frequencies. At high frequencies it is also essential to provide short, low-inductance r.f. connections to the test circuit. A flexible copper-braid grounding strap will provide a low-inductance return path. In general, at the upper frequencies the usefulness of the probe is limited mostly to detecting the presence of r.f. voltages and comparing relative amplitudes, rather than in making accurate quantitative voltage measurements.

The capacitor \( C_1 \) charges to the peak amplitude of the applied voltage, as described earlier, but usually it is desired that the r.m.s. values of the voltage be indicated. To do this automatically, it is necessary to set up a resistance voltage divider to convert peak to r.m.s. The r.m.s. value of a sine wave is 0.707 times the peak, and therefore this ratio is used in the voltage divider, the resistance across which the d.c. voltage is measured being 0.707 times the total resistance; that is,

\[
\frac{R_2}{R_1 + R_2} = 0.707
\]

where the circuit is as shown in Fig. 2. The probe described here is designed to be used with any of the several "11-megohm" vacuum-tube voltmeters on the market (the actual input resistance of these meters is 10 megohms since the d.c. probe contains a 1-megohm isolating resistor). Solving the equation gives \( R_1 = 0.114 R_2 \), and substituting 10 megohms for \( R_2 \) yields 4.14 megohms for the value of \( R_1 \). Keeping in mind that the average of the charge on \( C_1 \) is not quite equal to the peak of the input voltage, the actual value for \( R_1 \) should be chosen slightly smaller than the calculated value. In this case a value of 3.9 megohms is not only sufficiently accurate but also allows the builder to use a standard resistance value.

**Construction**

The unit shown in the photograph and schematically in Fig. 1 is similar in circuitry to most of the conventional peak-indicating, shunt-type commercial r.f. probes. However, it can be constructed for considerably less than the cost of a commercial unit. If all parts, including the r.f. probe is used in conjunction with a vacuum-tube voltmeter. The case of the probe shown here is constructed from a 7-pin ceramic tube socket and a 2 1/4-inch tube shield. A half-inch grommet at the top of the tube shield prevents the output lead of the probe from chafing. The flexible copper-braid grounding lead and alligator clip provide a low-inductance return path from the test circuit. The d.c. output of the probe goes to the phone plug, which plugs into the d.c. input jack of the v.t.v.m.

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Close-up of the inside of the probe. The 1N34A crystal diode rectifier, calibrating resistor, and input capacitor are mounted tight to the terminal strip with shortest leads possible. Spaghetti tubing is placed on the diode leads to prevent accidental short circuits. The tube-shield spring and flexible-copper grounding lead are soldered to the cable braid (the cable is RG-58/U coax in this probe). The tip can be either a phone tip or a short pointed piece of heavy wire.

shielded wire (microphone cable or small coax), alligator clip, tie point, resistor, phone plug, tube socket, tube shield, capacitor, and diode are purchased new; the total cost of the unit is approximately $2.25. Utilizing junk-box parts can decrease the total cost substantially.

The isolation capacitor, crystal diode, and resistor are mounted on a bakelite 5-lug terminal strip, as shown in the sketch. One end lug should be rotated 90 degrees so that it extends off the end of the strip. All other lugs should be cut off flush with the edge of the strip. Cut off about an inch of the outer insulation of the cable, unravel the braid three-quarters of an inch, slip a piece of spaghetti over the free end of the braid, and then solder its end to the ground lug on the terminal strip, as shown in Fig. 3. Remove the spring from the tube shield, slide it over the cable, and crimp it to the remaining quarter inch of shield braid. Solder both the spring and a 12-inch length of flexible copper braid to the cable shield.

Next, cut off the pins on a seven-pin miniature ceramic or mica shield-base tube socket. Be sure to use a socket with a cylindrical center post, such as the Johnson 120-277. Crimp the terminal lug previously bent out at the end of the strip and insert it into the center post of the tube socket from the top. Insert the end of a phone tip or a pointed piece of heavy wire into the bottom of the tube socket center post, and solder the lug and tip to the center post. Insert a half-inch grommet at the top of the tube shield, and slide the shield over the cable and flexible braid down onto the tube socket. The spring should make good contact with the tube shield to insure that the tube shield (probe case) is connected to the grounded side of the circuit. Finally, solder an alligator clip to the other end of the flexible braid and mount a phone plug on the free end of the shielded wire.

Be sure to mount components close to the terminal strip, as this keeps lead lengths as short as possible and minimizes stray capacitance. Use spaghetti over all wires to prevent accidental shorts. When soldering the crystal diode, hold the end to be soldered with a pair of long-nose pliers; this helps conduct damaging heat away from the diode.

Using the Probe

The a.c. input voltage that the probe can handle safely is limited to about 21 volts r.m.s. or 30 volts peak, as a result of the 60-volt peak-inverse rating of the 1N34A crystal diode. The phone plug on the probe cable plugs into the d.c. input jack of the v.t.v.m., and r.m.s. voltages are read on the vacuum-tube voltmeter's negative d.c. scale. When using the probe be sure that any d.c. voltage on the circuit being checked does not exceed the d.c. voltage rating of C1 (600 volts for small ceramic capacitors).

The accuracy of the probe is approximately ± 10 per cent from 50 kC. to 250 Mc. For example, if the error of the v.t.v.m. used with the probe is ± 5 per cent, then the overall error of the measuring system is ± 15 per cent. At low values of input voltage, below a volt or so, the accuracy of the probe is somewhat poorer because of the nonlinearity of the 1N34A crystal diode. At these lower input voltages the output of the probe more closely approaches a square-law relationship than a linear one.

The approximate input impedance of a probe of this type is 6000 ohms shunted by 1.75 μf. (at 200 Mc.),* and the amount of error introduced because of circuit loading by the probe is dependent on the impedance of the source of the a.e. voltage being measured. If peak values are desired rather than r.m.s., the r.m.s. values can be multiplied by 1.11 or the peak scales on the v.t.v.m. can be read directly if so calibrated.

W7WDZ's XYL fixed up an indoor 20-Mc. antenna for him by taping to one wall an 8-inch wide strip of aluminum foil cut to the proper length as a half-wave horizontal dipole. Now she's thinking of adding a reflector on the opposite wall. — W7SAB

* Ghirardi and Middleton, *How To Use Test Probes,* published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y.
High Performance at Reasonable Cost

This thirteen-tube receiver covers 3.5 to 50 Mc., includes a ham-built lattice crystal filter, "hang" a.v.c., high-stability oscillator, and a novel product detector.

BY PITT W. ARNOLD,* W9BYI
AND CRAIG R. ALLEN,** W9IHT

Some New Ideas in a Ham-Band Receiver

More and more hams appear to be discovering that they can build better receivers than they can buy, and for less money. But even if you have no intention of building a complete receiver, you may find a few points of interest in this receiver description. For example, if you have considered making a high-frequency lattice crystal filter for a receiver or sideband exciter, you will find some dope here on building and aligning it, and a circuit with an extra adjustment for extremely flat response in the passband. The h.f. oscillator is a good deal more stable than receiver oscillators usually are. Finally, the product detector has more than 300 times the gain of the double- or triple-triode circuits, and its linearity is at least as good.

Design of the receiver follows Goodman's philosophy of keeping gain low before the "knotchhole" to reduce overload problems. Plug-in coils cover the amateur bands from 80 through 6 meters. The homebrew crystal filter at 4.5 Mc. gives the maximum usable selectivity for s.s.b. The a.v.c. system is very flat and works on c.w., s.s.b. and a.m. A noise limiter and a sharp c.w. filter are included in the audio circuitry.

Front End

As shown in Fig. 1, the r.f. stage uses a 6AK5, which gave better sensitivity on 6 meters than any other pentode tried. It was even superior to a cascode circuit that was used for a while. The 6AK5 is contact-potential biased to permit grounding its cathode pins directly to chassis as an aid to stability.

The mixer is one section of a 6J6, cathode-biased, driven by the other section as a cathode follower. R.f. and mixer tuning capacitors are ganged and tuned by an "R.F. Peak" control on the panel.

This is an "idea" article rather than a blow-by-blow description of construction; nevertheless, there is ample detail for the reasonably-savvy ham who might want to copy it. Besides ideas, the accent is on design and adjustment of the less familiar circuits incorporated in the receiver.

H.F. Oscillator

The art of making oscillators stable has made great strides in the last decade. V.i.o.'s for transmitters are much better than they used to be, largely because the Clapp and Vackar circuits have become popular. Receivers, though, continue to use the ancient and mostly inferior plate-ticker, grid-ticker, and Hartley circuits, usually with a low $g_m$ tube such as 6C1. This seems strange, because oscillator stability is just as necessary in a receiver as in a transmitter.

This receiver uses the Vackar oscillator, which has several advantages over other configurations. Like the Clapp, it is a variation of the Colpitts which steps down the tuned-circuit impedance by a capacitive voltage divider, so that variations in load or in tube capacitances are swamped by the low impedances presented to the tube. A change in heater voltage or plate voltage thus has little effect on frequency. The Vackar, unlike the Clapp, permits the oscillator cathode to be grounded to avoid 60-cycle f.m. caused by heater-cathode capacitance. Its output is more

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*1041 N. Christiana, Chicago 51, Illinois.
**Box 319, Tolono, Illinois.
1"Goodman, "What's Wrong with Our Present Receivers?," QST, January, 1957.
Fig. 1—Schematic diagram of the receiver, reading from top left to right to lower right. Unless indicated otherwise, resistances are in ohms, fixed resistors are 1/2 watt; fixed capacitors marked with polarity are electrolytic, those having values over 0.01 μF are paper, others not listed below are disk ceramic.

C1, C9, C18, C13—3-30-μF micro compression trimmers.
C14, C15, C16—35-μF, double-bearing variable (Bud MC-1835).
Cr-C9, inc.—See coil table.
C17—15-μF, zero-temp. ceramic.
Li—L6, inc.—See coil table.
L6, L7, L8—15 to 25 μH; 45 turns No. 32 enam. close-wound at bottom of 3/8-inch slug-tuned form (CTC PLS-5), mounted in shield can (Bud SH-294).
L9—2-hy, high-Q audio toroidal inductor (UTC HQA-13); see text.
R1—10,000-ohm control, linear taper.
R2—15,000-ohm control, linear taper.
R3—0.5-megohm control, audio taper.
Rt—500-ohm control, screwdriver adjusted.

S1—Rotary, 1 section, 2 poles, 3 positions.
S2—S.p.s.t. toggle.
S3—Rotary, 1 section, 1 pole, 3 positions.
T1—Bifilar winding on ferrite toroid; see text.
T2—Interstage audio, 2.1 or 3.1, secondary to primary.
V1—Output, 10,000 ohms to voice coil (Thordarson 245S2).
Y1, Y2, inc.—4495-kc. Fl-243 surplus crystals, etched to frequency; see text. Y1 and Y2 have the same frequency; Y3 and Y4 are 1800 cycles higher.

Note: Numbers on r.f. and mixer coil terminals are standard pin numbers on the coil forms and sockets. R.f. coils are on 4-prong forms (Amphenol 24-4P) and mixer coils are on 6-prong forms (Amphenol 24-6P). Coils for 50-Mc. band are mounted inside coil forms.

Crystal Filter

The heart of the receiver is the crystal filter, which was inspired by Ben Yester's article. Its bandwidth is 2500 cycles between 6-db. points; final attenuation in the stop band is about 60 db. Insertion loss is negligible—less than a decibel.

The secret of really flat passband response lies in resonating the toroid (T1 Fig. 1) with trimmer C12. Without the trimmer there was a dip of several db. in the middle of the passband. With C12 properly adjusted the response is flat within a few tenths of a decibel.

Building and aligning a crystal filter is really not so tough. It's a good idea to buy ten or twelve of the surplus crystals. The next requirement is some means of measuring the pole-zero spacing of each crystal and checking it for

1 Yester, "Surplus-Crystal High-Frequency Filters," QST, January, 1950.
2 A "pole" of impedance is the parallel-resonant frequency of the crystal; a "zero" is the series-resonant frequency. The zero is lower in frequency, with the pole a kilocycle or two above it.
spurious resonances for 50 kc. or so above the main response. Vester outlines one method using a signal generator and the station receiver.

We didn't have a stable enough signal generator, so we haywired together a little three-tube test chassis using the circuit shown in Fig. 3A. The tunable 4.5-Mc. output of the test chassis is fed to the crystal as in Fig. 1 and the v.f.o. adjusted for a peak (at the zero) or a null (at the pole) on the v.t.v.m. Since relative frequency is all we need to know, the v.f.o. is heterodyned with a crystal oscillator and the resulting audio beat measured by Lissajous figures with a scope and a calibrated audio oscillator, set up as in Fig. 3B.

Four crystals with pole-zero spacings of 1600 cycles or more and a minimum of spurious peaks should be selected for the filter. Set aside two of the remaining crystals for use in the b.f.o. The filter crystals may then be etched with ammo-

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The filter may next be assembled in a Minibox of convenient size. In the filter assembly used in this receiver a Plexiglas plate, with holes cut in it for two octal sockets to hold the crystals, is mounted horizontally between the two long sides of the box. The number of turns on the toroid T1 should be chosen so that it resonates at 4.5 Me, with 20 to 25 μf, when the two sections of the bifilar winding are connected series aiding (see Fig. 5). A Q meter or grid-dip meter is a big help here.

Preliminary adjustment of the completed filter box is made using the setup of Fig. 6. Tuning the test chassis v.f.o. through the passband will show two peaks, at the upper and lower ends, respectively, of the passband. These peaks will not necessarily be of equal amplitude. Set the v.f.o. halfway between the peaks and adjust C12 for maximum reading on the v.t.v.m. or scope. Don't expect the passband response to be absolutely flat at this stage. It will look better later on when the filter has been mounted in the receiver and terminated in a properly adjusted L network.

I.F. Circuits

The 6C4 cathode follower after the mixer has about the right output impedance to drive the filter, which has a characteristic impedance of approximately 500 ohms. The L network (C15, L4 and the 68-μf. capacitor) can be adjusted to terminate the filter properly for flat response.

The b.f.o. is crystal-controlled to eliminate the drift problem and ensure that b.f.o. frequency is set correctly with respect to the filter passband. The entire b.f.o. crystals and all is built in a 3 1/4 × 2 1/8 × 1 1/4-inch Minibox, and all power...
Shielding encloses the r.f. stage and mixer, along the right-hand edge of the chassis in this view. The small shield can in the far right corner has been replaced by the 6C4 cathode follower, $V_1$, since the photo was taken. Crystal-filter box and i.f. components occupy the rear edge of the chassis, with detectors and audio stages along the left-hand edge. The 12AU7 projects horizontally from the b.f.o. shield box. The plug-in oscillator coil box is to the right of the main tuning capacitor.

Leads entering the box are filtered by 0.001-pf. feed-through capacitors. The output lead is made of miniature coaxial cable. These precautions proved to be necessary because a very little b.f.o. signal leaking into the i.f. circuits can block the product detector.

**Product Detector**

We believe that the product detector is a significant improvement over many of the circuits which have been published. It uses the 6G6N6 gated-beam tube, a type originally developed for service as limiter and phase detector in f.m. receivers. The signal grid of a good product detector must be very linear so that there is no intermodulation among components of the signal. A glance at the 6G6N6 curves shows that grid 1 is almost perfectly linear over a range of 2 volts peak-to-peak (0.7 volt r.m.s.), while outside this range the tube limits sharply. Grid 3 has similar characteristics except that its gain is lower.

Tests have shown that the linearity of the 6BN6 as a product detector is excellent. At 0.3 volt r.m.s. input to grid 1, the modulation recovered from a 50-percent modulated signal, measured with b.f.o. off, was 40 db, below the normal beat note obtained with the b.f.o. on. At an input of 0.7 volt the distortion products were still 35 db. down. Above 0.7 volt grid 1 was driven into the limiting region and distortion increased rapidly. Signal input in this receiver is 50 to 100 millivolts, well below the limiting threshold.

With 3 or 4 volts of b.f.o. injection on grid 3, the 6BN6 has a conversion gain of 50 — that is, 100 millivolts of i.f. signal at grid 1 produces 5 volts of audio at the plate. By contrast, a 12AU7

![Fig. 2 — Power-supply schematic.](image)

**Component Notes**

CR1 — Silicon rectifier, 130 volts r.m.s., 150 ma. (Sarkes-Tarzian M150).
L1, L2 — 10.5 hy., 110 ma. (Stancor C-1001).
51 — S.p.s.t. toggle.
T1 — Power, 340 volts c.t., 120 ma.; 5 volts, 3 amp.; 6.3 volts, 3.5 amp. (Stancor PC-8405).
T2 — Filament, 6.3 volts, 3 amp. (Thordarson 21F10).
T3 — Power, 117 volts, 20 ma. (Thordarson 26R32); heater winding not used.

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Fig. 3.—(A) Circuit of test chassis. (B) Setup for measuring relative frequency of v.f.o. Resistances are in ohms; resistors are 1/2 watt. Fixed capacitors are ceramic.

C1—30-150-μf.f. variable with worm drive, taken from ARC-5 transmitter.
C2—140-μf.f. air trimmer (Hammarlund APC-140).
C3—25-μf.f. air trimmer (Hammarlund APC-25).

in the double-triode detector circuit showed a conversion gain of 0.15 with similar input levels. Noise peaks, incidentally, are clipped by the 6BN6, leaving less work for the regular noise limiter.

The 6BN6 has one drawback—it is slightly microphonic. Trouble from this source can be avoided by mounting the tube socket on a small metal plate and bolting the plate to the chassis through rubber grommets.

Detection of a.m. signals is accomplished by an ordinary diode using one section of a 6AN8. The pentode half of the 6AN8 supplies enough gain following the diode so that one can switch from s.s.b. to a.m. without readjusting the audio gain control.

The 6AL5 noise limiter is a double-ended shunt type. It is located ahead of the a.v.c. circuits to keep noise pulses from operating the a.v.c. It also precedes the c.w. filter so that the filter will not ring on noise peaks. A shunt limiter does not clip quite as sharply as the series-diode type, but neither does it distort signals below its limiting threshold; a series limiter produces a noticeable amount of distortion on all signals.

A simple audio filter is a good way to get c.w. selectivity in a receiver of this kind, since the crystal filter knocks out the audio image, or 'other side of zero beat.' The tuned circuit made up of \( L_a \) and the 0.02-μf. capacitor resonates at 850 cycles. The coil specified for \( L_a \) has a \( Q \) of almost 100 and tunes as sharply as anyone could want. In fact, it rings a little on signals; many operators might prefer a bit less \( Q \). There are toroids available from Arrow Sales \(^7\) with a \( Q \) of about 24, at prices considerably lower than the eleven-dollar tag on the UTC HQA-13.

A.V.C.

The "hang" a.v.c. system was taken from W0BFL's article \(^8\) with minor modifications. The 270K resistor in series with the a.v.c. line slows down attack time enough to prevent noise peaks.


\(^8\) Luck, "Improved A.V.C. for Side Band and C.W.,” QST, October, 1957.
cycles to restore balance on voice signals. The resulting audio quality is crisp and intelligible.

Construction

The receiver is built on a 12 × 17 × 3-inch aluminum chassis with an 8¾-inch aluminum rack panel. The top-view photo shows the layout. The oscillator tuning capacitor, C10, is driven by a National NP5-0 dial and gear unit, through an insulated coupling. The capacitor is mounted on a ½-inch sheet of mica-filled bakelite, and its mounting feet are bolted to an aluminum L-bracket which is fastened to the bakelite sheet. This arrangement provides two-point support to prevent the stator from twisting. The bakelite sheet is held away from the gear box by three metal spacers and 12-24 threaded rods. The only electrical ground on the rotor of C10 is a heavy wire lead passing through a hole in the chassis and connected to a solder lug on the underside. Thus the circulating current through C10 has a single definite path so it can't wander all over the chassis looking for a route to the under surface.

The oscillator coil and associated capacitors for each band are assembled in a 4 × 2½ × 2½-inch Minibox (see close-up photo). A piece of mica-filled bakelite in the bottom of the box supports a row of four banana plugs which project through a rectangular cutout in the 4 × 2½-inch surface of the box section. A fifth banana plug grounds the shield box to the chassis.

A small copper shield is soldered across the 6BN6 socket to isolate the signal grid (pin 2) from the f.o. injection grid (pin 6). All power wiring is done with shielded wire to eliminate one source of feedback.

The power supply is built on a separate 5 × 10 × 3-inch chassis. Its schematic is shown in Fig. 2.

Alignment

Alignment of the front end is easy, since the receiver is not gang-tuned. The i.f. stages and the L network terminating the crystal filter can be aligned with the aid of the test chassis of Fig. 3. Pull out the 6AK5 and wrap a wire from the test chassis r.f. output around the mixer coil. Set the sideband switch to the a.m. position, a.v.c. off, and connect a d.c. v.t.v.m. or high-resistance voltmeter across the 270K load resistor in the cathode of V8A. Pull out the 6BN6 to avoid load-

Fig. 4—Isolating network used for measuring crystal pole-zero spacing and spurious resonances. The crystal is plugged into an octal socket and the remaining socket contacts are used as tie points for the ½-watt resistors. Indicator can be a v.t.v.m. with r.f. probe or a wide-band scope.

from operating the a.v.c. A very slight "burst" can be noticed now on the first syllable of a transmission, but it is not bothersome at all. A choice of two recovery time constants is provided. The "fast" position is occasionally useful on rapidly fading signals, but the "slow" position is used most of the time. Delay bias on the attack and recovery diodes (determined by the 470K-100K divider) is set so that the i.f. signal at the detectors is about 50 to 100 millivolts, as already noted.

The principal change from Luick's a.v.c. circuit is the method of applying manual r.f. gain control. The r.f. gain knob controls a variable negative bias which is fed to the a.v.c. line in such a way that it controls receiver gain and at the same time acts as additional delay bias on the a.v.c. diodes. Thus the r.f. gain knob can be set to prevent background signals and noise from booming in during pauses, while full a.v.c. remains available to handle normal fading.

Shunt capacitors in the audio circuits are chosen so that high-frequency response drops off above 2500 cycles to reduce fatigue from high-pitched hiss. Low frequencies are cut below 300
ing by its grid current. Tune the test chassis v.f.o. within the filter passband, set $C_{13}$ near maximum capacitance, and peak $L_a$, $L_7$ and $L_9$. Now tune the v.f.o. carefully through the passband and observe the flatness of the filter response. Adjust $C_{13}$ to a slightly different value and repeak $L_a$. Repeat this process until the passband response is as flat as possible. Set the v.f.o. to the exact center of the passband and check $C_{12}$ for maximum signal. The filter response should be flat within about 5 per cent. Reinsert the GBN6 and repeak $L_8$ with the r.f. gain control set to give the smallest observable deflection on the voltmeter.

When the filter alignment is complete, the b.f.o. crystals may be etched to frequency. Set the test chassis v.f.o. about 10 db. down one skirt of the filter response curve (voltage one-third of maximum). Etch the b.f.o. crystal until it is in zero-beat with the v.f.o. Do the same thing with the other b.f.o. crystal on the other filter skirt.

To check for spurious filter responses, restore the receiver to normal operation and tune in a strong modulated signal on a dead band, such as 10 meters in the evening. Tune the main dial through about 50 kc, tuning above the signal on 80 or 40 or below the signal on 20, 15, 10 or 6. Listen carefully to see if the signal appears at another dial setting. If so, the spurious response can sometimes be reduced by interchanging $Y_1$ and $Y_4$. It is then necessary to readjust $C_{12}$.

The product detector is adjusted for best linearity by tuning in a modulated signal and setting the r.f. gain to give about 15 volts of audio at the 6BN6 plate with b.f.o. on. A modulated signal generator is best, but a voice signal will do. Disable the b.f.o. by pulling out the 12AT7 and adjust the 500-ohm resistor, $R_4$, in the 6BN6 cathode for minimum recovered audio. There should be a sharp null near mid-range on the resistor. If the null is broad try changing the r.f. gain till you find a definite setting of the 500-ohm resistor where the signal almost disappears. A setting near maximum or near zero resistance is not correct; the tube is in the limiting region here.

**Toroids**

The only unusual item in the parts list is the ferrite toroid $T_1$. A readily-available source of toroids, suggested by Brian Voith, W9AIZ, is the hollow ferrite core of a b.c. set antenna made by Grayburne and sold under the name Superex Ferri-Loopstick, net price 44 cents. A machinist who owns a small diamond cutting wheel can slice off a few toroids for you. It is also possible, with a little luck, to break the ferrite like a piece of glass tubing after filing a notch in it. The break may require smoothing with a file or grinder. No. 24 or 36 enamel wire is about right for the winding. The Ferri-Loopstick toroid takes about 9 bifilar turns to resonate with the 3-30-muf. trimmer.

Apparently almost any kind of ferrite will do for the toroid. The transformer is connected at a low-impedance point, so losses have little effect. Some rather high-loss material has been used experimentally with good results.

**Results and Second Thoughts**

The completed receiver has proved very satisfying to operate on the crowded bands. A.v.e. is remarkably flat and works equally well on sideband, a.m. or c.w. Noise figure has not been measured, but it appears to be as low as necessary even on 6 meters.

The crystal filter performs well as it is, but a possible project for the future is to add two more half-lattice sections to make it an 8-crystal filter. Skirts would be steeper, final attenuation increased, and spurious responses knocked down further.

Another idea that may be tried sometime is to replace the tuned mixer grid coils with plug-in bandpass couplers. The r.f. peaking control could then tune the input circuit to exact resonance in spite of any detuning by antenna resistance.

It is possible that a strong signal on the 45-Mc. i.f. might get through the front end on 80 meters. A parallel-tuned trap in series with
the antenna lead should take care of it. The bottom plate of perforated aluminum helps to prevent direct pickup of signals in the i.f. wiring.

The design of this receiver was a joint project between the authors, but W9BIY did all the construction, and the set belongs to him. Any questions about details of construction or performance should be addressed to W9BIY.

We wish to thank Jim Fisk, W9GRQ, for taking the photographs and for his many helpful comments on the article.

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**New Apparatus**

**Mobilier Safety-Mike**

Mobile operating with both hands on the wheel is possible when the Mobilier Safety-Mike shown in the photograph is used. Designed to enhance mobile operating safety, the device is made from stainless-steel wire which has been coated with a tough layer of gray plastic material. The headgear can be sprung and formed by hand to fit the wearer’s head. The model shown in the photograph also contains a “flexi-mount” attachment which allows the wire cage microphone support to be moved and locked vertically or laterally to fit the wearer. Models fitted with crystal, carbon or controlled-reluctance cartridges are available, and an earphone attachment can be obtained if desired. Using the Safety-Mike in conjunction with voice-operated break-in, or with a foot switch which is also available from the manufacturer, will still further insure safe and pleasant mobile operation. The Safety-Mike weighs only a few ounces. It is manufactured by the Mobiliers, 722 Main, Coshocton, Ohio.

— E. L. C.

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**Strays**

Last September W4FKJ was tuning toward the 160-meter band from WWV on 2.5 Mc, when, on about 2.2 Mc, he heard someone frantically calling the Coast Guard and saying that he was sinking. The Coast Guard station in New Orleans answered but reported that the signal from the sinking vessel was too weak to copy the message. W4FKJ got right on the telephone and called the Coast Guard station in New Orleans, reporting the name of the sinking vessel and its announced location. The net result was that all personnel aboard the vessel were saved, and W4FKJ received a nice letter of thanks from the Coast Guard.

K4RBO, a teacher at the Gibsonville (N. C.) high school, brought his ham rig to school to demonstrate to his pupils. Unfortunately, when he fired up with a lusty CQ on 10 meters, he got into a tape recorder that was being used with puppets for a production of “Macbeth” in the auditorium, and broke up the performance.

JA1BIG is six foot three — KN3IJP/KA2 adds: “As you know, 6’ 3” is tall for a man in the U.S. but for a Japanese that is a monster. JA1BIG says that people are always coming up and standing by him — they just look up at him and stare. His XYL is 4’ 1’’!”

May 1960

33
Simple Converter Unit with 24-Mc. Output

Using the 80-Meter V.F.O. on 2

BY ELWYN A. GUEST,* W2BLO

There are undoubtedly numerous hams operating on 144 Mc. using the conventional exciter lineup consisting of an 8-Mc. crystal, 12AT7 third-overtone crystal oscillator-multiplier, and 5763 doubler, or the like. Many of these same hams have reasonably stable basic v.f.o.’s on 3.5 Mc. which they use on the so-called “d.c.” bands. The presence of this latter unit, with the advantages of v.f.o. operation, which are apparent even on 144 Mc., and the simplicity and low cost of putting it to use with the little unit described herewith, make it unnecessary to be without such a useful adjunct.

At this writing, the author has just finished a year and a half of 144-Mc. operation with the aforementioned conventional crystal-controlled lineup. He has considered himself fortunate to be able to jump about the band rather freely with a bank of six crystals and a switching arrangement with an equal number of settings, to say nothing of a few spare rocks which could be substituted in one of the receptacles if desired. There were times, however, when contacts were missed, or during contests and band openings, when the 80-meter exciter with its v.f.o. got more than a casual glance. Although the v.f.o. stability was such that we might have considered a simple multiplier to put it to use, its tuning range barely covered the 3.5-4-Mc. band, and therefore its harmonics would not hit the 144-Mc. band. Thus, its real possibilities did not occur to us for many months.

The Solution

Then, a few weeks ago, our friend Fred Winters, W2PZF, was visiting in our shack when the conversation hit upon the subject of the v.f.o. and how nice it would be to use it on 144. At his suggestion, we got out paper and pencils and a crystal catalog (Texas Crystals) and began to make calculations based on a heterodyne system. We finally hit upon two low-cost surplus crystals which would give us what we needed to cover the 144-Mc. band. When operated in a third-overtone oscillator circuit, stock crystals of 6825 kc. and 6900 kc. oscillate on 20.175 Mc. and 20.7 Mc., respectively. When mixed with the 3.5-4-Mc. signal from the v.f.o. unit, these signals add up to the 24-Mc. frequencies desired.

Using the capacitive feedback type of overtone oscillator in our 144-Mc. rig, and crystal switching, as we do, we were able to devise a simple method of switching the mixer output into one of the crystal sockets and at the same time provide for neutralization of the former crystal oscillator. The latter is a necessity because the oscillator operates as a straight-through amplifier on 24 Mc. (see Fig. 1). With the crystal switch in the other position (or, actually, in one of five other positions in our case), the stage is still used as a crystal oscillator when desired.

The Converter

The mixer-oscillator is of conventional design, utilizing a 12AT7. The oscillator is a capacitive-feedback overtone type and requires a single-pole double-throw rotary switch for switching the two crystals. A TV width control proved to be a convenient unit for the 3.5-Mc. slug-tuned circuit. We removed turns down to one close-wound layer and shunted it with a 50-μf, ceramic fixed
A bottom view of the mixer-oscillator unit. The modified TV width control, used for the 80-meter tuned circuit, is in the center, foreground, while the slug-tuned oscillator coil can be seen just behind it. The link from the v.f.o. unit is connected to the binding posts at the left. At the top is the 24-Mc. tuned circuit and link, while the crystal switch is at the bottom. A toggle switch is in series with the B-plus lead so that the unit may be switched off separately if it is desired to operate the rig crystal-controlled.

capacitor. The coupling to be used between this coil and the v.f.o. link depends upon the output power of the v.f.o. We had to couple ours very loosely because our v.f.o. exciter unit has a 6L6 doubler for the output stage, which can easily overdrive the mixer grid.

The entire unit was constructed on a \(4 \frac{1}{2} \times 3 \frac{3}{4} \times 2\)-inch aluminum chassis. Power to operate it is taken from the main rig through a three-wire cable. A toggle switch in the B-plus lead provides for switching the mixer-oscillator off when the rig is crystal-controlled.

**Other Systems**

Admittedly, the heterodyne method could be utilized to give a mixer output frequency of 8 or 12 Mc. and would require only one crystal to cover the entire band. This would have the additional advantage that its output could be fed as a crystal substitute into the oscillator, which would then act as a tripler or doubler and would require no neutralization. However, we preferred the 21-Mc. arrangement, not only on the theory that there would be less likelihood of TVI, but also because it results in a drift ratio between the v.f.o. and the 144-Mc. band of 1 to 6, as compared to 1 to 18 or 1 to 12 with the other systems.\(^1\)

Of course, the 6S25-ke. crystal alone would be sufficient for anyone who has no reason to operate above 146.85 Mc. However, we not only

\(^1\) All heterodyne systems produce spurious beats, some of which may reach the transmitter output at substantial levels. The output of any transmitter using such a system should be checked carefully as mentioned later in the article.

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**Fig. 1**—Conversion circuit for obtaining 24-Mc. output with 3.5-Mc. input. Capacitances are in \(\mu\)F. Bypass capacitors are disk ceramic; other fixed capacitors should be NPO ceramic or mica. Resistors are \(\frac{1}{2}\) watt and resistances are in ohms.

- \(C_1\) — 25-\(\mu\)F. miniature variable (Bud LC1 — 642 or equivalent).
- \(C_2\) — 30-\(\mu\)F. mica trimmer.
- \(L_1\) — 50 turns No. 26 enam., on \(\frac{3}{8}\)-inch iron-slug form (Stancor WC-7 TV width control with turns removed leaving single layer, full length, approx. 40 \(\mu\)H).
- \(L_2\) — Single turn of hookup wire loosely coupled to ground end of \(L_1\).
- \(L_3\) — 12 turns No. 32, \(\frac{3}{16}\)-inch long on \(\frac{3}{8}\)-inch iron-slug form, approx. 5 \(\mu\)H.
- \(L_4\) — 15 turns No. 20, \(\frac{3}{8}\)-inch diam. \(\frac{3}{4}\)-inch long (B & W 3007 Miniductor, approx. 1.8 \(\mu\)H).
- \(L_5\) — 2- or 3-turn link at ground end of \(L_4\) (same coil stock as for \(L_5\) may be used).
- \(S_1, S_2\) — Sp.d.t. rotary.
- \(Y_1, Y_2, Y_3\) — See text.
operate in a RACES net on 147.21 Mc., but also like to use the upper portion of the band for local ragchews. The 6990-kc. crystal gives a big overlap and covers the rest of the band very nicely.

Calibration

Since the third overtone of a crystal will not necessarily be an exact multiple of the fundamental frequency, it is important to check the oscillator frequency in the 20-Mc. range, or the mixer output frequency in the 21-Mc. range, before setting up a 141-Mc. calibration chart based on the v.f.o. calibration. If a frequency meter for these frequencies is not available, checks may be made against known frequencies in the 141-Mc. band, making sure that you are listening to the right signal, since harmonics of various frequencies resulting from the mixing process are likely to be heard, almost as loud as the fundamental, in the receiver.

Once the oscillator frequency is known and the calibration definitely established, a 141-Mc. calibration chart may be drawn up, and it is suggested that this include receiver settings. At W2BLO we show the frequency and the v.f.o. dial setting for each dial division on the receiver. This is handy and almost necessary if one wishes to be able to "zero in" quickly to a particular spot on the receiver dial, since the harmonics mentioned in the paragraph above can cause some confusion if one tries to do it entirely by ear.

Spurious Output

One disadvantage of the heterodyne method of frequency conversion is that spurious frequencies are generated which may get through to the final amplifier or antenna. Recognizing this fact, several checks were made both with a g.d.o. and with the assistance of local amateurs with sensitive receiving systems. All checks showed that spurious signals were negligible so long as the coupling between the v.f.o. and the 80-meter coil in the mixer was adjusted to the minimum required for adequate drive.

Strays

Here are the May schedules for the various MARS technical nets.

First Army MARS
(Wednesday evenings, 2100 EST, 4030 kc. upper sideband)
May 4 — Antenna Panel.
May 11 — Frequency Control.
May 18 — Communication Electronic Needs of the Future.

AF-MARS Eastern
(Sunday 1400 EST: 3285, 7540 and 15,715 kc.)
May 1 — Quality Control Techniques.
May 8 — Medical Electronics in Gastro-intestinal Research.
May 15 — The Evolution of Modern Radar.
May 22 — Air Crew Escape Systems.
May 29 — Modern Materials.

AF-MARS Western
(Sunday 1400 EST, 7832.5 kc., 3295 kc. and 143.46 Mc.)
May 1 — Increasing the Versatility of the Simple Oscilloscope.
May 8 — Steps in Space.
May 15 — Operation Alert 1960, of O.C.D.M.
May 22 — The Challenge of Inertial Guidance.
May 29 — Technical Net Session.

How many of you have plowed through the Course in Radio Fundamentals published by the League, designed to be studied in conjunction with the Handbook & K6TER did, and here he is pictured with the manuals and the experimental gear that he built during his study. Incidentally, we have just published new editions of both the Course and the Handbook. Anyone who works his way through the Course will have a good basic knowledge of radio.
The panel is 10½ inches high and of standard 19-inch rack width. The pi-network coil switch is between the tank-capacitor and loading-capacitor controls. Across the lower portion of the panel, from left to right, are screen meter, a.c. power switch, grid meter, S5 (above) and S6, and the cathode-current meter.

“Der Loudenboomer”

High-Power Grounded-Grid AB, Linear for Multiband S.S.B.

BY LEE BERGEN,* W9AIW
AND W. T. BISHOP,* W9UI

What price high power? Well, actually not too much when it is made a community project.

A few months ago, W9RE suggested that the spare-time manufacturing facilities of Radio Industries, Inc., and the procurement facilities of several of the local hams be united for the purpose of constructing a group of s.s.b. linear amplifiers at nominal cost to each of the participants. A quick meeting of W9UI, W9AIW, W9HERG, W9LVA, W9AMB, W9RE and W9UQY was called and thus “Der Loudenboomer” project was born.

* Radio Industries, Inc., 1307 Central Ave., Kansas City 2, Kansas.

A standard 17 X 13 X 4-inch chassis provides adequate space for the amplifier. The antenna relay is to the rear of the pi-network loading capacitor at the left. Behind the dual tank capacitor at the right are filter capacitors, voltage-regulator tubes and the thermal time-delay switch. The screen-supply filter choke is in the rear left-hand corner. The strap (S1) which connects the two stators of the tank capacitor for operation on the lower frequencies may be seen at the right of the capacitor.

Several evenings were spent kicking ideas around. The good ones were sifted out and these, together with some unique features from current commercial s.s.b. transmitters, finally froze the design. The schematic gradually took form, and the fabrication of seven sets of parts was underway. Evening operation of punch presses, lathes and welding equipment by the seven pencil jockeys was successfully concluded with loss of neither hand nor limb.

The story of these amplifiers is written not so much with the idea that they will be closely duplicated, but more with the hope that they will furnish some suggestions that may be combined with the individual imagination in the design.

May 1960
Fig. 1—Circuit of the 4CX1000A grounded-grid amplifier. Capacitances less than .01 μf. are in μuf.

C<sub>1</sub>, C<sub>6</sub>, C<sub>7</sub>—Ceramic (CRL 858-S-1000).
C<sub>2</sub>, C<sub>3</sub>—Three 5000-μuf. 600-volt disk ceramics in parallel.
C<sub>5</sub>, C<sub>6</sub>—500-volt mica.
C<sub>4</sub>, C<sub>6</sub>—Ceramic TV capacitor.
C<sub>0</sub>—Special dual capacitor; see text.
C<sub>11</sub>—Three 500-μuf. 10,000-volt "Glassmike" capacitors in parallel (Condenser Products LSG501-1OM).
C<sub>12</sub>—2000-volt variable (Johnson 1000E20).
I<sub>1</sub>—6-volt dial lamp.
I<sub>1</sub>—Chassis-mounting coaxial receptacle (UG-290/U).
L<sub>1</sub>—13 turns 3/4-inch copper tubing 5 inches long, 3 inches in diameter, tapped at approximately 6 turns, 4 turns, 3 turns and 2 turns. (Adjust to resonate with C<sub>10</sub> set at 330, 150, 70, 40 and 25 μuf. respectively for the bands 3.5 through 28 Mc.)
M<sub>1</sub>—2½-inch d.c. milliammeter (Marlon).
RFC<sub>1</sub>—Bifilar filament choke (B & W FC-15).
RFC<sub>2</sub>—125-ma. r.f. choke (Miller 4642).
RFC<sub>3</sub>—Plate r.f. choke (National R-175-A).
RFC<sub>4</sub>—1-ampere r.f. choke (Miller 7868).
RFC<sub>5</sub>—125-ma. r.f. choke.
S<sub>1</sub>—Strap connector on C<sub>10</sub> (see top-view photograph).
S<sub>2</sub>—Heavy-duty 25-amp. ceramic single-pole 5-position rotary (surplus).

of any high-power AB<sub>1</sub> linear. To each his own, since no two hams have the same requirements or desires.

**R.F. Circuit**

Basically, the amplifier was designed around the Elmac 4CX1000A tube, and was to be driven by any of the 100-watt s.s.b. exciters currently available. To make the efficient use of these exciters, a grounded-grid circuit configuration was indicated.

The complete circuit diagram is shown in four sections for the sake of clarity. Fig. 1 shows the r.f. circuit. It is a quite conventional arrangement for grounded-grid operation and has a pi-network output circuit covering all bands from 3.5 to 28 Mc, with a tapped coil. The tank capacitor is a special dual unit made by Johnson. One section has a maximum capacitance of 50 μuf. while the maximum of the other section is 300 μuf. The 50-μuf. section alone is used for 14, 21 and 28 Mc. A strap connects the 300-μuf. unit in parallel for the two lower-frequency bands. This arrangement reduces the tank-capacitance minimum on the higher-frequency bands where stray capacitances make it difficult to hold the tank Q down to a reasonable value. A single-section vacuum variable could be used instead of the dual unit, since capacitors of this type have low minimums. On 80 meters, the output capacitance is brought up to the required value by switching in a 1500-μuf. fixed capacitor in parallel with the variable loading capacitor C<sub>12</sub>.

The bifilar choke RFC<sub>1</sub> provides the necessary r.f. isolation between filament and ground. The milliammeter M<sub>1</sub> reads cathode current. The screen is protected by a ½-ampere fuse.

**Bias Supply**

Fig. 2 shows the bias supply. For the sake of compactness, semiconductors are used as rectifiers in a full-wave bridge configuration. An OB2 provides a constant-voltage source across which a voltage divider permits adjustment of bias to give the desired idling plate current. The transformer is a special job which includes a filament winding for the 4CX1000A. If space permits, individual transformers may be substituted, of course.

The 4CX1000A has a grid dissipation rating of zero watts, so any flow of grid current must be guarded against. This function is performed by K<sub>1</sub> which will trip at a grid current of 3 ma. Op-
Fig. 2—Bias supply for the grounded-grid amplifier. K1 is a safety device which trips if grid current flows. The milliammeter may be switched by S3 to read amplifier r.f. output voltage.

C13—Two 200-μF, electrolytic units in parallel.

CR1, CR2, CR3, CR4—Silicon diode (1N540 Texas Instruments).

K1—5000-ohm 5-mw, sensitive relay (Sigma type 5F-400).

M3—2½-inch d.c. milliammeter (Marion).

R1—Bias-control potentiometer.

S2—Three-pole double-throw-rotary, lever or push-button type with spring return to normal position shown (CRL 1457).

T1—Power transformer: 150 volts, 80 ma; 6 volts 12.5 amp. (Special). Individual transformers may be substituted.

Trigger of this relay serves to trip relay K2 in Fig. 4 which, in turn, cuts off plate and screen voltages and shorts r.f. drive to the amplifier. The meter M2 serves only as an indicator for adjustment of drive just below the grid-current point. S3 has a spring return which holds the switch in the normal position shown. The momentary-contact position shifts the meter to read rectified r.f. voltage at the output of the amplifier while it is being adjusted for maximum output.

Screen Supply

A regulated screen supply is shown in Fig. 3. Here again semiconductors are used to conserve space. The four series-parallel connected OA2 regulators will handle a variation of 50 ma, or more. However, analysis of the screen-current pulse indicates that the ratio of maximum instantaneous current to the d.c. value is approximately 5 to 1, which means a peak screen current of about 250 ma. Regulation at these peaks is provided by the storage capability of the 40-μF output capacitor in the supply filter. The combination of resistor network between the pairs of VR tubes and the tap back to supply voltage is a measure that will assure reliable parallel operation.

To keep the screen-current meter at ground potential, it is connected in series with the regulator tubes, rather than in the positive d.c. lead to the screen. In this position it indicates VR-tube current rather than actual screen current. With the amplifier in the stand-by condition, the meter reads about 80 ma. When the amplifier is driven, screen current is indicated by excursions of the meter pointer toward zero. If the reading falls to zero, it indicates that regulation is lost and that the screen current is above normal.

The primary of T2 is connected in parallel with the primary of the plate transformer so as to be controlled simultaneously with it.

Control and Protective Circuits

Fig. 4 shows the control and protective-circuit wiring. All power is controlled primarily by S7,

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Fig. 3—Regulated screen supply for the "Loudenboomer."

CR5, CR6—Each has four 1N540 (Texas Instruments) silicon diodes in series.

L2—Filter choke (Stancor C1001).

M3—2½-inch d.c. milliammeter (Marion).

T2—830 volts, c.t., 200 ma. (Stancor PC-8301).

Electrolytic capacitors are each two 20-μF units in parallel.

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which also controls operation of the tube-cooling blower $B_1$. However, filament and bias voltages will not be applied until $S_4$ closes. This switch is operated by a paddle inserted in the air stream of the blower to assure that filament and bias voltages will not be applied without the blower in operation. One of the quickest ways to damage the 4CX1000A is to apply plate and screen voltages before the cathode has reached normal operating temperature. For this reason, the control circuit is so arranged that plate and screen voltages cannot be applied until after the 3-minute time-delay switch $S_1$ has closed.

From this point on, control is through the VOX relay contacts which actuate the change-over relay $K_5$. In the normal position of $K_5$, the antenna is connected to the receiver and the auxiliary contacts are open. The grid bias under this condition is approximately 100 volts, which reduces the screen and plate currents to low values on stand-by. When $K_5$ is actuated by the VOX relay, point X in Fig. 2 is grounded through the auxiliary contacts of $K_5$, which brings the biasing voltage to the normal operating value of $-60$ when $R_1$ (Fig. 2) is properly adjusted.

$K_5$ is a locking relay with mechanical latching and electrical reset. On $K_5$, one normally-closed contact and one normally-open contact of the d.p.d.t. complement are used. On $K_5$, only one normally-closed contact is used. The relay is latched mechanically in the normal operating position shown in Fig. 4, neither coil being energized. The primary circuits of the plate and screen transformers are held closed through the normally-closed contact of $S_{2A}$. When a grid over-load occurs (approximately 3 ma.), $K_1$ (Fig. 2) closes, thereby energizing $K_{2A}$. $K_2$ is now latched in the opposite position. This action performs three functions: excitation is shorted, plate and screen voltages are removed and $K_{2A}$ is deenergized (but held mechanically). $K_2$ can be reset to normal position by closing the pushbutton switch $S_5$. The relay should be mounted in such a position that the excitation-shorting leads may be made short.

The r.f. output voltmeter rectifier $CR_7$ operates from a tap on a capacitive divider across the output of the pi network.

Essential constructional details are covered by the photographs and their captions. Some advance thought should be devoted to the distribution of components on the under side of the chassis so as to leave adequate space for the blower. $C_2$ and $C_4$ each consist of three units in parallel, one unit in each case being connected to one of the three “ears” on the fin terminals. The open-type antenna relay is mounted directly at the output terminals of the pi network so as not to introduce any change in s.w.r. on any part of the line. The r.f. voltmeter diode and associated components are mounted in a shielding box alongside the relay.

**Adjustment**

Fifty watts will drive the tube to the point of grid-current flow. The average cathode driving impedance is in the order of 40 ohms. But this does not mean that a 50-ohm coaxial cable will automatically be properly terminated by the amplifier. The impedance varies widely with excitation and loading. For this reason, keep the cable connection to the driver as short as possible.

A grounded-grid Class AB1 linear must be adjusted somewhat differently than the usual Class C amplifier and with the 4CX1000A special care must be exercised to prevent exceeding the control-grid and screen-grid dissipation ratings. The reader is referred to the single-sideband chapter of the ARRL Handbook, 1950 edition, for information on checking the operation of linear amplifiers. The bias should be adjusted for an idling current of 200 to 250 ma. The drive should be maintained at a level just below the grid-current point. Under some operating conditions, a small reverse grid current may be indicated. This is a result of secondary emission but it is of no consequence since it does not impair the operation of the tube.

The simplest way to arrive at proper loading is to set up on single-tone (o.w.) and resonate the plate tank by tuning for a peak in screen current, and then loading for a screen-meter reading of approximately 30 ma. Approximate output-capacitor values for a 50-ohm load are 2000, 1000, 500, 330 and 250 µf. for the respective bands 80 through 10 meters.
Fig. 4 — Control and protective circuits of the 4CX1000A amplifier. Capacitors of 0.01 μf. are disk ceramic; others are stable ceramic or mica. Capacitors are in μf. unless indicated otherwise. Resistances are in ohms.

B1 — Blower (W. W. Grainger 2CD67).  
CR7 — IN34 crystal diode.  
J3, J5 — Chassis-mounting coaxial receptacle (SO-239).  
K5 — Electrical-reset locking relay, 115-v. a.c. coils, d.p.d.t., contacts each section (Guardian 1R-1200-1200-115GG). See text for explanation.  
K3 — Antenna change-over relay (Leach 1177CBF).

"Der Loudenboomer" has turned out to be a real flame thrower. It has operated smoothly without the need for any form of parasitic suppression. At least part of the credit for this should go to the excellence of tube design, although the short, heavy leads in the r.f. plate-to-cathode path also contribute to the stability at v.h.f. Based on the ratio of r.f. power output to d.c. power input to the final amplifier, the efficiency is better than 70 per cent. The total r.f. output includes, of course, a good share of the driver output.

**O**ne of the grimmest tales of accidents in the ham shack comes from an Oregon amateur who writes:

"Recently you have mentioned some of the near fatal accidents that have been the result of carelessness in radio work. Most have been caused by high voltage — but I wish to report a somewhat different near fatality.

"Near the inner door to our garage, I had stored a multisection mobile whip. Since it was eight feet high when assembled, I had to remove some of the sections in order to set it upright. The bottom four sections had been left leaning against the wall for about three months and not much thought given to it.

"But one night my father opened the inner door, reached for a broom in the corner, hit the antenna and — when he reached down for the dustpan — ran the antenna five inches up his nose and into his sinus cavity.

"He bled quite badly and had to remain in the hospital for a day and a half. But the doctor said he was very fortunate. If the antenna had gone to the right or left, it would have gone into his eye cavity.

"If it had gone just a fraction of an inch farther forward, it would have killed him.

"This accident is one in a million, but it shows the potential accidents that can lie around our shack. All of us could benefit by asking ourselves: 'How dangerous is that open knife on the bench?'"
Hallicrafters SX-111 Amateur-Band Receiver

The Hallicrafters Model SX-111 is a double-conversion selectable-sideband receiver designed for reception of a.m., c.w., and s.s.b. signals. Using 13 tubes, including a rectifier and voltage regulator, it tunes all amateur bands between 80 and 10 meters, plus 10 Mc. for WWV reception. There is generous overlap on several bands so that some of the MARS frequencies can be covered. The i.f. system incorporates stepped selectivity offering five different band widths: 5, 3, 2, 1 and 0.5 kc.

Although most of the electrical features of the receiver, such as the notch filter, sideband selection, and variable-bandwidth i.f. selectivity, have been used in earlier higher-priced Hallicrafters models, the SX-111 has a completely new look from the mechanical standpoint. Housed in a one-piece gray cabinet (not shown in the photographs), it measures 18 1/2 inches wide, 8 7/8 inches high and 10 1/2 inches deep. The illuminated side-rule dial escutcheon occupies nearly half of the front-panel area. Dial graduations, spread over a 1 1/2-inch width, are marked at 10-ke, intervals on the 80-, 20- and 15-meter bands, and at 5-ke, intervals on 40 meters. On 10 meters the markers are every 25 ke. The various bands are spread over the same length of dial scale, giving an average tuning rate of 25 ke. per knob rotation on 3.5 Mc., 15 ke. per turn on 7 Mc., 20 ke. on 14 Mc., 25 ke. on 21 Mc., and 85 ke. on 28 Mc. (20 complete revolutions of the tuning knob to cover the scale). The main tuning control is flywheeled to give a good tuning "feel."

An interesting feature of the cabinet is that there are no ventilation holes in the top, bottom or sides; instead, the cabinet is completely open at the back. Apparently this is sufficient for cooling purposes. This feature should find hearty acceptance among those who like to place various accessories on the cabinet top or those who are plagued by dust gathering in the receiver's "inards." The simple cabinet design plus the gray and black color scheme and operating control layout give the SX-111 an attractively clean and modern look. The entire receiver weighs about 36 pounds.

A look at the block diagram in Fig. 1 shows a striking resemblance in tube line-up to the SX-111's big brother, the SX-101A.1 The receiver starts off with a 6DC6 r.f. amplifier. An antenna trimmer adjustable from the front panel permits rescaling the input circuit. The manual r.f. gain control, which is tied into the first r.f. amplifier stage in addition to other stages, aids in preventing overloading by strong signals.

Following the r.f. stage is the 6BY6 first mixer, $V_2$, and the tunable local oscillator, $V_3$. Here the incoming signal is converted to the first i.f. of 1650 ke. Good frequency stability in the local oscillator is assured by the use of air trimmer capacitors, ceramic coil forms, temperature compensation and voltage regulation. These two stages along with the r.f. amplifier are gang-tuned.

The 1650-ke. signals from the first mixer are amplified in the 6CB6 i.f. amplifier, $V_4$. The receiver's 8 meter, calibrated in 8 units to 60 db. above 89, is a part of the i.f. amplifier's plate circuit.

After amplification in $V_4$ the 1650-ke. signals are converted to 50.75 ke. by the second mixer, $V_5$. Either 1600- or 1700-ke. injection is provided for by the crystal-controlled oscillator, $V_6$, for selection of either lower- or upper-sideband reception. The changeover is made by the flick of a switch on the front panel.

The 50.75-ke. signal goes through a bridged-T notch filter,2 which helps to reduce heterodyne interference by notching out unwanted carriers, and then into a 50.75-ke. amplifier, $V_7$. The five bandwidths are all centered on the same frequency, 50.75 ke., which is at one edge of the

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1 "Recent Equipment," QST, October, 1957.
2 "Recent Equipment," QST, December, 1955.
widest (5 kc.) band, so that the band width “grows out” to one side as the selectivity decreases. This is convenient for s.s.b. and c.w. reception, in contrast to a variable-selectivity system which expands symmetrically about a center frequency as the band width is increased. After amplification the signal is detected by a diode rectifier, \( V_{DA} \).

An a.v.c. rectifier, \( V_{DA} \), picks up its i.f. input from \( V_7 \), and applies a.v.c. to the r.f. amplifier, \( V_b \), first mixer, \( V_5 \), and the first i.f. amplifier, \( V_4 \). The a.v.c. can be used in c.w. and s.s.b. reception, as well as for a.m. It has fast attack and recovery, the receiver gain being practically fully restored even in the small time interval between dotes and dashes, with keying at ordinary hand speeds. The recovery time is not adjustable. If desired, the a.v.c. can be turned off from the front panel.

The 12AX7 beat-frequency oscillator, \( V_{BA} \), can be turned on and off from the front panel, independently of the a.v.c. There is no panel-operated b.f.o. tuning control, since the sideband-switching system requires that the b.f.o. frequency be fixed in definite relationship to both the i.f. pass band and the exact frequencies of the two crystals in the second conversion oscillator. The b.f.o. oscillator plate voltage is regulated to insure frequency stability.

The receiver’s front-end components are grouped along the right in this photograph with the oscillator compartment at the top, mixer in the center and the r.f. at the bottom. Ceramic coils and air paddles capacitors are used in the oscillator section to insure good frequency stability. The cylindrical can at the lower center is a shield covering the notch-frequency inductor. Various projections along the rear apron at the top of the photograph are, from left to right, a.c. line cord, speaker terminals, S-meter zero set, mute terminals, antenna input terminals (coax fitting is visible between the screw terminals) and the band-switch shaft support.

A series-diode noise limiter, \( V_{SC} \), can be switched into the circuit to reduce interference from pulse-type noise. Of course, this type of limiter is most effective on a.m. reception.

Audio circuits of the SX-111 include a 12AX7 voltage amplifier and a 6AQ5 power amplifier. Output impedances of 3.2 and 500 ohms are provided.

A 100-kc. crystal calibrator, \( V_{CL} \), enables accurate checking of the dial calibrations. Fig. 2 shows how a semiconductor rectifier is used as a harmonic generator, a feature not usually seen in run-of-the-mill calibrators. The use of the crystal diode insures strong marker signals in the top frequency range of the receiver.
The SX-111 power supply uses a 5Y3GT (V12) full-wave rectifier and an 0A2 (I13) voltage regulator. Regulated plate voltage is applied to the b.f.o. crystal calibrator and the high-frequency oscillator. Regulated screen voltage is used on the first mixer, Vs, and the 1650-ke. I.f. amplifier, V4. The power requirement of the SX-111 is 83 watts at 115 volts a.c.

An 8-watt 2000-ohm resistor connected across the 115-volt line, ahead of the on-off switch, and mounted near the receiver’s front-end components, heats the front-end area to keep it free of moisture. The constant heating makes the temperature change less severe when the receiver is turned on, reducing over-all drift.

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Strays

To keep the record straight on the HBR-16, the Stray on page 35 of the April issue (HBR-16 Notes) was in error in saying that the specifications for C7 and C8 should be transposed in the caption for Fig. 1 of the original article in October 1950 QST. We misinterpreted Ted Crosby’s letter on this point. The specs in Fig. 1 are O.K.; it was the reference to them on page 17 of the article that should be transposed. But either way, remember that it’s worthwhile making slight changes in both values to see if you can optimize the receiver’s performance.

The 14th edition of the World Radio Handbook is now available from Gilfer Associates, P. O. Box 218, Grand Central Station, New York 17, N. Y. This is a 200-page listing of broadcasting stations all over the world, giving hours of operation, frequencies, program schedules, and so on.

Of great interest to our Canadian friends will be the Radio Amateur Licensing Handbook, which is written specifically for the would-be amateur in Canada who wants study material for the Canadian license exams and who wants detailed information on licensing procedures in Canada. The author is Jim Kitchin, VE7KN, and the 100-page book is published by Radiotelephone Directories of Canada, Ltd., 119 West Pender St., Vancouver 3, B.C., at $2.00.

“CQ Serenade” is the name of a song for which words and music have been written and published by VE2BR, VE2QS, and P9KT. Sheet music is available, as well as a 45 r.p.m. recording made by VE2QS and his orchestra. VE2QS, who bears a resemblance to Xaviar Cugat, can be reached at 1310 Elizabeth St., St. Laurent, Montreal 9, Quebec.

A 2-meter Goenet Communicator Model 3057, serial #CM-14457, was stolen from the civil defense room in Rutherford, N. J., earlier this year. Anyone having information on this unit should contact, L. C. Sanford, W2LKW, Municipal Building, Rutherford, N. J.

In addition to the usual antenna and audio output terminals, connectors at the rear of the SX-111 include a phono fitting for a coaxial lead-in and a two-terminal muting connector tied into the receiver’s manual r.f. gain-control circuit. The muting terminals are closed by a jumper wire when the send-receive switching is done from the receiver’s panel controls, but may be operated through a remote switch on relay design. The muting circuit is fast acting and substantially clickless, and can be used with a back-contact relay tied in with the keying system for c.w. break-in.

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E. L. C.

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On board the U. S. Navy carrier Shangri La KISRA has permission to operate his ham station while the ship is enroute from the Pacific to the Atlantic. The USS Shangri La departed San Diego on March 16 and after going around the Horn, will arrive in Norfolk, Va., the 6th of May. Look for KISRA on 15- and 20-meter sideband.

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The Meter Reader Gang of 160, a group of teenagers in southern Iowa, is looking for new members. They hang out near 1820 kc., every night at 1900, and anyone interested in joining up should contact K2TNJ, Box 105, Voca, Iowa.

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Hamfest Calendar

(Continued from page 10)

Saturday, May 7, at the Dayton Biltmore Hotel, Space doesn't permit listing all the scheduled activities, but those who attend will find plenty to capture their interest, Technical talks, net meetings, informal get-togethers, hidden transmitter hunts, license examinations, equipment exhibits, v.h.f. and s.a.h. diners, and a grand banquet are some of the features on the program. Advance registration deadline is May 5; $5.50, including the banquet. For full information, and for reservations, contact Dayton Hamvention, P. O. Box 426, Dayton 1. For hotel reservations at the Biltmore, contact the Dayton Hamvention Reservations, Biltmore Hotel, 210 N. Main St., Dayton 2. There will also be a special program for the ladies, and the v.h.f. and s.a.h. diners will be held on Friday evening.

Pennsylvania — The Breen Shooter's Net annual hamfest will be held May 22 at "The Lodge" in North Park, Pittsburgh. No further details available at this writing.

Wisconsin — The 1960 Waukesha hamfest will be held on May 21 at St. Therese's School in Schofield. Sponsored by the Wisconsin Valley Radio Assoc., meetings will start at 1 p.m. Registration will begin at 9 a.m., and a banquet will be served at 6 p.m. The price is $3.75 per person, and there'll be activities for everyone. Send for reservations to Registration Chairman, WYRA Hamfest, Box 363, Waukesha.

South Carolina — The hamfest of the Blue Ridge Radio Society and the Greenville Radio Club will be held on May 1 at the American Legion Fair Grounds on White Horse Road in Greenville. Master of ceremonies will be W4MVR. Activities begin at 0900, with a swap table, "Chicken and fish" will be served at noon, with all you can eat for $2.00. For small fry there will be a special plate at $1.00. For further information contact C. D. Mullinix, K4TOY, P. O. Box 1368, Greenville.

QST for
The authors have managed to find space in G3KEP’s three-wheeled Frisky Sport not only for themselves but for the gear described in the article.

A Low-Power Transmitter-Receiver for 160 or 80 Meters

Low-Frequency Mobile

BY DAVID NOBLE,* G3MAW AND DAVID M. PRATT,** G3KEP

The modern trend in mobile equipment seems to be toward the separate transmitter and receiver or converter arrangement. While this in itself is quite satisfactory in other respects, it does not result in maximum conservation of space—a vital consideration where the average small European car is concerned. For this reason, it was decided to make the receiver, modulator and transmitter in a single cabinet, with a vibrator power supply in the trunk. The complete unit is assembled on a \( 10 \times 7 \times 2^{1/2} \) inch chassis which fits into a \( 11 \times 8 \times 7 \) inch cabinet. (Closest U.S. sizes are 10 by 8 by \( 2^{1/2} \) inches, and 14\( 1/2 \) by 8 by \( 8^{1/2} \) inches.)

Because of the limited battery capacity, low power was essential. On 160 meters the maximum input power permitted in the United Kingdom is 10 watts. Therefore, this band was chosen because of the proportionately low competitive QRM level. Coil dimensions for the 75-meter band will also be included for those who prefer this band.

Transmitter

The transmitter is primarily crystal controlled, although provision is made for feeding in an external v.f.o. The oscillator comprises a 6BA6 in a Pierce circuit. Six crystals are provided, the desired one being selected by means of a seven-position, two-pole rotary switch, \( S_1 \). The seventh position is taken to a coaxial socket, \( J_8 \), at the rear of the chassis for connection to an external v.f.o. if this is desired. The power amplifier is a

Mobile operators who are tired of trying to buck the nighttime QRM on 75 may find relief in going to 160. Not only is the theoretical ground-wave coverage better on the lower-frequency band, but the power-level restriction in force at the present time also makes competition less severe. For those who prefer it, the unit is easily adapted to 75.

5763. The pi-network output coupling is designed to feed directly into the whip antenna. Because of the comparatively low power involved, ordinary broadcast-type variable capacitors are adequate in the output circuit.

Modulator

Heising modulation of the plate and screen of the 5763 is effected by means of an audio section common to transmitter and receiver. The modulation inductor \( L_4 \) may be any small choke

In this view, the receiver section is on the left and transmitter on the right, with the audio section at the rear of the chassis. A row of crystals occupies the central area.

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Fig. 1—Circuit diagram of the low-frequency mobile transmitter-receiver. Resistances are in ohms, and resistors are 1/2 watt unless otherwise indicated. Disk ceramics are recommended for fixed capacitors having values from 1000 μμ to 0.01 μμ. Fixed capacitors of smaller values, not listed below, should be mica or ceramic; larger values should be paper, except for capacitors marked with polarity which are electrolytic.

BT — 3-volt A battery, or flashlight cells.
C1, C2, C3 — Silver mica.
C4, C5, C6 — Mica trimmer.
C7 — Triple-gang 100-μμ, variable (Bud MC-888).
C8 — 1000-μμ, mica.
C9 — See text.
C10 — Midget superhet variable, broadcast replacement type, sections in parallel (Allied 61 H 008).
C11 — Dual t.r.f. variable, broadcast-replacement type, sections in parallel (Allied 61 H 059).
J1 — Open-circuit jack.
J2, J3 — Closed-circuit jack.
J4, J5 — Chassis-mounting coaxial receptacle (SO-239).
K1 — 6-volt d.c. six-pole double-throw relay (see text).
K1, K2 — 1.8 Mc., Approx. 23 μμ, on iron-slug form (Miller 21 A225R1B).
Antenna coil 28 turns No. 28 at ground end of L1.
—4 Mc., Approx. 6 μμ, on iron-slug form (Miller 21 A68R1B).
Antenna coil 5 turns No. 28 at ground end of L1.
L1 — 1.8 Mc., Approx. 15 μμ, on iron-slug form (Miller 21 A155R1B).
Tickler 20 turns No. 28 at ground end of L1.
—4 Mc., Approx. 4.6 μμ, on iron-slug form (Miller 21 A476R1B).
Tickler 5 turns No. 28 at ground end of L1.
L1 — Filter choke (see text).
L2 — 1.8 Mc., Approx. 54 μμ,—80 turns No. 24, 1-inch diam., 2½ inches long (B & W 3016 or Airdux 8327).
—4 Mc., Approx. 27 μμ,—40 turns 1½ inches long, same as above.
M1 — 30-ma. d.c. meter.
R1 — Linear potentiometer.
R2 — Audio-taper potentiometer.
R3, R4 — See text.
S1 — Two-section 1-position rotary switch, 7 positions used (Centralab PA-2005).
S2 — D.p.d.t. toggle switch.
S3, S4 — S.p.d.t. toggle switch.
T1 — Standard or miniature 455-kc. permeability-tuned i.f. transformer, input (Miller 12-C1).
T2 — Same as T1, but for output (Miller 12-C2).
T3 — Carbon-microphone transformer.
T4 — Universal speaker or output transformer, 4500-ohm primary, 8 watts (Stancor A3825).
of a six-pole change-over relay. This is operated from the heater supply and may be switched by either of two toggle switches—the first on the chassis itself (S1), and the other on the dash for easy accessibility. In the receiving position (shown in Fig. 1), Pole 1 of K1 (with S2 closed) connects plate voltage to the receiver, and Pole 2 connects plate voltage to the audio section. Pole 3 connects the input of the audio amplifier to the detector output. Pole 4 connects the output of the audio section to the headphones and speaker transformer T4. Pole 5 connects the antenna to the receiver input. Pole 6 is shorted to ground.

With K1 energized through S2 (or the remote switch), Pole 1 connects plate voltage to the transmitter oscillator and to S4A. S4A connects the plate-supply input terminal of the final amplifier to the supply either directly for c.w. operation, or via Pole 4 and L4 for phone. Pole 2 applies plate voltage to S4A which is open in the c.w. position but which supplies plate voltage to the modulator in the phone position. Pole 3 connects the microphonic transformer T4 to the input of the audio section. Pole 4 connects the modulator output circuit to the r.f. amplifier when S4 is in the phone position as mentioned above. Pole 5 transfers the antenna to the receiver, and Pole 6 closes the microphone circuit.

The unit requires 300 volts at about 90 ma., and 6 volts at 3 amp. The antenna is a loaded 12-ft. whip mounted at the rear. The car, incidentally is only a bit over 9 ft. long.

1 If a six-pole relay is not available, two relays having poles totaling six may be substituted.

Silent Keys

This is with deep regret that we record the passing of these amateurs.

W1JIM, Homer B. Smith, Gloucester, Mass.
W1ZIF, Durward L. Tracy, North Troy, Vt.
W2BCW, Larry Spector, Brooklyn, N. Y.
W2DAH, Dr. W. Richmond Moyer, Lockport, N. Y.
W2ER, John J. Vale, Valley Stream, N. Y.
W2FXV, Louis J. Rogers, Brooklyn, N. Y.
W2HIF, William J. Robinson, Camden, N. J.
W2LJ5, George W. Rust, Bronx, N. Y.
W3BIA/5, Albert K. Poole, Philadelphia, Pa.
W3EFS, W3LAI, Dr. W. L. Beiton, Philadelphia, Pa.
W3NW, Joseph T. Marsden, Roxbury, Pa.
W3ONH, Dr. Willard P. McNeill, Spencerville, Md.
W3RYF, Didrik J. Oadle, Landover Hills, Md.
K4ABB, W4PTZ, Urban J. Kessl, Oaklee, Ill., Fla.
ex-W4CIC, Henry G. Sandifer, Lasalle, Ky.
w5BOX, Andrew J. Burton, Enid, Okla.
w5GGR, Jerrold Oliver Hills, Rule, Texas
w5MMU, Louis H. Hudson, Natchitoches, La.
w5Q4S, Harry A. Carlson, Jamestown, N. Y.
w5AELT, George C. Hermann, La Canada, Calif.
w6BFC, Alpha A. Weber, West Covina, Calif.
w6DVU, G. Manley Cole, Corona, Calif.
w6HIL, Arnold L. Harrington, South San Francisco, Calif.
w6OPP, Donald B. Tallman, Bakersfield, Calif.
w6SKZ, Carl E. Sann, San Diego, Calif.
w6SSW, Alexander H. Gies, Los Angeles, Calif.
w6STF, Ford L. McGeaw, Glendale, Calif.
w6WUO, Frederick O. Hoffman, Santa Monica, Calif.
w7TLY, Bennett S. Hyde, Flagstaff, Ariz.
w7U3K, Edgar M. Wood, Ogdensburg, N. Y.
w8FXN, Herbert H. Mills, Reynoldsburg, Ohio
w8GHC, Harry B. Richards, Princeton, W. Va.
w8HTP, Brooks M. Walker, Zanesville, Ohio
w8KD, Carl H. Wesser, Presque Isle, Afton.
w8TGC, Philip N. Macy, Greenfield, Ind.
w9GZK, Walter H. Wickstrom, Kenilworth, Ill.
w9JYA, Howard V. Champness, Beech Grove, Ind.
w9STB, Ernest K. Newlin, Terre Haute, Ind.
w9WPTK, Richard C. Edsall, Springfield, Colo.
Kl7BMZ, Harry C. Sprague, Kodiak, Alaska.
L9JVE, Colin H. Gratton, Buenos Aires, Argentina
V23AI, A. H. Keith Russell, Toronto, Canada
VE2FF, Frederick George Donnell, Chemainus, British Columbia

25 Years Ago

May 1935

...The issue 25 years ago was devoted to details of new receiver circuits and tubes. George Grammer discussed various 10-meter rigs at the 28 Mc. band took an upswing after nearly four years of silence on 1X. ...CT2BK reported on his excellent results with a reflector system on his antenna...James Lamb gave readers a look at outstanding technical features on latest manufactured models of microphones.

...The DX Contest report claimed that all previous records were smashed to smithereens. More than 90 countries participated and ON4AU worked Ws and VE 5Qs on five bands, running up a score of 25,500—the highest continental score in early reports.

...The final report on the 1931 Sweepstakes also proclaimed all records shattered. 970 operators participated and "scores were of previously unheard magnitude...nineteen over 70,000!" W9HIC won the affair with a score of 119,270.

...Most of the Editor's correspondents 25 years ago were complaining bitterly about phone harmonics and conversation of phone men.

...The Editor commented on bootleg operation in the five-meter band with non-hams buying cheap sets from mail-order houses and giving themselves a thrill by going on the air. Radio clubs and individual amateurs were urged to tackle dealers and non-licensed operators.

...Technical articles included notes on the V-doubler noise-reducing receiving antenna...progress in ultra-high-frequency wear...receiver selectivity characteristics...push-pull-pulse oscillator circuits for 15-watt second-harmonic output...and three pages of hints for the experimenter.

...And in the back of the book, an eager fellow offered to trade an adding machine and a 23-jewel watch for telephones.

Quest Quiz

We trust you didn't allow yourself to be missed last month by the four loop currents. Redrawing the circuit and properly labelling the three loop currents, you should have obtained an answer of $E_{out} = 3.7$ volts.
All amateurs are invited to participate in the Eleventh Armed Forces Day amateur radio program on Saturday, 21 May 1960, co-sponsored by the Director, Naval Communications and the Military Affiliate Radio System (representing the Army Signal Corps and Air Force Directorate of Communications-Electronics).

Transmissions will be at twenty-five words per minute on the following schedules:

**Time 21 May 1960** | **Call Sign | **Frequencies (Kc.)**
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2200Z | WAR/AIR (Army & Air Force Radio) | 3347, 14,405, 20,994
(2200-EST) | Wash., D. C. | Wash., D. C.
2200Z | NSS (Navy radio) | 3410, 4010, 6070
(2200-EST) | Wash., D. C. | Wash., D. C.
2200Z | AG6AIR (Army radio) | 6097.5, 7575.5, 7575.5
(1900-PST) | San Francisco, Calif. | San Francisco, Calif.
2200Z | NPG (Navy radio) | 3319, 7535, 7535, 7535
(1900-PST) | San Francisco, Calif. | San Francisco, Calif.
2200Z | NPD (Navy radio) | 7455, 7455, 7455
(1900-PST) | Seattle, Wash. | Seattle, Wash.
2200Z | AG6AIR (Hamilton) | 7322, 7322, 7322
(1900-PST) | AFR, Calif. | AFR, Calif.
211000CT | NDT (Navy radio) | 2287.5, 5454.5, 5454.5
(0000 India) | Kamakura, Japan | Kamakura, Japan
2200Z | 9427.5, 16,445, 23,010 | 9427.5, 16,445, 23,010

Each transmission will commence with a ten-minute CQ. It is not necessary to copy more than one station and no extra credit will be given for so doing. Transcriptions should be submitted "as received." Time, frequency, and call sign of the station copied shall be indicated as well as the name, call sign, and address of the individual submitting the copy.

Part two of the program consists of a radioteletypewriter transmission featuring a special message from the Secretary of Defense. Each participant who submits a perfect copy of this message will be awarded a certificate of merit signed by the Secretary of Defense.

Transmission will be at sixty words per minute on the following schedule:

**Time 21 May 1960** | **Call Sign | **Frequencies (Kc.)**
---|---|---
2200Z | WAR (Washington, D. C.) | 3347, 14,405, 20,994
(2200-EST) | Washington, D. C. | Washington, D. C.
2200Z | NSS (Navy radio) | 3410, 4010, 6070
(2200-EST) | Washington, D. C. | Washington, D. C.
2200Z | AG6AIR (AFB) | 6097.5, 7575.5, 7575.5
2200Z | AG6AIR (Hamilton AFB) | 7322, 7322, 7322
(2100-CST) | A6USA (Army radio) | 6097.5, 7575.5
(1900-PST) | San Francisco, Calif. | San Francisco, Calif.
2200Z | NDV (New Orleans, La.) | 3319, 7535, 7535
(2145-CST) | NDV (San Francisco, Calif.) | NDV (San Francisco, Calif.)
2200Z | NPD (Seattle, Wash.) | NPD (Seattle, Wash.)

Each transmission will commence with a period of ten minutes of test and station identification. At the end of the test period, the messages will be transmitted. It is not necessary to copy more than one station and no extra credit will be given for so doing. The message should be submitted "as received." Time, frequency, and call sign of the station copied should be indicated as well as the name, call sign, and address of the amateur concerned.

Part three, the highlight of the armed Forces Day amateur radio activities, features a military-to-amateur transmitting and receiving test, and will be conducted for all holders of valid U. S. amateur radio station licenses. Headquarters radio stations of the Army, Navy, and Air Force will operate on spot frequencies outside the amateur bands, establish radio contact with amateur stations, and acknowledge these contacts with a one-time Armed Forces QSL card. Each service headquarters station will acknowledge separately so amateurs will have an opportunity to qualify for three different QSL cards.

Military stations WAR, NSS, and AIR, will be on the air from 200000Z (1800 EST) to 220000Z (2400 EST) on 21 May 1960 to contact and test with amateur radio stations. Amateur contacts will be discontinued from 2200Z to 2300Z to allow Armed Forces Day c.w. and RTTY broadcast competitions. Military stations will operate on spot frequencies outside the amateur bands as follows:

<table>
<thead>
<tr>
<th>Military</th>
<th>Amateur</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Station</strong></td>
<td><strong>Appropriate Frequencies (Kc.)</strong></td>
</tr>
<tr>
<td>WAR (Army radio)</td>
<td>4020 (s.m.)</td>
</tr>
<tr>
<td>Washington, D. C.</td>
<td>3.8 to 4</td>
</tr>
<tr>
<td>4025 (s.a.b.)</td>
<td>3.8 to 4</td>
</tr>
<tr>
<td>6097.5 (c.w.)</td>
<td>7.2 to 7.2</td>
</tr>
<tr>
<td>29094 (c.w.)</td>
<td>21.1 to 21.25</td>
</tr>
<tr>
<td>NSS (Navy radio)</td>
<td>4010 (c.w.)</td>
</tr>
<tr>
<td>Washington, D. C.</td>
<td>3.8 to 3.8</td>
</tr>
<tr>
<td><em>4012.5 (s.a.b.)</em></td>
<td>7.2 to 7.24</td>
</tr>
<tr>
<td><em>3319 (RTTY)</em></td>
<td>3.8 to 3.8</td>
</tr>
<tr>
<td>6071 (c.w.)</td>
<td>7.2 to 7.2</td>
</tr>
<tr>
<td>7735 (RTTY)</td>
<td>21.1 to 21.25</td>
</tr>
<tr>
<td>14358 (s.a.b.)</td>
<td>14.25 to 14.3</td>
</tr>
<tr>
<td>14380 (c.w.)</td>
<td>14.2</td>
</tr>
<tr>
<td>201075 (c.w.)</td>
<td>21.1 to 21.25</td>
</tr>
<tr>
<td><strong>203050 (RTTY)</strong></td>
<td>see note</td>
</tr>
<tr>
<td><strong>Air (Air Force radio)</strong></td>
<td>3347 (c.w.)</td>
</tr>
<tr>
<td>Washington, D. C.</td>
<td>3.8 to 3.8</td>
</tr>
<tr>
<td>7635 (c.w.)</td>
<td>7.2 to 7.3</td>
</tr>
<tr>
<td>14405 (s.a.b.)</td>
<td>14.2 to 14.35</td>
</tr>
<tr>
<td>15715 (c.w.)</td>
<td>14 to 14.2</td>
</tr>
</tbody>
</table>

*Operator transmitting on 4012.5 (s.a.b.) will listen in the a.m., s.a.b., sections of the 40 and 75 meter bands for a.m. or s.a.b. stations.

**NSS will key 20,050 kc. simultaneously with one of the RTTY frequencies listed above. This frequency will be utilized as frequency propagation conditions dictate.**

Military stations will listen for calls from amateurs within the appropriate amateur bands. Contacts will consist of a brief exchange of location and signal report. This is a test of military-to-amateur communications and no traffic handling or message exchange will be permitted.

Competition entries submitted to the Armed Forces Day Contest, Room BE-1000, the Pentagon, Washington, D. C. should be postmarked not later than 31 May 1960.
A PLAN FOR IMPROVED UTILIZATION OF AMATEUR PHONE ASSIGNMENTS

139 Beckman Road
Summit, New Jersey

Technical Editor, QST:
The major deterrent to 100 per cent effective communication with other amateurs is QRM. Since the old spark days, QRM has been with us. Many improvements in the reduction of transmitter band width and increasing receiver selectivity have been made in the past forty years, but at the same time we have increased in numbers twentyfold -- so QRM is still with us. In fact, it is worse than ever, with hundreds of high-powered transmitters joining our ranks every month, adding to the thousands already on the air.

Despite the increasing use of single sideband, a casual examination of the logs of yesteryear will undoubtedly reveal that s.s.b. and a.m. operators alike are suffering a reduction in their operating enjoyment as it becomes increasingly difficult to communicate with others. Can we do anything to check or reverse this trend? The answer is an emphatic "yes."

Two changes in our operating practices are required on our crowded phone bands. One is to utilize a voluntary carrier-frequency allocation plan in the United States during the hours of peak amateur activity. The other is to take advantage of single-sideband communication to the fullest extent by the use of "interlaced" single-sideband transmission.

Under the FCC rules you can operate on any carrier frequency (or carrier-reference frequency, in the case of s.s.b.) between 3800 and 4000 kc, as long as one sideline doesn’t hang out on either end of the band. But it should be quite obvious that random carrier frequency selection creates terrible heterodynes to mar everyone’s a.m. reception, and the random admixture of sideband components on both a.m. and s.s.b. due to random carrier frequency selection also reduces everyone’s ability to obtain the desired intelligibility from the background mess of incoherent voice components. However, if everyone sticks to selected frequencies, the interference in the main will “speak English” instead of the present cacophony of whistles, pops, squeals, moans and semi-coherent speech. If you are convinced that your “s.s.b.” (communication-to-noise ratio) can be improved by eliminating this sort of QRM you have been properly prepared to examine the proposed 75-meter carrier allocation plan shown in Table I in an objective manner.

If you and the majority of 75-meter men use it, it will increase everyone’s a.m., but it means giving up the practice of hunting for a hole in the QRM except at the carrier frequencies listed in the table.

The allocation table covers both American and Canadian telephone assignments in the 3750-4000-ka. band. For a number of reasons which will be discussed later, the use of a 4-ka. carrier-frequency separation is recommended. This gives us 50 U. S. carrier frequencies (3999.0 kc. cannot be used for a.m.) and 13 additional exclusive Canadian carrier frequencies (3751 kc. cannot be used for a.m.).

It should be stressed that the writer is suggesting the voluntary use of this plan and that it is a part-time plan to be used primarily from 5 p.m. local time until 75-meter phone activity dies down around midnight. During the balance of the day or night, activity on 75 is so limited it is not necessary to employ the plan, although it will do no harm to adhere to it all the time.

Now that we have established a carrier-frequency allocation table, it is time to look into this “interlaced sideband” business which was mentioned a few paragraphs back. We can define single-sideband interlacing as the simultaneous transmission of two different voice signals in substantially the same pass band using a suppressed-carrier upper-sideband signal to transmit one voice and a lower-sideband suppressed-carrier signal to transmit the other voice.

Yes, O.M., sideband interlacing works FB, as you can readily determine for yourself from that best of all teachers, your own experience. Pick up a partner to experiment with, zero in on a lower-sideband round table, note the frequency, move down the band 4 kc., and flip to upper sideband.

Where did the round table disappear to? The answer, in part, is that the power in human speech is far from uniform throughout the range of voice frequencies. Studies of

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Table I

| Carrier-Frequency Selection Chart for A.M. and Interlaced S.S.B. Telephone 3750-4000 Kc. |
|---------------------------------|---------------------------------|---------------------------------|
| 3751.0                         | 3835.0                         | 3919.0                         |
| 3755.0                         | 3839.0                         | 3923.0                         |
| 3759.0                         | 3843.0                         | 3927.0                         |
| 3763.0                         | 3847.0                         | 3931.0                         |
| 3767.0                         | 3851.0                         | 3935.0                         |
| 3771.0                         | 3855.0                         | 3939.0                         |
| 3775.0                         | 3859.0                         | 3943.0                         |
| 3779.0                         | 3863.0                         | 3947.0                         |
| 3803.0                         | 3877.0                         | 3951.0                         |
| 3807.0                         | 3881.0                         | 3955.0                         |
| 3811.0                         | 3885.0                         | 3959.0                         |
| 3815.0                         | 3889.0                         | 3963.0                         |
| 3819.0                         | 3893.0                         | 3967.0                         |
| 3823.0                         | 3897.0                         | 3971.0                         |
| 3827.0                         | 3901.0                         | 3975.0                         |
| 3831.0                         | 3905.0                         | 3979.0                         |
| 3835.0                         | 3909.0                         | 3983.0                         |
| 3839.0                         | 3913.0                         | 3987.0                         |
| 3843.0                         | 3917.0                         | 3991.0                         |
| 3847.0                         | 3921.0                         | 3995.0                         |
The distribution and intensity of all vocal phonetic sounds indicates that, with exception of a few inaudible between 3 kc and 5 kc, the predominant energy is between 250 cycles and 2800 cycles. As every sidetuner knows, you can take advantage of this fact and lay off the voice frequencies above 2.7 kc, and below 250 cycles without hurting intelligibility. A second factor is that the speech components of the unwanted sidetone are inverted by the carrier inserted to select the wanted sidetone. This inversion process converts the unwanted speech components into incoherent noise.

This action is illustrated in Fig. 1, where the upper sideband of one voice transmission and the lower sideband of another are interlaced in a pass band 4 kc wide. Here we find that the major portion of the signal energy of one sideband is laid on top of the other. Only relatively unimportant high-frequency components of the unwanted sideband appear in the receiver pass band. The high-frequency components of the unwated sideband are converted to noise by the low-frequency noise when they beat against the inserted carrier frequency; conversely, the unwanted low-frequency energy is converted to high-frequency energy, but the sharp receiver i.f. cutoff eliminates most of it when the receiver is tuned to the desired signal as shown in Fig. 1.

If the carrier is inserted at 2905 kc, the situation will reverse itself. If both carriers are inserted in the i.f. of the same receiver, both upper- and lower-sideband voices can be heard with a minor shift in tuning.

By eliminating a.m. carrier heterodynes and improperly interpolated sidetones through the use of pre-planned carrier-frequency selection, the QRM generated by those already in communication will be reduced by a substantial amount. The "haze note" (for voice seeking a QRM) will have a much easier time of it in finding a spot to call CQ or answer a station calling CQ. The probability of establishing communication is thus increased. The amount of QRM that is generated in trying to establish communication will be decreased. This, in turn, will increase the probability of carrying existing QSOs through to successful conclusions. In short, everyone's life, can be improved with a bit of self-discipline in the choice of carrier frequencies in our phone operation. This also will permit the use of interlaced sidetone a.m. operations, thus doubling the number of voice channels for this type of operation and giving the increasing horde of sidetrackers a substantial amount of relief in their efforts to find talking space in the band. We have nothing to lose but the chains of operating habits that had their origins in practices that were forced upon us by the limitations of the equipment we were using the distant and not-too-distant past. Precise transmitter frequency control is available to everyone today, just as the woods are full of hams with extremely-attainable communications receivers with a.m., l.s.b. and u.b.b. outputs.

Just use the frequencies in the allocation table the next time you're looking for a "clear" band and don't worry about whether George does or not. If 20 per cent of the stations on the air use them, the probability of successful QSOs on other carrier frequencies will start to decrease very rapidly, while those "on frequency" will obtain many more contacts.

D. A. Griffin, W4AOB

THREE-BAND SINGLE-CRYSTAL CONVERSION OSCILLATOR

The interest in crystal-controlled converters for the higher-frequency bands prompts me to send you the accompanying circuit. The conversion oscillator technique might be of value to those whose wallets may be described only in two dimensions.

The 3.5-Mc. crystal is used on the 3rd, 5th, and 7th overtones to cover, respectively, 20, 15, and 10 meters. Oscillator switching is accomplished by switching trimmer capacitors in the Butler oscillator tank circuit. On all three bands the tuning capacitance is fixed in series with the crystal. The oscillator is on the low side and the i.f. starts at approximately 3.5 Mc. Since the overtones are not harmonically related to 3.5 Mc, there is a slight displacement of the lower band edges from the 3.5-Mc. tuning position of the receiver. This amounts to about 8 kc for 20 meters, 9 kc for 15 meters, and 10 kc for 10 meters with the 3005-ke. crystal (Peterson type Z-2) now in use; a 3302-ke. crystal of the same type gave a larger offset for 20 meters and a larger dispersion between 20, 15, and 10 meters.

IT BEATS US, TOO.

James A. Murray, Jr., W4TR

W4TR's single-crystal oscillator circuit for covering 14, 21 and 28 M.c. in a crystal-controlled converter. The 3rd, 5th and 7th overtones are used for the three bands. The oscillator tank circuit should tune to the oscilolation frequency in each case—approximately 10.5 M.c. for 14 M.c., 17.5 M.c. for 21 M.c., and 24.5 M.c. for 28 M.c. Separate tank circuits of ordinary design can be used, but W4TR simply switches trimmer capacitors with a single coil, as shown. This requires that L/C1 tune to 24.5 M.c. with a low value of capacitance at C1, in order to achieve a reasonable L/C ratio at 10.5 M.c. The value of C1 should be adjusted to give the desired coupling to the mixer. (Note: The grid of the left-hand triode should connect to the top of the 20K resistor.)

and a larger dispersion between 20, 15, and 10 meters. It is interesting to note that the 7-Mc. band could be beat down to 3.5 Mc. by using the fundamental frequency of the crystal, but the oscillator signal would come directly through the mixer at the crystal frequency and so would the second harmonic of the crystal, which falls in the 7-Mc. band. Three possible solutions suggest themselves: One is to use a second crystal somewhat lower than 3.5 Mc. for the 40-meter band only. Another is to accept more of a dispersion of the higher-frequency bands and use a single crystal with a frequency a little below 3.5 Mc. The third method would be to use a crystal with small dispersion among the higher-frequency bands but one which would permit tuning 40 meters with the oscillator on the 3rd overtone (about 10.5 M.c.). In this case the 7-Mc. band would tune backward, from about 3.5 Mc. to 3.2 Mc. It has been assumed that the overtones will be lower than the harmonics of the fundamental, which is my experience with the two crystals mentioned.

A converter such as this with some 40-meter provision would be a valuable accessory for one of the 3-4-Mc. Command-set receivers.

James A. Murray, Jr., W4TR

Technical Editor, QST:

Here's one that "has me beat," and since none of my acquaintances can offer a logical explanation, I'm passing it along to you for comment.

During the winter we had a very severe ice storm here. Freezing rain fell for over 24 hours. Everything was heavily coated with ice, including my antennas. The antennas were frozen down and sagging rather badly, so I thought I'd see if operating for a while would help melt the ice.

Accordingly, I fired up on 40 meters, using my man-fed half-wave dipole, and after about an hour's operation went outside to inspect the results. I was mildly puzzled to see that half of the antenna was clear of ice and the other half (from the center insulator out to the mast) appeared to be as iced as before. I scratched my head a bit but rationalized that since the half that had melted was partially over
the roof and thus was warmed by reflection of the sun on the roof and heat escaping from the house, the ice on this half melted first.

I have paralleled 10- and 30-meter coax-fed dipoles on top of the house. I could repeat the experiment on them and eliminate the roof as a differential factor. So, I worked 10 meters for a while and again went outside. One half of the 10-meter dipole was clear of ice. The other half was still iced up—and the ice half ran near the chimney where it had a chance of being warmed! The 30-meter dipole was still completely iced. Naturally, I then tried the same thing on the 20-meter dipole—and again noted the same results. Half melted and the other half (again near the chimney) didn’t melt.

Now, I can accept the melting on the basis of dielectric losses in the ice and heating of the wire with resistance loading even if the same currents and voltages occur in each half of the dipoles why wasn’t the heating effect the same?

—Alfre C. Forn, Jr., K3DHA

Polarized Relay in the RTTY Converter

170 Pearl St.
South Braintree
Boston 85, Mass.

Technical Editor, QST:

I enjoyed the article by W6QLY in the December issue on teletype conversion, although I have not had an opportunity to build the equipment. The comments which follow are on the use of the keying relay. K1 (refer to my article, “Some Hints on Relay Operation,” June 1956 QST).

The use of a Sigma 7107-100T (160 ohms per coil) is justified only if the ham already owns one or can get one at a bargain price. This relay has not been manufactured for about five years, but it is practically identical with Type 7107-100T still being made. If either of these two is used, it is not necessary to run it “biased” i.e., with keyed current in one coil and fixed current in the other. If the parallel 6AQ5s are eliminated and a 6SN7 or equivalent substituted for the second trigger tube (12AU7 in Fig. 2) the relay should operate properly with one coil connected in each plate circuit. The grid bias should be adjusted so that each half draws about 15 ma., when conducting.

However, for vacuum-tube circuits running with 200 volts or more of “B” supply, a higher coil resistance is more suitable since it operates on less current. The “ideal” relay for the job would be one with dual 1000-ohm coils. In decreasing order of cost these would be the 7107-1000T, 7AOZT-1000T, and 7ROZT-1000T. They differ only as to their enclosures, the first being hermetically sealed, a feature not needed by hams.

We breadboarded the second trigger stage, using the 12AU7 only, placing each relay coil in series with the load resistor (these were changed to 10,000 ohms). The 6AQ5 stage was omitted entirely. Operation was entirely satisfactory. The reversal accomplished by switches S2a and S2c could be handled either by reversing the coils or by reversing the fixed contacts of the relay, suggest the circuit modification shown in the accompanying sketch. The 3000-ohm potentiometer enables one to correct for any imbalance in the tube currents. Perhaps increasing the 100K feedback resistors would permit returning the grids to ground instead of to –45 volts. But, we have not tested this stage now reverses the contacts of K1 and S2c is not required.

Hams wanting more dope can get it from me at the above QTH.

—J. B. Stein, Jr., W1BIY
Sigma Instruments, Inc.

Slow-Scan Tests Coming Up

81 Winsoe Circle
Elmira, New York

Technical Editor, QST:

Because amateur modulators have poor low-frequency response, it is necessary to use some form of audio subcarrier modulation when transmitting slow-scan images with conventional ham gear. In the tests made to date, the video signal has amplitude-modulated a 3-kc. tone (April QST, page 36). This type of signal is quite susceptible to fading, however, and theoretical considerations, borne out by the experience of commercial facsimile, indicate that superior results can be obtained by varying the frequency of the tone rather than its amplitude. By amplitude limiting the received audio signal in the picture reproducing equipment, the effects of fading should be greatly reduced.

The FCC has granted W2BZC permission to make slow-scan transmissions on 10 meters during the month of May for the purpose of comparing the subcarrier s.a.m. (s.a.m.) and subcarrier f.m. (s.c.f.m.) methods of modulation. It is hoped that a number of amateurs will want to participate in the test program. Slow-scan transmissions, alternating between s.a.m. and s.c.f.m., will be made on approximately 23.5 Mc., Saturdays and Sundays during May. The received signal can be tape-recorded just like any other audio; the tape may then be sent to W2BZC for reproduction. Tapes will be returned to the sender along with a photo showing a picture reproduced from the tape. The mailing of tapes to W2BZC should be preceded by a letter giving particulars; the equipment used, conditions, and preferably a short expendable sample of the tape. Skeds are preferred over blind transmissions although the latter will be made to the extent which time permits. Suggested schedules, planned for times when reception of New York signals is usually good, may be sent to W2BZC.

For best results, direct electrical connection should be made between the receiver and tape recorder. Sometimes an audio coupling transformer is needed to prevent hum; an ordinary output transformer, with the primary plugged into the receiver headphone jack and the voice-coil secondary into the recorder mike jack, should be satisfactory. The tape tension on both sides of the recorder capstan should be approximately the same for maximum “wow”; in this connection, small reels should be avoided for recording although they are, of course, satisfactory for mailing the tape. Record level is something of a problem. The tendency is to over-record s.a.m. since the sync pulses do

Suggested alternative circuit using a dual-coil plate-circuit type relay, for the radioteletype converter described by J. L. McCoy, W6QLY, in January 1950 QST. The relay should have 1000-ohm coils. Suitable Sigma types are the 7107-1000T, 7AOZT-1000T, 7ROZT-1000T, and 72AOZT-1000TG.
not usually show up on the magic-eye or meter-type record-level indicators. To prevent crushing the sync pulses, then, s.c.m. should be recorded with the “eye” about 1/3 closed. In s.c.m., it is important that some audio be recorded on the tape even when the signal fades into the noise. Some over-recording is permissible if it is found necessary in order to record the bottoms of the fades. The s.c.m. and s.c.m. transmissions will be identified as voice, and of course station identification will be given every ten minutes. — Constance MacDonald, WAIJBW

TROPOSPHERIC SCATTER
General Telephone Service Corp
730 Third Ave
New York 17, N. Y.

Technical Editor, QST:
The article by Mr. John R. Amend, WTUHY, on “Radio Propagation” in the February, 1960 issue of QST is a very good presentation of this complex subject.

Mr. Amend did not mention the various fading effects encountered on the microwave frequencies and in connection with tropospheric scatter propagation. It is necessary for commercial-grade communications (usually defined as 99.99 per cent reliability) that consideration be given to the effects of fading when planning microwave systems. It may be of interest that the AT&T Co.'s TD-2 microwave circuits, which operate in the 4-kMc. common-carrier band, were engineered for a 40-db. fade margin. The Lordult Type 74 microwave installations, used by General Telephone companies in the 6-kMc. common-carrier band, are usually designed to provide for 35-40-db. fade margins.

Frequency diversity is used in both of these line-of-sight microwave systems to overcome the adverse propagation effects.

Tropospheric scatter circuits such as the Florida-Cuba installation often require both frequency and space diversity operations to approximate commercial-grade telephone reliability requirements. Special receiver combining techniques are employed to maintain the continuity of transmissions.

In general, line-of-sight microwave circuits with frequency diversity protection can provide multi-channel telephone channels with reliability comparable to wire lines. The same thing, however, should not be expected of radio circuits utilizing ionospheric or tropospheric scatter types of propagation. — David Talley, W2PF

Technical Editor, QST:
I agree with WTUHY's statement ("Radio Propagation," QST, February, 1960, page 23) that the amateur "reader will profit from an awareness of the state of the art as supplied by industry," and to this end want to enlarge upon his tropospheric scatter explanations.

Until just a few years ago tropo-scatter path losses of around 200 db. were the maximum allowable losses consistent with state of the art. In 1955-1957 the Lincoln Laboratories of MIT conceived a single-sideband multichannel tropo system which was built by the Communication Products Department of the General Electric Company and now provides the Air Force with communications between Thule, Greenland and Cape Dyer on Baffin Island, a total distance of 691 statute miles. This system has a path loss of 258 db. . . . This system utilizes 120-foot parabolic reflectors, quadrature-diversity reception, 2-db. noise-figure receivers, and 20-kw. p.e.d. s.s.b. amplifiers in the 350-450-Mc. region. Prior to 1957 most tropospheric systems utilized the frequency-modulation mode but s.s.b. has its proponents in this service, too.

During development of this system a domestic path approaching the eventual Arctic path was picked with sites near Boston, Mass., and Winston-Salem, N. C. So the story goes, during construction a certain 2-meter enthusiast used to climb the 40-foot antenna feed tower at the Boston site during lunch hour with his 2-meter Comet for a few QSOs. Imagine how the credibility of "I'm running 7 watts and the antenna here is a 120-foot parabolic reflector" was questioned.

In summary, s.s.b. with its advantages is now providing a practical multichannel tropospheric scatter system over a 700-mile span, almost ionospheric-propagation type distance. Real DX for tropo! — Richard A. Powell, WJNJS

D.S.B. BALANCED MODULATOR

Technical Editor, QST:
In connection with the d.s.b. system described in April QST (Rockafellow, "High-Level Balanced Modulator for D.S.B.") carrier suppression does not seem to be obtained from 100 through 10 meters, but the higher frequencies offer more of a problem. This is probably because of the greater effect of tube capacitances at these frequencies. The method of balance control shown at A in the accompanying figure seems to help this condition at the higher frequencies. Also, some of the fellows might like a p-network output tank. The circuit can be rearranged to use one as shown at B. In this arrangement the phase reversal is accomplished in the grid circuit and an additional tuned circuit is required. — Stuart Rockafellow, WBNJH

Circuit for adjustment of modulator balance (A) and high-level balanced modulator circuit using p-n-network output tank (B). Values in these circuits are similar to those given in April QST, page 23 (WBNJH).

May 1960

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Do you find your QSL card in the above batch? Well, if the answer is yes, chances are that you are fairly new at this Sweepstakes game. The above are a sample of the cards W1AW received after the 1950 Sweepstakes franchise; cards were received primarily from those who never before had worked the headquarters station. But this was only a trickle compared to the log avalanche that swooped down upon that thoroughfare which travels under the guise of 38 LaSalle Road. C.w. log entries were submitted by

BY JOHN F. LINDHOLM,* WIDGL

1556 contestants, a near par performance compared to last year’s configuration. Which all leads to another question often attributed to that G6 and master of the quill, Bill Shakespeare.

“What’s in a name?” Take Sweepstakes for instance. To an Irishman, Sweepstakes is a battle of nags on a muddy track. To an American housewife it’s a chance at winning a couple grand by sending in a coupon to your favorite TV sponsor. To each it’s a shot in the dark at big money, provided Lady Luck chooses not to turn her back as stubs are drawn from the mass. And what does Sweepstakes mean to hamdom, that tiny kingdom nestled amongst the bugs, 6146’s, handbooks, tri-benders, logs, and dupe sheets? Ah, something exciting and wonderful — that glorious grind of a contest. Involved is no money, no luck — well, not much anyway — just hard work, sweat and tears, but more an infinity of fun ... bliss in knocking your brains out trying to beat out the fellow across the fence for a measly sheepskin. To each participant Sweepstakes has a special significance. Perhaps some of those exclusive moments are captured for you by the following analysis of that endearred word Sweepstakes. Examine. What is in a name?

S is for the sections that so masterfully eluded you in the waning moments of the contest. Was it that VE8, KZ5, or Vermont perhaps?

W is for the thoughtful, unforgetting, understanding little wife who brought you sandwiches

* Ass't. Communications Manager, C.W., ARRL.
W9IOP (right) receives the Francis A. Burke (W3AAK) Memorial Award from W8DUS, president and W9IOP’s boss at Electrical Voice. Larry scored 1336 contacts in 73 sections for 243,056 points, a new SS high. This trophy, donated by W3GJY, is presented annnually to the top SS scorer, in memory of deceased amateur, W8DUS was kind enough to make this fitting presentation in behalf of W3GJY.

when you were hungry, whispered words of encouragement into your ear when despondent, lighted your cigarette with the onset of a nicotine fit, brought you slippers when the footsteps got nippy, and threw you out of the house when the control was over, you good lazy crook.

E is for the energy that you burned in wearing out two bugs, 37 pencils, and one left foot.

E is also for the emergency that developed when smoke billowed forth from ye olde de transmitter. Why does it always wait for a contest to malfunction?

P is for the power multiplier of which you are almost everybody decided to take advantage. You were running under 150 watts weren’t you?

S is for the satisfaction of knowing that you put forth your best effort. If you didn’t get a chance to jump in head first this year, there’s always next year, as the saying goes.

T is for the time you devoted to your grand effort. Maybe you couldn’t fit in the full forty hours, but it was fun for event forty minutes.

A is for the ability you had to contrive down at the club meeting, after not living up to expectations.

K is for the kilowatt for which you yearned, when the QSO per hour average sank way down to almost nothing.

E is for the extra little bit of effort that the section winners displayed in overcoming the trying moments of various types of adverse conditions.

S... well, S is for Sweepstakes itself — the sum total of operating joy. En masse, all contest operating frolic jumbled into one word. S is also for the stations themselves that participated... those stations which all are proud to see both in enumeration and score.

From coast to coast... from Podunk Hollow to Snoopy Falls, Idaho... from One Horse, Yukon to Bab-O, Canal Zone... did the Sweepstakes bug (order Lepidoptera) take its
toll. The Eastern seaboard, up New England way, the land of the Pilgrims and Paul Revere, found real hot races in Maine, New Hampshire, and Eastern Massachusetts. In the latter, two El-Ray buddies battled for the top slot with W1DDF/1 winning the East Mass. certificate with 176,021 points; fewer contacts than W1GOU, the clean sweep of 73 paid off. In N. H. K1JDN made a bold attempt at the prize by running a kw., but the multiplier beat him out by a whisker, as W1CUL came through with 97,185 points. And “down Maine” W1BOD whistled past W1GJK to the tune of “shave and a hair cut — two bits” by a mere 1000 points to post victory in the Pine Tree state. Reminisced much-travelled W1SWX/1: “I certainly enjoyed operating SS in Vermont those past two years. Had more fun than when I won for South Dakota in 1952. But where was Idaho? I should have gone there instead of Vermont.”

Moving over to the stomping grounds of Peter Stuyvesant and Henry Hudson, K2DGT whopped up 222,870 points via 1276 contacts in all 73 sections to capture N. Y. C-L. I laurels and lead all other W2/K2 clan. Meanwhile in Eastern New York, CD Party enthusiast K2EIU squeeked by K2UPD by virtue of having four more sections. And soothsayer K2MWK forecasts: “Before the 1965 SS I predict (1) stations close to 300K; (2) fifty stations above 200K; (3) Novice scores above 75K; and (4) second and third place certificates for runner-ups in active places like E.P.A., L.A., Ohio etc.”

W3A/MVE3 wouldn’t mind having contests on other days than Sundays, for “preaching and contests don’t seem compatible.” But that didn’t halt the top Canadian scorer, a Lutheran minister, from pouring the soup into an 80 meter doublet, 40 meter ground plane, and tri-band quad to score 154,851.

May 1960
C. W. WINNERS, 26TH A.R.R.L. SWEETSTAKES

Section | Call | Score | Transmitting Equipment | Receiving Equipment | Bands Used
---|---|---|---|---|---
E. Penna | W3NQ | 232,688 | GSB100-813 | 75A4, HR0MO | 80, 10, 20, 15, 10
Md.-Del.-D. C. | W3DUX | 224,489 | Ranger | 75A4, 8130, 81, 40, 20
N. J. | W3HWD | 175,950 | DX100 | 8130
W. N. Y. | W3MKR | 191,143 | Phoenix II | 8130
W. Penna. | W3LJY | 105,849 | 8100
Illinois | W9YFV | 216,056 | Apache | 8130, 8100
Indiana | W9HUP | 243,658 | P60-AQS-1-6S5a (p.a.) | H14QX
Wisconsin | W9DK | 208,258 | P80-807-813 | 75A4
No. Dakota | K9WY | 75,190 | HT8-814 | 8130
So. Dakota | W9DWM | 122,304 | Ranger-Counter | 8100
Minnesota | K9KM | 78,148 | Ranger
Arkansas | K9HT | 77,000 | DDX100 | 8100
Louisiana | W9YDYC | 269,875 | VO-811AX | 51000-8100
Mississippi | K8EU | 116,135 | Ranger
Tennessee | K4LP | 221,820 | HT52 | 8130
Kentucky | W9XV | 203,082 | HT2CA, Ranger-4-129 | 8130
Indiana | W9YVR | 110,705 | HT2CA, Ranger-4-129 | 8130
Ohio | W9LQ | 186,030 | HT2CA
N. Y. | K2EU | 146,304 | VO-807-813 | 8130
N. Y.-C.-L. I. | K9CTF | 233,160 | VO-811AX | 8130
N. J. | W2DMLJ | 175,500 | Subtractive-75T; Collins VO-807 | 8130
Iowa | W9FSE | 170,510 | DDX100 (modified) | 8130
Kansas | W9BYV | 65,772 | Ranger
Missouri | W9DUR | 148,300 | 8130
Nebraska | W9TV | 163,002 | 8100
Connecticut | W1HP | 156,023 | 8100
Maine | W1BCD | 98,325 | 8100
Mass. | W1DOR/1 | 178,021 | DDX100; Elmac 8100
W1W | W1E0B | 146,381 | VFO-2526-65A-1-4000 (p.e.) | 8130
N. H. | W1CUL | 97,185 | 29-26-516
N. Y. | W1BM | 117,075 | VO-2526-65A-1-4000
Vermont | W1GM | 78,239 | 6A 150-65-64-813-807-813
Alaska | K1CUDF | 103,806 | Collins 3110, KWM-1-Coutry
Idaho | K8S | 211,148 | VO-807-813
Montana | K7BV | 75,743 | VO-807-813
Oregon | W2HA | 120,120 | VO-811AX
Washington | W9BC | 209,150 | VO-807-813
Hawaii | K6KHA | 69,699 | Ranger
Nebraska | W9KEV | 181,336 | VO-811AX
San Diego | W9NM | 181,760 | VO-811AX
San Francisco | W8SJ | 181,458 | VO-811AX
San Francisco | W9S | 122,053 | 8130
San Joaquin V. | W8BM | 190,165 | Ranger
No. Carolina | K4HEX | 158,134 | VO-811AX
So. Carolina | W8BWZ | 80,655 | VO-811AX
Virginia | W4KFC | 238,710 | VO-807-813
West Virginia | W3DLE | 238,710 | VO-813
Colorado | W9DVF | 269,750 | 8130
Utah | W9DQJ | 76,015 | VO-811AX
New Mexico | W4RC | 145,005 | VO-811AX
Wyoming | W9HRM | 89,690 | 8130
Alabama | K4C7D/4 | 133,890 | 5783, 7873, 6166, 813
Florida | W4DOS | 201,901 | 8130
W. Virginia | W9EQ | 120,450 | 8130
Georgia | K4BA | 137,741 | HT8-807-810-1000-1001
East Indies | K3AO | 62,310 | Ranger
Philippines | K2TDT | 76,938 | VO-813
Los Angeles | K6CF | 218,050 | VO-807-813
Arizona | W8V1 | 161,300 | 8130
Santa Fe | W9V5 | 211,150 | 8130
Coral Zone | K9XH | 70,024 | 8130
So. Texas | K5LZ | 197,000 | 8130
Maine | W9V1 | 161,300 | 8130
Quebec | W2RZ | 78,920 | HT2CA
Ontario | W2AIH/VE3 | 154,851 | HT2CA
Manitoba | VE2A | 93,780 | 8130
Saskatchewan | VE2DZ | 53,568 | Ranger
Alberta | VE2MA | 45,870 | 8130
B. C. | VE7CE | 92,833 | 8130

The Quaker territory of William Penn produced, as usual, a multitude of entries from the Frankford ensemble sowing the seeds of rivalry galore. After forty grueling rounds with Mike Murphy, W3JQX outscored other high-scoring E.F.U. stations with 1275 QSO's in 73 sections, for 22,688 points. A tear should be shed throughout the land, such as to fill a reservoir to service the city of Philadelphia, for W3BES and W3ALB, both scoring over 200K, but yea no section certificate to show for it. The Western part of the state with far less rugged competition, nevertheless, produced a real race to the wire with W3GYJ breaking the tape just ahead of W3YDK by a minute 400 points. And across the Chesapeake, contest author W3EIS posted 221K, nabbing all 73 sections.

In the territory of Sir Walter Raleigh, there is but one who reigns supreme—Vic Clark, W4KFC, leading the Potomac Valley posse with 238,710 credits by 1313 QSO's in 73 sections. Dredge that Philadelphia tear reservoir and pitch the brine into the harbor of Newport News in memory of W4YHD with 219K and W4QR.
You think it’s impossible to be neat and score high besides? Well gander at this Willys, for this is really something to behold. Believe it or not this log is the original log used during the contest, not copied over afterward. And to ensure against duplicate contacts a check sheet, KFC-style. Yep, this immaculate masterpiece belongs to W4KFC. How does your log compare with this acme of perfection?

THE CASE OF THE MISSING OP AID NO. 6

STOP CALLING ME YOU CLOD I’VE ALREADY WORKED YOU THREE TIMES

with 210 K, neither of whom bagged a certificate. K4LAY offered: “I hope Alabama was well represented this year. Our club really tried to get some stations on the air, as we saw in previous years only a few contacts were turned in by stations in our fair state.” As W4FFF (not stuttering) mumbled: “The receiver didn’t konk out as in 1955 (got new 75A4); antennas didn’t fail as in 1956 (put up cubical quad); and the h.v. transformer didn’t short as in 1958 (got two pole pigs). But W4DQS moved here from W8-land. What a shock to get his number 1155 for my 1017 at 2100 Sunday evening. Oh well, next year I’ll take my vacation in November, again.” Anyone bet up those key-twisters: W4KXV and W4KVX?

The cry, “Remember the Alamo,” and the frolic of the Mardi gras, bring us to the Fives where W5YDC invaded 40 meters, which coupled with his usual one-band 20 meter effort, cloistered Louisiana and W5/K5 entrants with 290,735 points. South Texas winner K5LZO again had to battle W5WZQ tooth and nail with 177,000 to W5WZQ’s 175-903. In the Northern part of the range W5MCT eluded the onslaught of K5VLN.

No, this is not the V.H.F. section of QST... for those of you who recognize the striking resemblance between W1HDO, QST’s V.H.F. Editor, and K6HAA, Hawaii winner shown here in garb characteristic of our newest state.

May 1960
The quaint mission and the ery of gold at Sutter's mill focuses our attention on sunny California where San Diego's W6ZYV led the steady with 211K. In the meantime rockets were firing across East Bay as W6KG and K6QHC were both striving to be on target... the winner W6KG with 181,588 by 995/73 to K6QHC's 178,034 via 970 contacts likewise in 73 sections. By the way, W6DNM (age 12) posed this question: "I wonder if I'm the youngest ham to go over 3000 in the 88?" A resounding negative reply comes from Texas' 10 year old, and three year SS veteran K5IWL at 57,340 points!

Amongst the craggy Rocky Mountains first ascended by Rogers and Clark, to the shores of the Great Salt Lake first spied by Brigham Young, to the Columbia Plateau, battle royals were taking place. Not only were two stations closely vying for a section bouquet in Seven-land, but sometimes as many as three or four stations were entangled at the head of the list. Topping all the Seven's was Washington's W7HMQ with 205,313 with 1215/73; W7YGN drove in a close second with 201K. Oregon winner W7HJA with 120,420 had to beat out K7BBD with 119,458 with W7TDK trailing a close third with 114K. Arizona nearly ended up in a three-way dead heat: K7IDI with 104,300 points, however, bested W7UMS with 101,430 and W7ZMD at 100,555. Races like these can leave the log checkers with ulcers.

Moving over to the Great Lakes, region of the French and Indian Wars of yesteryear, offers no letup. W8LQA retained his Ohio crown with 186,059, but W8QHW or W8IBX nearly de-throned the Ohio king this year. Gasped the Buckeye state winner: "With such strong Ohio competitors as young W8QHW and younger W8IBX coming up stronger each year, I don't know just how much longer I can hold out." Over in Michigan K2SIL keyed the W8SCW rig to 119,595 points to nose out would-be winners W8PXA, W8APN, and W8DSU, the latter courageously attempting to win without the low power multiplier.

The explorations of Father Marquette draw our attention to Nine-land, where a stellar performance was registered by W9IOP. Larry's peerless performance netted him 1336 contacts in all sections to score 243,056, an all time high Sweepstakes mark, earning his own record set in 1957 as W2IOP of 239,246 and 1298 QSO's. Thus a new contact record... a new scoring record in the 1959 SS! But Larry's gold ring achievement will be up for grabs in next year's merry-go-round. Incidentally W4KFC also broke the old W2IOP record. Meanwhile up north, Wisconsin's W9RQM brought home the bacon for the 14th year in a row. How many logged K9IND as Indiana? Nope... it's Illinois!

The scene next shifts to the Badlands, the Black Hills, the Grand Canyon, and the sod of the Midwest. W9CDP led the Colorado contingent as well as all the Zeroses. Newcomer K9SLD placed high quickly and might prove formidable opposition in years to come... score: W9CDP 200,750 and K9SLD with 160,600.
Anybody get tangled up on W6CQP and W6DCP? Big Mo entrant W9RTD scored 73 x (73 sections in 73 contacts). And latest word is that K8SCM is not... an SCM I mean.

The Royal Moutnies set the tempo for the action north of the border. Particularly hard scrapping up this year were VE5, VE6, and (whew!) VE8... a late hour appearance of VE9TO and VE8HI saving the day for many S8ers. Nomination for longest call goes to W6AIIH/VE6, as well as nomination for top Canadian score with 154,851 points. Kudos to the “Rev” for struggling with that ungodly elongated call to 850 QSO’s plus the clean sweep.

NOVICE CERTIFICATE WINNERS

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Representing our baby state to the North, Alaska, was KL7CDF... like if you missed him you could hardly nab that nifty multiplier. Hawaii, gem of the ocean and our newest state, was captured by K6HAA with 79,696 points. Regarding Katsuhi, WSSS penned: “When K6HJ/1 called me (he seemed to be answering CQ’s and not calling CQ himself), it rather threw me, for I copied his call in error as K6B1/1 and it wasn’t until after we had exchanged messages that it dawned on me with whom I was in QSO.” The West Indies were represented by KP4A0O, although many a S8er had to rely on KV4AA for their lone W.I. contact. Another “toughy” Canal Zone found K2STD handling ’em out and inking in his log: “I had to stop several times to explain GMT, as well as give a geography lesson as to the location of the Panama Canal Zone. It was a real pleasure representing my zone in a small way.”

As phonettes imply phone, and this concludes the c.w. highlights, we’re reminded of next month’s phone and club totals sequel by these phonettes concocted for his own call by W2PA2: “Pretty — Awful — Zecore...” as tents across the gritty desert collapse from excess hot air.

Soapbox

“I trust those who asked last year, ‘Were was W9QOP?’ have been answered satisfactorily.” — W4QYP...

“...transmitter power supply blew up the first Saturday, crippling my effort the first week end. I built a new supply and had a fine time the second week end. This was the only time Murphy came knocking... and that was enough.” — KBVX...

“The relay in my electronic keyer would occasionally stick after the keyer got hot, and found myself tacking across onto my low numbers. Believe a couple of fellows fainted when they heard the resultant high numbers.” — W5JRE...

“I put up a two-element beam described in QST and found that it works F.B...” — K9SAEJ/9D...

“I just couldn’t pull some of the gang through the noise of our movie projector which operated extensively the first week end. Toughest sections seemed to be VE5, Wyoming, Maritime, and KL7. hi.” — K7CDF...

“...This contest really improves your c.w.” — W5JSHS...

“...No break-downs in equipment, just the operator.” — K7LNX...

“High points of the contest for me were when W6QDRC said I was his 73rd section and when I worked W1UU in New Hampshire for my 50th state.” — K7DAS...

“These traditionally ‘rare’ sections came slowly, most of the sections from here were K2S with K2STD on 28 M.C., being the only one heard, and Maritime, with only one VE1 and VO heard. VE8NII and VE9TO were a welcome pair on the last evening of the contest.” — W4KFC...

“...Simple arithmetic tells me I’d have a better score with 100 QSOs in 70 sections than with 600 QSOs and 73 sections, but every year my willpower fails me, and I waste time looking for the rare ones. Guess that’s just one of the things that makes the S8 the S8.” — W1DVR...

“Sure a feeling of accomplishment to finally get all 73 sections.” — W4WUJ...

“Bands

Packing Dakota Derringers in their operating schedules are these two section winners. Left: Posting victory in No. Dak. was 16-year old K0IVQ with 75,400 points; station control unit on right is home design and brew. Right: Meanwhile, in So. Dak. W6SMV paced the field. Active in radio since 1934, Dale once was a communicator with the Civil Aeronautics Administration in Nebraska, and his Chief was none other than W4KFCI

May 1960
"Talk about Murphy's Law—Mesirov's (W3INQ) makes the Irish look like a piker. The first time I changed bands, I lifted the main control switch, but the mercury relay in the primary lead to the transformer didn't open, grounding the B-plus. The overload relay didn't open, and the circuit breakers didn't click. I spent about 30 seconds the entire rig and power supply went up in a blaze of smoke and sparks. The interlock saved my life. After getting the rig running again, the foam from a coke bottle completely covered my cross-check leaving it a sticky mess and Jersey tomatoes, among the juiciest in the land, graced my log sheets after I tried eating a sandwich." — W3INQ.

sounded like a million loaded humide beams," — K9HN.

"Greatest contest ever! What happened to Wyoming, Montana, and Idaho? Never heard any stations there. Took three years to work W1AW, but finally did so!" — K9HIG.

"The SS was great; I picked up two new states and a soggy pizza which fell on the floor in my excitement," — WA9EKE.

"I spent more time on the road looking for refreshment tubes than I spent on the air," — K9MMW.

"The XYL, K9OAK/2, not only got the coffee but did some fine bug twisting too," — W9DVT.

"Sure was sick when KL7CDF disappeared under my nose," — WA9DPT.

"Worked four WAs and all of them were Utah, hi," — WA9EIE.

"It took a half hour to land VESTO," — K9QYI.

"Never again with a broken arm, I hope," — WA9DPT.

"A twenty-one story skyscraper just to the east of my two and a half story residence certainly didn't help me very much," — W9FZV.

"I gave up and went squirreled hunting," — K9QW.

"Had a real riot in SS this year; managed to complete WAB," — K9BLO.

"Roy, the fan I put behind the transmitter sure kept it cool as a cucumber," — K9TYJ.

"First week end a screen resistor blew in the power supply; the second week end my see beam became a long wire when an ice storm took down one leg and then the receiver went haywire. SS still isn't all too bad though," — K9ABY.

"With three different coax leads to change, heavens knows how many VESs were lost," — W9INJ.

"Would be interesting to know how many contacts were made during the contest. Never heard so many stations with numbers over 500 before. Bet it would approach close to a half million contacts," — WA9KEV.

"Is Mississippi still in the Confederacy?" — WA9BEH.

"It must be merely coincidence that nobody east of the Sierra Nevadas answers weak California stations unless there is a contest going. During Sweepstakes my ninety watts mysteriously was heard for the first time in Washington, D. C., Idaho, and (I) New Hampshire," — K9ZJP.

"New electronic keyer worked like a charm although the operator wasn't too adept in its operation. I missed all Saturday's second week end because of a real rocking party. Conditions were good and record breaking performances are to be expected," — K9JEX.

"Thought this SS was the best so far, but what happened to the K25/4?" — K9JWJ.

"We operated under simulated emergency conditions two miles from our home location in a garage on a nearby hillside farm. All cooking was done in the open and all eating in the hay loft," — W9ISP.

"Recognized a lot of familiar calls previously worked as W5RHI in past contests," — K1QCP.

"I really got a big bang out of my first SS," — K9JIF.

"Believe it or not, I can see Indiana from my QTH, but went through the first week end without one QSO with Indiana. Finally worked W9RIL in Indiana for my number 508 and 71st section. Was Indiana boycotting this year?" — W9CYL.

"The usually hard-to-get Nevada was much easier than Eastern Florida. Although K9HIG was notably absent on my receiver, again for the second year K16HAA came to my rescue." — W8JFC.

"Introduced my son to Sweepstakes by multi-op setup with him; he did O.K. for his first try," — W9JZM.

"Probably last SS at this QTH; returning to K7L land," — W9FZ.

"I saved bother by turning on electric clock at same time as receiver for time on tally," — K9RTT.

"All contacts with a straight key, wow! Bug next time," — W9ZL.

"If next year with a padlock on my door from the inside, then there won't be any interruptions," — W9KTR.

"I was quite doubtful last summer if I would ever be able to get in SS, as I was in bed with a serious blood condition. I thank the many St. Louis area hams, especially W9ZQV, who made it possible equipment and morse-wise for me to take part. Interesting points for me: 1) A UA1 came back to me on a QSO SS on 15 meters. I missed his session, hi. 2) A KN4 came back to me on a QSO SS on 40 meters. Unusual? Well, I was on 7040 kc. nuff said," — K9CHB/6.

"Suggest we adopt a new Q-signal for 'we have QSOed recently'," — K9RTM.

"My first SS since 1947. I set out to see what I could do with a one-band (7 Mc.) rig with low power and indoor antenna. Average per hour was too low for winning score, but believe this band best for one-band operation. Almost everyone passes through forty sometime during the contest. Thanks for the Operating Aid No. 6. It was indispensable and I was surprised at the number of calls that can be entered on it.
with plenty of blank space left. Passing comments: Local youngster K5QQC, recent graduate from Novice band, running ahead of me, exchanging number 99 for my 53. On maestro W2HOP, running about 50 per hour when contest nine hours old. W4KFC running little behind him, One-way exchange with VE1RW for 60th section. Raised K2STD about same time but claim jumpers elbowed me out of it. Very enjoyable friends, and I'll see them next year if all the powers that be are willing." — W4RKC...

"Was rock bound using only one crystal for this year's contest, so was actually forced to call CQ SS rather than going out on air. It's fun anyhow." — W5RWB...

"Operated mobile with gasoline consumption three gallons or 25 points per gallon." — W4ORB/4...

"After two week ends of SS, how do I explain to my girl friend that I love her more than ham radio?" — W9FYZ...

"Next year I'll pack the family off to Siberia, lock up windows and doors, disconnect the telephone, and really go to work on the old Sweepstakes." — K2BOS...

"Extrapolating from my present curve of improvement, I might break 100,000 by the age of 103." — W7USP...

"Man, was there QRM. I didn't think there could be so many hams on one frequency. I suggest a multiplier of 100 for the one band one crystal Novice." — KNOVQ...

"The power supply on my VFO went to the Happy Hunting Ground, and I dozed through several physics classes, but at least things went better this year than last when I was a Novice the first week and a General the second." — KQBP...

"Can you imagine the thoughts of foreign hams, especially those behind the iron curtain, when they hear the blood curdling caused by the SS contest?" — K9GZP...

"My first SS contest was in 1954 as a Novice and have competed every year since. Twice was fortunate to win the Kiassour sheepskin." — W7DOR...

"Was shooting for 1000 QSOs, but had to work most of Sunday the second week end keeping me to 32 hours operating time." — K4CFD/4...

"Commed preparing for SS early and put up a tri-band beam, 400 foot long wire, and dipoles for 10 and 40. A Q'k wheel is employed as well as a W7TO electronic keyer." — W4DQS...

"As the plot of ground here is small, I put up temporary antennas for 40 and 80 during the SS, then take them down after the contest is over. I do so much work getting ready for SS that the contest itself is an anti-climax. I just bought an acre of ground on a hilltop, and look forward to an antenna farm which will stay up all year round." — W5DHT...

"The transmitter is homebuilt and designed to be used in conjunction with a 73A3 receiver. The receiver VFO is fed to the transmitter to permit tracking between the transmitter and receiver. Bandpass filters are used on each band and the power amplifier circuits for each band are independently tuned. Bandchange is thus accomplished with a single switch with no retuning necessary. I feel that these two features contributed materially to my score in the SS and reduced fatigue." — K6CBP...

"Thanks for a really big contest! Saw a lot of my old friends and enemies too, I didn't do too bad. Matter of fact, I did lousy. One thing for sure, I'll do better next year, for I can't do much worse." — K3PTM...

"I must admit I don't particularly like SS, but I'll do it next year with more time and a better score." — K14A00...

"More QRM than ever before, but not from VE1, VE9, or So, Carolina!" — W6RST...

"Just about gave up getting Canal Zone, but he finally showed up on 7 Mc; guess this is the first time I have ever gotten 73." — W6NKR...

"Big kick was when a UA answered my CQ SS and offered a number. What section is Moscow in?" — W6QCP...

"By increasing my power 900% to 75 watts, I was able to increase my score last year by 072. Today, the day, the time and energy of 50 watts?" — W6UFJ...

"Confined to 40 meters but was surprised with some of the sections I came up with on the 80 watt rig to an eight foot high antenna." — W6CQPM...

"I am in favor of a .75 multiplier for those, like me, who have to study for quarter final exams on SS week ends, and a .75 multiplier for those who called 'CQ SS' longer than three times." — W6JJO...

"My first SS since changing, my call to the contest. The gang made the most of it 90 watts, with some 7G4 on SS band. Suggest that next year's SS announcement stress the availability of ARLR Operating Aid No. 0, I lost quite a bit of time the second week end being called by stations 01Q-3000 QSO's before." — K7ID...

"My code speed went up about 10 w.p.m. over the next four days operating." — K7GTC...

"I do not expect to participate in future SS, unless something changes to make it more attractive. My thanks to W1AW for a contact in the SS." — K71KT...

"Man, what a mess! Real glad to work K0DVT for first Colorado, KH6CJ for first Hawaii, and W3DRD for first Delaware." — W4DYM...

"I don't know if I should report my score as multiple operator. Does a Tweetybird Parrotquet trying its best to devour the log sheets constitute multiple operator? Those are the birds nibbling, not me. I did my scratching on my pencils and used up about a gross and never even tasted a one." — W7P0U...

"Wow! Sure a big difference between SS and the Novice Roundup." — K7DVT...

"Just a word concerning the great American pastime, the SS. It sure is a real test of the gear, and the operator of course. When I blew the 6146 in the final, a few disaster calls to local hams netted me some space." — WY7FFC...

"I had a most unwelcome visit from the in-laws the second weekend. Note — a balanced ham puts family first, even in SS (though it may hurt a little)." — K3MBD...

"Glad to help many of the boys complete WAS, for South Dakota it sure is very good. Number of W6SPM...

"My shack has been improved over the years to the point that little can be done to improve scores by improving equipment. My small increase over last year bears this out. For a decent antenna, I would have given up my nice roomy

May 1960

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operating table, the 80-meter hand, my only Idaho QSO, the considerable investment in operating "extras," and a
75A-4, had one on. hi."— K2MWM. "Last SS I
worked, I was in the South Minnesota section!" — WP2UI
(Only you Qs will remember that. — Ed.). "Many
thanks for newly-kern type SS, as usual. With full 180
watts and 39 hours this year, made twice last year's score.
Overall operating proficiency was good but was aggravated
at number of attempted duplicate QSOs. One W2 tried to
work me three times in less than a half hour!" — K2UZJ.
... "Almost twelve times I moved the power output this year over
last year for a net loss of 12,000 points. This QSO stuff
doesn't pay! Found that no cigarettes and 'way less coffee
this year left me feeling a lot less dragged out after this
contact than any previous. I'll be back next year with my
old 807 for even more fun. This was the best ever and I
especially was gratified by the new crop of CW op.s, opera-
tors." — W2ZBO. Whooped picked the date of 3 Dee
for reports to be postmarked is no contest man! By the
time I realized that they had to be in that soon, it was
too late to get my log all copied. I've operated contests for
twelve years and don't remember having to mail results to
this quick. Hope you'll be more considerate in the future."
— W2WZQ. "... I could see a considerable improvement
in my operating technique just over one week end. Here's
for more and better contests." — K2FMM. "Of all
work ends to get sick. "My first real SSB was on a friend's roof with no hat on all after-
noon. After sitting at the rig until 0300, I got a terrible
neck and back ache. My AT-1 maintained a 11 QSO-hour rate,"
— K2FHY. "This is about my twentieth SS and
I still get a big kick out of them. The operating tech-
niques have sure improved over the years," — K2LPW.
... "It's sure hard to stay awake in classes on Monday,
hit! — K2FHY. "Don't want to use old standby
marks. Wait till next year." — K2FMM. "Really
enjoyed SS even with 50 watts, crystal control, low an-
tenna, regenerative receiver, with 40 meters on one dot
on the dial, and alarm clocks that failed to function. I now
quote unquote, and mean ancient, Confirms saying
"Wait till next year!" — K2LZD.

C. W. SCORES

Twenty-Sixth 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 in-
dicates power up to and including 150 watts (multiplier of 1.25,
c.w.), B over 150 watts (multiplier of 1). . . . The
total operating time to the nearest hour, when given for
each station, is the last figure following the score. . . .

Example of scores: W3HINQ 2,388,682-1273-7.3-39, or final score 2,388,688, number of stations 1275, number of
sections 73, power factor of 1.25, total operating time 39 hours.
. . . An asterisk denotes Novice certificate winners in sec-
tions where at least 3 Novice logs were submitted. . . .
Multisector stations are grouped in order of score follow-
ing single-operator station listings in each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

<table>
<thead>
<tr>
<th>Call Sign</th>
<th>Score</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>W2JPS</td>
<td>10,503</td>
<td>111-77-4-3</td>
</tr>
<tr>
<td>K2FMM</td>
<td>9,000</td>
<td>109-42-4-3</td>
</tr>
<tr>
<td>K2LZD</td>
<td>6,350</td>
<td>89-42-4-3</td>
</tr>
<tr>
<td>K2LPW</td>
<td>4,000</td>
<td>61-42-4-3</td>
</tr>
</tbody>
</table>

...and so on for all operators in the region.

SS is not kid-stuff to these dears. Left is New Mexico
winner W5CK, with such honors coming right in stride now
after SS victories in '57 and '58, and DX Contest scrolls
for the last two years. Below is W1DMI, who hands out
coveted Vermont QSO's. After having come through for
several contest certificates, the old faithful 813 transmitter
has since been torn down for this RK-65 amplifier.

QST
May 1960

"In order to keep the rig cool enough to stand the grind, I opened the windows in the shack. Soon the rig was cool and the shack more so; 40 degrees I had to wear three shirts, 2 pairs of socks and gloves (which made it hard to key). It kept the equipment cool, the shack cool, and me freezing!"
Like if your gonna get out, have antennas..., says K2DGT with this array. The quad is a homebuilt 20-15-10 affair on a 60 foot tower; in the background towers a tri-band three element "Hy-Gain" stacked over a full size three element TetraX 40 meter (10) beam. The house is thirty feet high.
Whee!

Rumors of a rumble preceded our annual DX Hoggery & Poetry Depreciation Society get-together, so it was not without some trepidation that Jeeves & Co. slithered through a side door into Long Hall where a noisy crush of DX men had already gathered. We accepted schooners of Old Haywire and moved toward inconspicuous gallery seats while chairman Q.R. Emswell fanned his gavel for order. His fanning was unavailing; several more dangerous rounds of 0.H. were propagated before poor Q.R. finally shatterered the gavel in one mighty swing and smashed his fist with an anguished shriek. This worked. The meeting came to order as chairman Emswell, really only pro tem anyway, crawled away sobbing. A few by-pass cadenzas of our beloved Wouff Hong Song followed, and Dimiter Pinner began the 1960 DXHPDS orgy with this intro:

We no longer need be annoyed
By mental ease Ace Maytagroyd
With quicks QSLs
He outwore his pals —
His DXCC now is void.

Then it was Exeter Clausell's turn, and he came through ignobly:

The nastiest pest with a call
Is U. Gottworkmen O'Paul,
Whose kilowatt treads
On rare ones' home skeds
Till they won't work Yankees at all.

Ernest Jummer next rose to the rostrum amid rumblings that sounded strangely like heavy machinery moving about. Ernie loudly declared the demise of a jerk who always called first and listened later:

Alas! for his lidship, MelBoltz,
The last of a long line of doths,
His reflex, "I'll grab it"
Became such a habit,
He shook hands with three thousand volts.

As Roger Andout headed for the podium that curious thundering gave way to the S9 whine of mysterious zero beatings. Something was tuning up. Roger evaded a shower of sizzling Retty-switches and filed this bid for literary obscurity:

A scarless ham from Dunce
Fired up on the island of Squee.
The speed of his card
He was prone to retard
If you failed an appropriate fee.

Suddenly through trap doors in the roof of Long Hall, in the side entrances and on stage, there appeared avenging Whistlers of Gomera, masked and armed with dog X-ray machines that shot forth devastating beams of light and sound. Those Gomeras gleefully played fiery beams over the terrified audience, stampeding us toward blocked exits. Then we realized that their weapons actually were dog X-rays converted to function as hog X-rays! Panic reigned.

Here and there in the milling multitude skeletal pigs among us howled and gyrated under the scaring rays, one by one the miserable creatures reached blinding incandescence and exploded into nothingness like so much phantom popcorn. Dazed by the uproar and the carnage, Jeeves & Co. clawed frantically through a back exit already clogged by glowing, writhing, bursting skeletons. Escape! (But did we only imagine each other's grinning skull beginning to appear under those truth rays from Gomera?)

What:

May usually comes through in creditable DX fashion just before the summer squeeze sets in. But atmospherics are rising on our lower-frequency DX fronts, and east-west propagation untypically stays up on 10 and 15 as the weeks go by. What's more, seasonal DX drops off from now on will be compounded by the steadily sagging summer count. Ah, still plenty of room for optimism, though, if you don't sink all your DX eggs in the 10- and 15-meter baskets. Let's see what the "How's" gang is doing on

40 Phone. Not bad at all, judging from the reports of KG1XL, W3PHL (107 countries on the band), KH4NP and W4RON; GB3MH (2200 ks), GR4DG, CG3ZQ, ZT7X, DJ2NC, DL2AD, EA3ME 38R, EL7A, F46S BG RI, FERAIH, GF2XE. GB3SMI, GDIUB, G2NSP, GM2BUD, H3CJY, HK3EI 11 hours GMT, H3PSL, Ha AIM (95) 4, DFF ZOT, IFISMO, K3H/7/JP4, KG6NAX+ (210), KI6D/PKM6+ (204), KPS+ ALU AKB APW YD, LAs 3G 8J, LX1DE, LZ1s

*3822 West Berteau Ave., Chicago 41, Ill.
40 g.w. "Just as good as 20 they were coming over the morning,"

reinforced ELIA. "Being worked stuff right up to 000 GMT.

In agreement were W1M8X, W2WAS (a fast 48 on 40),

and worked/confirmed countries:

W1V6YR, K4s IEX IDG LRO, K5s IVF SUS, W6KG,

K6s CFJ KTS SXX, W4sHRS, W1L7Z, K9s CFC ICW,

K6s YBF, W1s JIN ZV1, H9s, IVF, JDXC, and

and confirmed "Say what?" whose call chatted up:

CMs 2W8 6AK 4, C4s 2A0 888, C0s 2UK 2P

"Fond of me," said the DXCC to the DXCCs.

(11), E4s 228 888 (22), CCC 9E6, K5s 1K (28) 7-6,

3AD 8A (8) 6, 12E 2B FC, FA6RE, F6A8U (30),

H9s KAG 5KBP 7P, HK17H, HP1AE, FP4s AGA QO TAL, three down

JAI-2-38, JAs 4AIK C5G 7V, 85Q 6AWG 6ALG

7K/M 997 TVZ 7ZF 7ZF 7V1 M 801, 60P, many JAs,

K-As 4AG (25) 6, 6AE (19) 8, KJ9ID, K5W6 (10) 8,

K6M68R, KX6NO (27) KZSTD (25) 4, a flock of KPs,

LS6G/p, LU6ZI (25) 9-7, LX1ID, LZ1s KPA

(KZSTZ), OA6ILX, OA4OBW, OA5OBW, Antaresia,

OX3RH, OY3Z, PJ3AI, marko U/L/PYs,

SM1BGE (11) 4, SM1ZB, SM2AM, FD1FL, TLs CAH

CM17Q, D2s IDG, W1s USS, USS A-5, A2s SAE

KAE (12) 8, KCO (13), KDA (9) 9, KID KZ4A (8)-7,

UB3s 1BI, UX6s DAK, UX6s A-19, UX6s 1AJ

KAE, ULSa 1B (10) 1, ICU LE, UMRKAB, UMINH,

UP1s COM, CO2, UP1s C5L, 982s CPA, QVA,

VIP5s P4L, W6PM (18) 4-5, 16s 6Z0W, 6V5F

5XK6s 9Q0U, YV6s 4AIB 5-4, 4CI 5CO, ZAI6C,

ZC6M, ZDss GUP (4) 4-2, 11F5s ZSUS, 4Xb5s BI

(15), 19s CF, 5AC2V, 96s GCX CB and CY...,

WA6HRS, who acts like she's 7M on 7M, demonstrates,

that you can't keep a good man down nor a good ham quiet.

"XYL found a nice spot out here where no external

antennas are allowed. Swimming pool, carpets, etc.,

but no wires. I'm sitting on a dipole in the attic.

But that didn't work out, so I'm using some invisible (No, 280 wire)

mating a French dipole floor-window and a neighboring orchard. Successes

\[ \text{\[TXF]} \]

80 g.w. got rolling only to be caught head-on in a wall

of static. But W1NBX, W2sAXN, KADGE, W6KG,

W9s JIN ZYD, EL4A, VE6BCL, A. Ruge and ISWI,

delivered the verdict on APR1 (10) 29, DSUSY (11) 8,

E1M, JA3BP (11) 1, JX1Y (2-5) 12-15, OKs in quantity,

P15A (18) 8, SM2BGE, SP6FZ, Us 11Z 3GH 6K1F

(15), K5s YXY, W1s 1BI (8) 7, 85Q (20) 8,

9SA (20) 8, YOSCA, YUI6K, YV6s Z5s 275 (10) 8,

4NX (8) 7, 5AC2V (5) 23 and 9N1RZ (4) 4-5.

"Just can't be done," ONV still aloft on 75 meters,

according to KS6W, knobs twirled.

\[ \text{\[KSA4Z and VP1HH were the best lovely things to happen on 160 as we}

made our way. As W1HB puts it, wait-\text{\[next season - or long before!} \]

10 phone, "With the declining summits, definitely has had it," comments WS4FT.

"The openings have become less frequent and not nearly as solid, too. With inc

HC6JU (HC2JU) was operated among the Galapagos

by HC1JJU aboard the freighter Cristobal Corrales last

December and January. There was no land-based work

and folded dipole sparked a battle of lively pile-ups

nonetheless. (Photo via W1WPO)"
Evidently not a few amateurs believe that WA must be some sort of Varkens-in-Nagorie Prefix. KABJ is really burning the operational oil: "Have sent out 700 QSLs for KABJ's work since October.

Africa - W3KVG, the North American ZD1AW QSL dispatcher, says, "It is doing a good job despite slow service from Sierra Leone. Two of his letters with log data got lost in the mail but it has been a problem trying to get duplicate information. ZD1AW is very cooperative, so ask the boys to be patient on this one."

Roger ZE6/BV is having special cards printed for his worldwide African operations, according to WGDXC, and will get them out from home base. Follow DXpedition originating in ZE6/BV quickly on receipt of a.s.a.p. and necessary IRCs. Notes: observer A. Ruiz, "...I've just taken over the 'African QSL', duties of ZE6/X, advises W3KVG to please send QSLs as recorded, under who the QSLs are to go to. Also, W3KVG would like to know the address to which to send QSLs to Libyans, e.g., SLAL1 of ZE6/L, an ardent stamp collector. Adorn your envelopes appropriately."

In this line, W1WPO, CRYFL tells of his plans to handle CT7RS QSL affairs. The latter is the W1AW of Mozambique, you know. ZE6/BV still has ZE6/X's 700 cards on hand. "My policy is strictly QSL-on-receipt, QSLs via bureau, direct, or via W6JNP will be dealt with accordingly," goes his letter to W1WPO. V3H/G'H prides himself on a return home in March of next year."

Europe - DL6XZ, resident of the Isle of Man, still gladly confirms QSLs made under his old Sandland label, BS44X. SD6XC lists the present DL4 QSL Bureau as DL4HFB, 50th Comm. St, APO 100, New York, who is also still trying to have QSLs forwarded to his old K2XKIO address (which follows) but you may have to contact A direct. K2XKIO is still considering whether or not to try to make QSLs made by other DL4WA licensees now or prior to his own tenure... "Ex-SV9WPW (WFLFC) and YU1RQ tell W3KVG that they require the use of their QSL cards for new QTH. From K3RYP of the SV8KT/Creta gang: "I am taking care of my own SV8WT cards, asking that those QSLs be forwarded via my father, W3KVG." We have one main station log, but I also keep a log of my own operation so I can properly fill out my own QSLs. Several operators here are named Jim; so you should be specified. By the way, my personal call, SV8WT, was previously issued to a man in Athens. I am receiving cards for him but I do not have his log, so I do not know if he is now located..."

Note in the Callbook that there are two possible bureaus for the relay of all 8Y-sound QSLs.

South America - VP4/WD writes via W1TS and 4CXO from his GISTA home QTH: "I have sent QSL cards to all stations who sent cards to me, and will definitely QSL 100 per cent on all contacts which are reported in W3KVG's Argentine circulars by W1TS and others..." But W1TS does not compute near his B507T/VQ5C for 1955 action. "I still have a few of the hand made 8BY cards on hand. Same goes for the 40-meter phone band QSLs, and W3KVG and WGDXC supply a list of every Coast Republic licensee, all FF4s: A.J. Chapin, BJ, 781, Ave. de la Finca 34, Aldate, A.J. Llano, BJ, and it has been sent. ZE6/BV has received your card and mail during. The contemporary W7KOF, listed okay in the Callbook, desires it emphasized that another call sign listed before was W7KOF. The former W7KOF now is W7KOF. ..." "In W2KAM lists Falkland listeners V7P8 AS AC AH AI AQ AS BG BJ VC CW TX DC DE DF DX FA ED EM EZ and FO can be in QSL via the Uruguayan society, RCC. VPs in other localities cannot be received via this route. W3KVG observes the use of "VPSK" for VPSK, GSTM, LG460, LG428, LG429, LG43, LG44 and LG49, and that VPSK has removed to the Virgin Islands but W3KVG is now in W2KMG's Logan's office on file for the period March 16 to February 23, 1966. Don't omit the a.s.a.p. when applying for W3KVG's favors..."

Oceania - KUSH, who operated K16/BV early last year, ponts: 'I recently worked K16/BV for the first time since logging, K16/BV, now operator Dvek, was active as W2C2P/KUSU, now can be reached at U. S. address: R.C. Nelson, USCG Loran Stn, C-3, Jupiter, FL 33411. I tried to QSL 100 cards at K16/BV but have few cards left..."..."..."VK2P/KUSU, a new card in his area, promises to answer all QSLs from VK2P/KUSU when he

Hock of 9M2FR likes 20 and 40, and we rather like his prefabricated do-it-yourself metalwork console. A change of QTH may keep 9M2FR inactive for a spell. (Photo via V3XKQ)

100-per-cent QSL policy but lost some confirmation records by fire. Hopefully if your dye pasteboard never arrived..."

Oceania - KUSUH, who operated K16/BV early last year, ponts: 'I recently worked K16/BV for the first time since logging, K16/BV, now operator Dvek, was active as W2C2P/KUSU, now can be reached at U. S. address: R.C. Nelson, USCG Loran Stn, C-3, Jupiter, FL 33411. I tried to QSL 100 cards at K16/BV but have few cards left..."..."..."VK2P/KUSU, a new card in his area, promises to answer all QSLs from VK2P/KUSU when he

Hock of 9M2FR likes 20 and 40, and we rather like his prefabricated do-it-yourself metalwork console. A change of QTH may keep 9M2FR inactive for a spell. (Photo via V3XKQ)
ZSSX returns to his dial after some years QRT and finds himself quite popular with a DX-100B, NC-303 and TA-33 twirler. John intends to add single-sideband facilities. (Photo by W1DGD)

F7GC, Lt. Col. J. V. Fill, Sig. Div. USAF, HQ SHAPE, PO Box 50, New York, N. Y.
F9BAP, M. Gigan, Chef de Centre des PTT, Dounoudzi, Comoro Islands
F9F2s through A11 (see text preceding)
F8TAD,ButtonTitlesch, 10 rue de la Navigation Républicue, ex-FF8s BC, KG 8G (see text preceding)
F8FRC, P.O. Box 1002, Dakar, Senegal
H6A, W6PK & G0, (Mitch) (via KH1VF, Swami Radio Club)
H6PIJG, P.O. Box 3023, Panama, R.P.
JAZK, H. Nosu, Box 827, Osaka, Japan
K4ASK, KP4, O. Diamante, c/o Naval Radio Sta., Sabana Seca, Puerto Rico
K6COV/K56, P. Hodges, Airport Project, Panza Pano, Sumatra
K7TKN/V02, J. Cargnelli, 212 Park Dr., Steving, Ill.
K8DPA, On board USS Navy 103, PO Box, New York, N. Y.
K6OAXA/V02 (to K6OAXA)
K116/DJ1K6, L. Hoops, Box 98, Wake Island
K1NJK, C.C. Lorrain, Johnston, APO 106, San Francisco, Calif. (see text preceding)
ex-K116BK, K7KL6, 10 kw Stn., Las Vegas, Nev.
K9DPAO/2K6 (via NA1BB)
L1DRA (via KPH1AP)
LUZL, J. Luison, Calle Dobre 186, Buenos Aires, Argentina
MP4RZC, A. Everest, 87th Inf. Unit, RAF, Belmavia, BPFO 83
ex-OE1KR, H. Putrich, WA2KMY, RD 3, Baldwinville, N. Y.
O05X, Gaudyijka, Belinz Conze
OBRK (via UB4 or to ON4KR)
PA6OU, L.v.d. Nader, Boxmeerstraat 15, Nieuweveek a.d. Lisse, Netherlands
P1XUT, P.O. Box 907, Sorocaba, Aruba, N.A.
SWIVT, Crest (see text preceding)
T2A2R, Box 144, Ankara, Turkey
TAA1GI (via VE7ZM)
TPEVY, 606th AW, Squix, APO 81, New York, N. Y.
UA3FG, P.O. Box 570, Moscow, U.S.S.R.
UAIKOB, 1026AF Radio Club, U1, Tarnowskii 11, Lublin, U.S.S.R.
UR5WF, V. N. Goumertrou, Box 41, Lvov, Ukrainian SSR.
UQ2AB, P. Brasilia, P.O. Box 129, Rua, Latvian S.S.R.
VK8AB (via VK3APY)
VK7PM (via VK1OPQ)
ex-VP2KCH (via W2C7N)
VP2LS (via W300W)
VP2NI (via K9NOO)
VP4TF, C. Games, 8 Rosadino St., Woodbrook, Port of Spain, Trinidad
VP8AB (via W2A3Y); see text preceding
VP7DZ, H. Champion, P.A. Box 241, Naiapo, Bahamas
VP7NT, A. Lawrie (W2DKS), P.A. Box15, San Salvador A.A.P., via Patrick AFB, Fla.
VP9BE (via R5GB)
VP8CC (via GJ4AF)
VP9EH, N. Loewart, c/o Aerolita, Nadi Airport, Fiji Islands
VR2DT, A. Waters, c/o Aerolita, Nadi Airport, Fiji Islands
ex-VQ3A (via VK3GM)
VR3Z (via R5GB)
VSIKQ, 14 Jalan Sappan Way, Singapore 20
V51KM (via W5ERG)

VS4 4JT 6AZ, via W. Knight, K6GMA, 13811 McMains St., Carson Grove, Calif.
VS5GS, SOAS College, Brunei Town, Brunei
ex-VS5A1J, J. Lovestock, 33 Graham Av., Te Atatu, Auckland, New Zealand
VS9APS, Block 228/1, RAFF, Steamboat Pt., Eden, BPFO 08
VS9ARF (via VS9AZ)
VU2AG (via G8VD)
VU2SS (via VU2PSI)
W2ZEPZ/2K6L (see text preceding)
W6YHIN/K1H, J. Houthak, Box 8006, Honolulu, Hawaii
X2E2D, P.O. Box 297, Olazdon, Somora, Mexico
YAIBW (via DL6AX)
YV3CD, A. Ahmad, Box 199, Barbados, Venezuela
YV4AS, Victor Pie, Puerto Cabollo Airport, Venezuela
Z3IALP, A. Poletini, 78 Victoria Av., Miasia, Malta
Z0Q1 (via R5GB)
ex-Z1DGM (via Z1D2CP)
ZDRO, Box 34, Pretoria, S. Africa
ZM1AA, Field Station, Western Samoa
ZP2BB, c/o USAF Mission, U.S. Embassy, Asuncion, Paraguay
ZS1XW 6WS, via W1DGD
ZS7R, Box 98, Dalabane, Swaziland
AZ1ZZ (to ON4QK)
AZ7WP (see text preceding)
SA6QV, RAF Stn., El Adem, Libya, BPFO 56
ex-SATZT, 54C S. Harrison, c/o MARS W1RUA, Fl.
9O1MGT (via MAHTS)

The forthcoming Who's Where comes through the generous praisers of W1AJX/W RUP 0 WPO, K6AHD JTL

Whence:
Africa — DX developments are at fever pitch on the once Dark Continent. Still obscured by clouds of journalistic confusion are the Republic of Mauritania (F77), Ivory Coast Republic (F44), Republic of Mali (apparently French Sudan plus Senegal), autonomies of Chad, Central Africa, Congo and Gabon, plus other possibilities involving the regions of High Volta, French Nigeria and Dahomey. F77

May 1960
CAUTION

Under this country's treaty obligations and on foreign news received from other nations, FCC-licensed amateurs are warned against engaging in any communications with stations in the countries listed below. This is in accordance with FCC Public Notice of December 21, 1950 (p. 23, Feb., 1951 (NQT), and as since revised.

Cambodia (Xi), Indonesia (PK, YR-VID), Iran (EP-EQ), and Vietnam (X, 3IF).

For those whose QST files do not go back to 1950 we will gladly supply, upon request, literature describing the circumstances of this prohibition.

AB AG and FYAB are spearheading on-the-air activity from this scene of historic geopolitical flux, and 7G1A already has calls in the Republic of Guinea as a solid DX entity. Also, Vietnamese and Cambodian concerns remain valid and could result in new QSOs. 

Oceania — "1406WZ is on 14060 G2 again early this morning on 20 and 15, 40 and 10. He is working the world."

9G8Zs, 14G8WZ, 14G8XZ, 14G8AV, 14G8Y, and 14G8J are on the air regularly.

A4DX, W9NF, and W9MS are on the air regularly.

AF Group and the members of the DX Group have been working hard to establish new QSOs.

AG7A is on the air regularly.

AZ9A is on the air regularly.

B6Z4S is on the air regularly.

CA2AR and CA2AT are working hard to establish new QSOs.

CA2AF and CA2AG are working hard to establish new QSOs.

CA2AI and CA2AJ are working hard to establish new QSOs.

CA2AK and CA2AL are working hard to establish new QSOs.

CA2AM and CA2AN are working hard to establish new QSOs.

CA2AO and CA2AP are working hard to establish new QSOs.

CA2AR and CA2AT are working hard to establish new QSOs.

CA2AF and CA2AG are working hard to establish new QSOs.

CA2AI and CA2AJ are working hard to establish new QSOs.

CA2AK and CA2AL are working hard to establish new QSOs.

CA2AM and CA2AN are working hard to establish new QSOs.

CA2AO and CA2AP are working hard to establish new QSOs.

CA2AR and CA2AT are working hard to establish new QSOs.

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CA2AI and CA2AJ are working hard to establish new QSOs.

CA2AK and CA2AL are working hard to establish new QSOs.

CA2AM and CA2AN are working hard to establish new QSOs.

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CA2AM and CA2AN are working hard to establish new QSOs.

CA2AO and CA2AP are working hard to establish new QSOs.

CA2AR and CA2AT are working hard to establish new QSOs.

CA2AF and CA2AG are working hard to establish new QSOs.

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CA2AI and CA2AJ are working hard to establish new QSOs.

CA2AK and CA2AL are working hard to establish new QSOs.

CA2AM and CA2AN are working hard to establish new QSOs.

CA2AO and CA2AP are working hard to establish new QSOs.
Home-Built Stations

Photos of home-built stations continue to come in, an indication that the pioneering spirit in ham radio is not entirely dead. One of the past year's most interesting trends has been the number of receiver articles submitted to QST. Keep the photos coming, gang. We'll print them as space permits.

Above at the left is the station of K3GJQ. The transmitter is the 90-watt job originally described by W1IKE in QST for May, 1955, while the receiver is the now-famous HBR-14. Both the modulator and the v.f.o. also come from QST and the Handbook. Included in the station equipment is a conetrad monitor and the Little Oskey keying monitor.

Above at the right is the complete station (sans antennas) of W6STA, whom many of you will recognize as a QST author. His tuner and converters were described in the July, 1958, issue of QST. His i.f. strip is patterned after W1DX's description in January, 1957, QST. The sideband transmitter was described by W6TEU in June, 1958, QST.

The two photos below are close-ups of the gear built by K6AOV, who is another one of the ardent champions of home-built stations. At the left is another HBR-14. Incidentally, K6AOV volunteers to help anyone who runs into problems with the HBR receivers, inasmuch as he's had quite a bit of experience with them. At the right is his version of the popular 813 rig that was originally described by W1JEQ back in January, 1954. This particular design has been duplicated by more QST readers than perhaps any other unit. K6AOV did a real neat job, didn't he!

May 1960
GETTING INTO THE LIMELIGHT

Did you read the editorial in February QST entitled "Bread and Butter Publicity"? We're sure you did, of course, but some of the points made are worth repeating here. As we've often said, it seems to us that there is a particular affinity between YLs and good publicity for ham radio.

The February editorial stressed that the effectiveness of local publicity is that it concerns people known and respected in the community. "A continuing series of local news items, however minor they may seem and however little the impact of any single one, before long can get across the point that neighbor amateurs are a community asset, active in the 'public interest, convenience, and necessity.'"

Here are some of the newspaper items that have brought attention to YLs in community newspapers recently. Transmitter Best Anniversary Gift (K4LVE) — Grandma Chooses a Ham (K2IYP) — City Woman, Daughter Sked Daily Chat (K2TDG) — Ham Operators from her Kitchen (KN3JGL) — Life Begins at Eighty for Woman Ham" (K4UIX) — Hams Help Flow of Mail to Local Homes (K5DAB) — Local Woman Widely Known as Ham Radio Fan (W8S1L) — Ham Operator Tells Civil Defense Role (K6KCI). These are but a very few of the type of newspaper clippings regularly received. Factual, interesting items which surely make good promotional material for our hobby.

Just consider the photos shown here this month alone. Can you see any possibilities for news?

*YL editor, QST: Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

Officers for 1960 of the GAYLARK (Gulf Area YL Amateur Radio Klub) are, left to right: Pres. Albertos Look, K5MI; Club Historian Phyllis Ribblet, W5CXM; Vice Pres. Yelive Mathias, W5DRA; Secy.-Treas. Grace Tracy, K5YTT (ex K5FMI). An energetic new club (two years old), GAYLARK hosted YL activities for the ARRL national convention in Galveston last June.

paper items? Pretty teen-age girls go home from school and chat with fellow hams the world over. Lady phone player in the Houston Symphony Orchestra recently elected an officer of a club of women radio hams in Texas (K5YTT). Five local women sparkplug plans for convention of women amateur operators from all over the world in June, Colorado professor's wife receives special national citation from the Edison Company for relaying hundreds of messages annually for the general public. Group of California women keep communications running smoothly during Olympic Winter Games at Squaw Valley. Pioneer Radio Ham Carries on at 81 — this headline has already been used for a story on W1ZR that appeared in the Boston Sunday Herald, January 4 this year. Newsworthy stories could easily be drawn from each of these photographs.

Avail yourself of the aids the League has specifically designed to help you generate local publicity. A copy of "Getting Newspaper Publicity for Your Club and Amateur Radio" is yours for the asking. Check the February editorial again for other League aids covering radio and television interviews that are available and refer back to this column for March 1955 with specific suggestions for promoting radio and TV shows. YL clubs especially are urged to consider engaging as a group in this latter type of project.

Whatever you may choose to do, and we hope you are inspired to immediate action, good publicity to you for amateur radio!

OPERATION SQUAW VALLEY

Several members of the amateur communications team at the Eighth Olympic Winter Games at Squaw Valley, California, were YLs. The following report, based on information received from Esther Given, W6RDE, and Gladys Eastman, W6OXI, and Mrs. Wally Buckler, centers mainly on YL participation in the operation.

The Olympics communications group included, ex-W6DMC, Marion V. Long, Director of Communications; OM hams Max Kapelowitz, K6HMS, Sixth Army Technical Advisor; L. R. Ladue, W6EQ; Vic Tucker, K6SA; Fred Landesler, W6QPL; Wally Buckler, W6GHC; Ken O’Dorf, K6RHD; Carey Magnuson, W6WXX; John Holme, W6J3I; Alice Roussou, W6UN; Renee Baker, W6YRK; and YLs Esther Given, W6RDE; Gladys Eastman, W6OXI (President of the YLS); Pat Graff, K6HOI; Joyce Harrington, K6GHC; and Frances Tucker, K6SBL.

These operators handled nets of ski patrolmen, snow vehicles, personnel taxi service and communications relay stations, and in addition, they operated amateur station KUSA in their off-shift hours.

KUSA was unable to operate during daytime hours since KCBS TV headquarters was right outside the window of the communications center, and the rigs were not sufficiently TVI proofed. This factor confined operation at KUSA to the hours of 5:00 a.m. to 6:00 p.m., but transportation for operating personnel during these hours was not of the best.
Hard at work for months on elaborate plans for the YLRL convention in June at Cambridge, Mass., have been committee members (l. to r.) Helen Harris, W1HOY; Edith McCracken, K1EKO; Blanche Randles, K1ZT; Chata Swenson, W1RLQ; and Onie Woodward, W1ZEN (seated). Millie Doremus, W1SVN, co-chairman with W1ZEN, was not on hand when photo was taken. (Photo by K1HTK)

Emilie Schier, K3GJE, and her dad, K3GJH, operate s.s.b. on 20 and 15 meters from the Veterans Hospital at Ft. Howard, Maryland. A DXCC certificate is 15 year-old Emilie’s immediate ham goal.

"Really rare and active" is W9BRD's own pronunciation on this ham family, of the Folklands. The two youngest YLs have yet to get their tickets, but Mom is VP8BR, Dad CX2AM, and oldest daughter VP8BQ, VP8BR and CX2AM operate 10 thru 80 meters. Myriam, very popular on 15, is gunning for DXCC. (Photo via CX2AM and W9BRD)

Work all members of the Ryden family of Birmingham, Michigan, and you'll receive their personal certificate. Favorite band with the four Rydens is 21 Mc. c.w. In the photo, left to right: Sally, KBONW; Mary, KBONY; Alicia, KN8BRB; and Ken, KN8QOD. (photo via DU7SV and W9BRD)

May 1960
In conjunction with the 1950 Edison Radio Amateur Award a special citation was issued to Irene H. Craft, WØKQD, for her emergency and traffic organization achievements.

The amateur record that stands behind this citation is extensive. A resume of this record follows. It is not always possible to delve into a ham career in such detail, but occasionally it may be interesting to elaborate on how intensive one YL’s amateur activities can be.

Irene H. Craft, WØKQD, Alamosa, Colorado

General license: June 1933.

Equipment: B & W 5IK00 transmitter, NC-300 receiver, Matchbox 157 ft. dipole with 67 ft. open wire feeders; Airborne CM-1 Condrel monitor, VHFplex Original bug, Astatic microphone, Johnson Signal Sonty and Alcoramatic.

Code speed: 25 w.p.m. Code Proficiency Certificate — can copy 30-35 w.p.m.

Operating time: Divided about equally between phone and c.w.

Appointments: ORS, RM, Colorado four years; EC, San Luis Valley six years and currently; CD RO, San Luis Valley five years; Trustee Sky Hi Radio Club; Transcontinental Corps Director for Pacific Area of NTS two years; ORS.

Activities: Member Colorado Emergency Phone Net for two years; Member Colorado Hi Noon Net manager and a.m. manager, active five years and currently; Manager Colorado Slow Speed Net one year; active in Transcontinental Corps five years and currently; active in Pacific Area six years and currently; active in Twelfth Regional Net since its beginning (and currently) and in Rocky Mountain Net which preceded it; active in Colorado C.W. Net since its beginning and currently; member Pacific Area Staff; Secretary Sky Hi Radio Club two years.

She has accumulated about 36,000 traffic points through handling third party messages — has spoken via amateur radio to public school classes, girl scouts, etc., has given programs for women’s clubs with radio demonstrations — has given code tests to 35 people taking exams for amateur licenses; has taught code at Adams State College.

Awards: Public Service Award for work during flood of Purgatoire River in Colorado; A-1 Operator; Brann Pounds League Medallion (first in Colorado); 24 BPL certificates earned at home station and 8 at WB6TC/ Sky Hi RC station; Award of Merit for Public Service (issued by Colorado SCM); FCC; numerous net certificates; Edison citation.

WØKQD has a twelve-year-old daughter. Her OMI, Chairman of the Division of Science and Mathematics at Adams State College is NOT a ham. Irene says it was his idea originally that she should get a ham license, but that he didn’t quite know what he was starting!

84 YEARS YOUNG

It is with special pleasure that this photograph of Edith Rotch, W1ZR, of Boston, Mass., is printed, for surely Miss Rotch is a remarkable lady.

Now 84 years young, Edith is the earliest licensed YL who is still active on the air. In 1917 she received a commercial first grade license, and in 1919 she was issued the amateur call 1RO. 8NH, Emma Candler, probably the first licensed YL began operating in Jan. 1915 and Winifred Bow, TPG, was known as a ham operator before World War I. A member of the “Greater Boston Spark Club” Edith had a rig on 200 meters and an “umbrella” antenna on the roof. In 1926 she became 1ZR. During World War I Edith served as a junior inspector in the Signal Corps and during the same period was also code instructor and examining officer at the U. S. Radio School in Boston. Then for nearly twenty years she was an operator with the Postal Telegraph Company, During World War II Edith worked with the Bureau of Standards as a monitor, and later she was one of the first to become a member of MARS.

W1ZR, Edith E. Rotch, in her QTH.

QST for
Now residing in an apartment in Brookline (suburb of Boston) with "no chance for a transmitter," Edith continues to monitor MARX nets. During the summer months she is active on the air from her beach home at Nokomis, Mass.

A woman of many interests, Edith is a former tennis and ice skating champion. In 1909 and 1910 with partner Hazel Hotchkiss Wightman she won the national ladies doubles championships. She is still a member of the famed Boston Skating Club.

Her turn, illustrious career is an inspiration.

CAMBRIDGE BOUND
JUNE 1960
June 17-19, 1960

For full particulars on registration, reservations, program, etc., for the Third International Convention of the Young Ladies Radio League to be held in Cambridge, Mass., June 17-19, 1960, please see last month's column.

Indications are that there will be an impressive number of YLs converging from all over the country for the year's big YL event. Time is growing short — get your reservations in now.

For the benefit of YLs coming from Chicago, westward, KG0QR brings attention to the fact that the New York Central train No. 38 leaves Chicago at 2:40 a.m. Thursday and arrives in Boston at 10:30 a.m. Friday. If thirty or more YLs can make a group reservation, a private car will be available. All interested please contact KG0QR, Hazel Cain, De Witt, Illinois, immediately.

Chances on the unique YL certificate being awarded are still available — again please see last month's column.

If your OM would like a personal introduction to a few hundred YLs (and you would like him to have same), bring him along too. The program committee will see to it that he is well entertained.

Coming Get-Togethers and Events

New England Division ARRL Convention — May 1, New Ocean House, Swampscott, Mass. The Women Radio Operators of New England will conduct a YL meeting. Ladies' prize is a pink stole.

WINOB Annual Spring Luncheon — May 14 at Robin- hood's Ten Aces, Route 20, Wayland, Mass. All YLs in New England cordially invited. Plans for YLRL convention in June will be discussed. Luncheon is $2.50 — contact Marie Walsh, WICO, 1228 Cambridge St., Cambridge 30, Mass.

Midwest YL Convention — The tenth annual will be held in Indianapolis, Ind., May 20-21, at the Mobile Motel Manor, 5855 E. Washington Street. Registration before May 1 is $2.00. Hoosier Amateur Woman's Klub is hostess. WDBTH, Adam Elliott, is chairman; K9LXD, "Buck" Singer, is co-chairman. OMs invited.


1960 AW7AR — The 14th annual air derby of women pilots will start at Torrance, Calif., July 9 and will terminate at Canadian Bound.

Sixteen year-old Carol Plutzke, WV2GK, of Albany, N.Y., is a popular YL on 3747 kc. afternoons and evenings. Using an S-38E receiver and running 75 watts from her Globe Chief 90 into an 80 meter longwire, Carol's particular pleasure is a good game of chess on the air. (Photo via K2YTD)

July 13 at Wilmington, Del., Carolyn Currens, W3GTO, chairman of AWTAR radio net, invites YL participation in the net. (See March column.)

Note, please: If you wish a YL get-together or event listed in our "coming calendar," pertinent information must be received at least two months prior to the date of the event.

Teen-age YL Net?

Sixteen year-old Marilyn Owin, W8WUB, would like to hear from teen-age YLs interested in starting a teen-age YL net. W8WUB, whose address is 106 S. 11th Ave., Huntington, W. Va., suggests 20 meters, but other bands can be considered.

Dark Eyed Queen's Certificate

The Chicago YLRL Inc. will announce a new award, The Dark Eyed Queen's Certificate will be given to any amateur who contacts five licensed members of the Chicago YLRL Inc. Club after and including January 1st, 1960. (Net contacts excluded.) Send five QSLs showing time, date, A1 or A3, call and band, along with ten cents, to custodian Lillian Rozelle, 3638 Ruby St., Franklin Park, Illinois. Current club members are W9QME, K9s CMZ, CQF GUR, JEH, JVL, LIW, LYG, OSS, PDS, and UIID.

May 1960
CONDUCTED BY EDWARD P. TILTON, WIHDQ

With the advent of spring and the approach of another v.h.f. DX season, the number of hours devoted to operating on 6 and 2 is bound to rise for most of us. This is going to mean a lot of fun, a chance to boost our states totals — and, in not a few instances, more TVI. Even if your station is capable of getting into a lot of TV sets, you may not encounter much neighbor trouble, so long as you operate only at widely-spaced intervals and for short periods. But when the operating pace picks up, so does the public response.

Of all the questions of a v.h.f. nature answered by the ARRL Technical Information Service, a considerable portion have to do with TVI. Some of these plaintive appeals for help show that the amateur in question has not the foggiest notion of what causes the TVI, or what to do about it. Too often he just lets the situation deteriorate, doing nothing to correct it, or to help his neighbors. When this happens, things are bound to explode eventually — and being able to prove that his transmitter is "clean" will be no solution to the mess he is in by then.

It may be true that the transmitter is not at fault, but nothing is gained by jumping up and down and declaring this fact in angry terms. For some years now, TVI (all kinds) has been far more a public relations problem than a technical one. We know that TVI can be cured, and that oftentimes the cure must be applied at the receiver end. But your neighbor doesn’t know it, and you will get nowhere in convincing him, unless you are willing to lean over backward in the matter of neighborly cooperation.

Rule 1: Don’t let TVI drag on. If you know that you have it, get to work. You have to convince the TV owner that you are at least as interested as he is in clearing up the trouble. You can’t just pawn the job off on some TV serviceman.

Rule 2: Never lose your temper. Once you and your neighbor start shouting at each other you’re done for. No matter how angry he gets, you must keep cool. Better yet, keep friendly.

Rule 3: Learn the causes and cures of TVI. Be sure that you know what is actually causing the trouble, and that you know how to fix it. If you just got your ticket yesterday this may not be easy — but if you don’t know how to do the job, nobody else is going to do it for you. The set owner and the TV serviceman will almost certainly be of no help. The initiative and the know-how must come from you.

We are not advising you to take on the work of fixing all the TV sets in the neighborhood, but you can install a stub or a filter, to show where the trouble lies. If you don’t want to see much as look at a neighbor’s receiver, take one of your own along. Portables compact enough to be carried around for this purpose are everywhere today. There is nothing like a demonstration of the cure to convince a doubting neighbor.

There are many forms of v.h.f. TVI, but probably 90 per cent lies in one or more of the following categories:

Overloading — This is the source of most 50-Mc TVI, and the receiver is the culprit. It is a certainty on Channel 2, at close range, and is common on all low channels. It may show as modulation bars, with no carrier interference, or the picture may be messed up whenever the carrier is on the air. The cure is quarter-wave open stub or high-pass filter on the receiver. Where the picture is clear until the 50-Mc rig is modulated, going to f.m. or c.w. will usually take care of the trouble. Reducing transmitter power and raising the antenna are often helpful.

Image Response — Another Channel 2 problem, but for 2-meter men. Common in TV sets with high-frequency i.f. system, which means most recent production. A stub or a tuned trap on the receiver is usually effective. Not so widespread as the overloading cited above, but likely to be troublesome in congested weak-signal areas.

Audio — Where voice interference not due to the above causes appears, it is usually due to direct pickup by receiver audio circuits. Independent of channel, it is usually heard regardless of the receiver audio gain setting. It occurs in all kinds of audio amplifiers, and embarrassing effects develop with hearing aids and p.a. systems. Cure: Keep the modulated r.f. out of the audio circuits. See any ARRL Handbook. Use of f.m. or c.w. is a sure cure: this is purely an a.m. problem.

There is not room here to go into these and other TVI problems of the v.h.f. operator in full detail. The whole story has been told in QST many times (see bibliography) and the basic information is in all modern editions of the ARRL Handbook. Digesting it is not a task for some afternoon when you have ten minutes to spare. TVI is not that simple, and neither is amateur radio. The fellow who feels that he is qualified to make his own way in the world above 50 Mc. once he has learned which way to throw the send-receive switch on a Communicator is only kidding himself, and inviting trouble. Hamming is a technical hobby.

Here are some QST and Handbook references to get you started. The rest is up to you.

Specific techniques discussed in Chapter 23.

TVI Hints for the V.H.F. Man — April, 1953, QST.** Much of this information is also in the Handbook in condensed form.

50-Mc. TVI — Its Causes and Cures — A must article for the 6-meter operator, by W2IDZ — June and July, 1954, QST.

Antenna Couplers for 50 and 144 Mc. — July, 1956, QST.** Similar information in Handbook, Chapter 17.

V.H.F. TVI Hints — May, 1959, QST, p. 79.**

The above are just some of the articles dealing with the v.h.f. aspects of the TVI situation. Much of v.h.f. TVI follows theory and practice common on lower frequencies, and the scores of QST articles dealing with lower bands can be read with profit by the v.h.f. man.

Here and There

The night of March 15 brought one of the most widespread aurora openings on record. Signals were very strong on 50 and 144 Mc. throughout the early evening hours, and indications are that considerable work might have been possible on 220 Mc. if more fellows had been trying.

** Issues so marked are still available from ARRL Headquarters at 50 cents, post paid. Photocopies of any article can be supplied at a cost of 25 cents per page.

Seldom has anyone covered more territory on 144 Mc. during a single aurora than did W0DFB, Mishawaka, Ind., in this one. John discovered the aurora at 1820 CST. He worked W1HIU, Springfield, Va., W1JDF, Methuen, Mass., K2EJ, Oceanside, N. Y., W8WNN, Canton, Ohio, W1MNJ, Orange, Vt., W1HZY, Middleboro, Mass., W9LYA/9, W8AQ, Wadsworth, Ohio, and W6AZT, Denver, Colo., and heard W1RJA, Milford, Conn., W7JRG, Billings, Mont., and many northern stations between then and 2100 CST. This represents 1180 miles to the east, and 800 miles to the west.

This was only the second aurora that W7JRG had experienced on 144 Mc. Ken worked W8MORX, Boulder, Colo., W8AZT, W8ENC, Rapid City, S. Dak., W8YJL, Fargo, N. Dak., and heard W8DU, Watertown, S. Dak. We have no 144-Mc. reports from further west than W7JRG and W6AZT, but W7EJN, Whitefish, Mont., worked several Montana, Oregon and Washington stations on 50-Mc. v.w., between 1930 and 2300 MST. The time spread is of interest here. The peak of the aurora for the Eastern Seaboard seemed to be between 1945 and 2015 EST. Judging from the reports we have on file the peak followed sun time to the west, though there was a period around 2100 EST when auroral contacts were being made from ocean to ocean. The last DX we know of is the Winnipeg area, heard by several WIs on 50 Mc.

Through the courtesy of W1VP, your conductor had a chance to talk with Fletcher Ice Island on 20 the next day. We learned from W1JUD there that he had been at the helm of KG1FH the previous evening. Teletype stations near the 50-Mc. band edge were strong, but no amateur signals were heard. There was no lack of trying at this end on 50 Mc. Long after all but a few weak auroral signals
were gone from the 6-meter band, the die-hards were still aiming north and calling CQ at frequent intervals, but nothing came of it.

Our last report from KG1FN, at this writing, was on March 11 when the reports had been heard from far away than Anchorage, though K7AUW was working probably every night. This is a distance of some 750 miles, TV Channel 2 from Anchorage was heard quite consistently, and interference from unknown other occupants of Channel 2 was observed. The telemetry signals near the band edge, presumably the Alaskan CAA stations often heard here during high m.f. periods, are in frequent at T3, indicating that 50-Mc. DX of considerable magnitude should be expected in the north, if there were any activity in the right places. At last report it was expected that KG1FN would be off the air at the end of March.

Skeds were being kept with several K7's on 144 Mc., with some K7's working the for the north, if there were any activity in the right places. At last report it was expected that KG1FN would be off the air at the end of March.

K7690 was working the for the north, if there were any activity in the right places. At last report it was expected that KG1FN would be off the air at the end of March.

Transceotropical propagation was brisk on 50 Mc., in February, XEE1G found the band open to Argentina 9 times, and also worked HC1PS twice. PY3BGK worked 50 Mc. for about 4 years in February, LUSFZ and LUS6X worked DX almost every day, mostly to Curacao islands, Mexico and South American countries, several of our Latin American reporters heard or worked K7AEE February, and K7690 made their first appearance in several months February. It is interesting to see K6B6U on the worked list again. A new country on 6, reported by LUS6X and LUS6SDA is Martignac, represented by PM67WU and FM7YD. PZ1AE found the band open almost every day, but only once to this country. Rene worked K6EIO W4PNS and W4ATF Feb. 14.

In other parts of the world there was mixed opinion as to the state of 50-Mc. DX. The ZC4WZL-ZE2J circuit was looked up, but it is all but out of business, VK6EE and several other Western Australia operators heard Russian TV on 49.75 Mc, Feb. 21, and BE was able to make out a picture at times, G4LX reports reception of ZC2JUB K1DZT and WILGE Feb. 1 at 105-GMT. He caught ZC4WZL on Feb. 4, and 14 — probably the longest TE circuit to function in 1900.

LUS6SDA wonders why so few of the amateurs in the Caribbean area are interested in 50-Mc. work. For several months they have been absent on a considerable portion of the sunspot cycle, 6 is an almost ideal land for work over this path. Band openings are a nightly affair, and signals are strong and relatively QRM-free. Puerto Rico to Argentina contact seems to hardly be better than it is much of the time on 50 Mc.

Some of us on 6 miss out on chances for rare DX because of careless operating habits. No less a DX prize than Z8SIM has gone begging on occasion. Brannie writes that he heard US stations several times during the fall of 1950, usually around 1900 GMT, but he was not able to attract their attention. ZE2JV found the m.f.u. to New England above 50 Mc. around 1900 GMT Feb. 28, but no amateur signals were heard.

Though it will not reach most readers in time, we pass along the schedule to be kept by K2ET/GA. Bill will be working on 50 Mc. during a Caribbean cruise, and the following port calls will give us a lot of fun and where to look for him, for those readers who get this in time: Curacao May 17, La Guaira 18, Aruba 18, Kingston 19, Nassau 23, Port Everglades 24. He will not, of course, be operating while in these ports.

Anyone interested in weather schedules on 50 Mc., Z8ZIG and K12IAF have the Worcester Tech club station, W1YK, running a kilowatt on 50.004, feeding a 6-element Yagi. They are on each Sunday morning, with the beam in the WWV direction, and are interested in skeds with interested parties. Address: 329 Morgan Hall, Worcester Polytechnic Institute, Worcester, Mass. Another 50-Mc. man seeking skeds, though in this instance with stations in the extended-local area is K5BRS, Omaha, Neb.

In an effort to promote use of the upper part of the 50-Mc. band, the Greater Cleveland V.H.F. Club Net is operating on 52.2 Mc., with sessions at 2100 Mondays, K8JEE says that there are more than 50 active members so getting one of their certificates should be easy. Work six CQ'Y members and send contact data to K5IP, secretary.

Many 50-Mc. operators have learned to use the code effectively through getting into action during aurora openings. The nature of this mode of communication is such that most operators use relatively slow code speeds, so it is as good a place as any to take the big leap. The same could be true for the portion of the sun above 145 Mc. If more of us would tune there, and the Technician and Novice operators would give them a go out. During the March 15 aurora, your conductor several times called a perfectly good signal above 150 Mc. at not got takers. K1AFR reports at least two C.W. signals above 145, however, let's keep looking for them. Several recent 2-meter converters have observed that the c.w. on the low end is a lot faster than they have been accustomed to on 6144. The author of these lines is one of those that have little representation in these pages, and every so often a resident of such an area writes and asks why we ignore him and his neighbors. The answer is that this department is supposed to be a report of what is going on in the v.h.f. bands. It is made up largely from what we receive in the mails. If you want representation, you have to start the ball rolling. Wherever there is v.h.f. activity, things of interest to others are happening all the time—but you have to tell us about it. We are interested in what that the v.h.f. men in south-central Washington would like it known that they are looking for business on 6. Isolated in most directions by high mountains, they need more skeds to work out to areas of interest. LUS6X and W7JJA have worked K7BDU, Cornelius, Ore., some 150 miles away, by refraction over the Cascades. W7JJA has worked W4AID, Hillboro, Ore., about 10 miles farther, K7DKK, Olympia, 120 miles over the Cascades, comes through to Yakima, even though he is running only a Communicator III. These over-the-mountains contacts show that more work of this sort could be done with proper coordination of effort.

K2JHS, Miami, has been working portable at Lake Placid, Fla., 140 miles north of Miami, at intervals during the winter. Contact with the Miami area has always been possible, even when a halo was used. The trips will be continued at about 3-week intervals, and W2JH will have the gang keep a lookout for him on 50.25 Mc. With a 4-element beam 195 feet above sea level (high for Florida) he expects to cover the state handily. Most operation will be on weekends, between 0200 and 0400 GMT.

The availability of packaged stations has made it possible for many bedridden hams to enjoy v.h.f. work, and we have reported a number of these in the past. However, two-way work between bedridden hams may be new. W3ZIG and his clipping shows KG931F Central West Suburban Hospital, and K1AAB, confined to his bed in his Chicago home, in contact with each other on 50 Mc.

Anyone in the East who wants to try his luck in reception of ionospheric and meteor scatter on 50 Mc. should look on 5000 Mc. For W4KMY, Raytown, Mo., Jack has
sks each Saturday and Sunday morning, as follows: 0600 EST, W1HIDQ; 0600 W4HRM. At 1500 Saturdays, W1YR, Sundays the W1YK sked is at 0600 EST, and checks are made with KRE1D at 1000 and 2200 EST, Jack makes a 5-minute transmission at the start of the sked with W4HRM, and checks other e QRM contacts for 5 minutes thereafter, on 30,001. Middle Western stations are invited to follow these tests also, and to report any reception details. W6KMY would like to know how to get answers on c.w., other than on aurora. He checked his log for a recent week and found that he had called CQ on c.w. 38 times without a single answer.

Planning a trip through Northern New York or Vermont this summer? There are many fine locations in this vacation area covered for 220-Mc activity, and there is special activity on 2 and 6 to make life interesting. W3AGJ, Plattsburg, N.Y., says that there are about 40 stations in the area on 2 and a goodly number on 6. K2MEB and W2DHC are active. The following frequencies are monitored: Plattsburg—146.25 Mc, W3AGJ; Peru—145.8 Mc, K2QPV; Burlington, Vt.—146.8 Mc, W1VVS. On 6, 50.25 Mc is watched when no general tuning is being done.

Amateur scatter work on 144 Mc is no U.S. monopoly. G3IBW reports working OWE1W, Vienna, in the January Quadrants. This is believed to be the first England Austria 144-Mc QSO, and it is the 5th m.s. contact in Europe. The others: SM6BTT-BEDG, in the 1958 Gemilads, twice; SM6BTT-0E1W, in the 1959 Quadrants; and HB9SFKOK2VGC, in the 1959 Perseids. G3IBW has a high-power experimental license, so is able to run 800 watts, c.w. on 144 Mc. This feeds four 7-element Yagis in a box configuration.

220 Mc. and Up

G3IBW, quoted just above, has a 432-Mc setup, that will make Americans, with their 50-watt power limit, green. Arnold runs 600 watts c.w., (400 watts out) on 432, and has arranged for a 6-watt output but not mounted in common aperture with his 2-meter array. He reports that this arrangement has been highly satisfactory, with no evidence of interaction between the arrays.

Translates to: At G3IBW are 144,892, 434,983, and 1297,075 Mc. An input of 50 watts is run on 1297 Mc., with output of 15 watts. All bands have temperature-stabilized frequencies. Maximum range of a consistent nature on 432 Mc. seems to be about 200 miles, through DX work includes D2YBA, 490 miles, SM7- BAE, 620 miles, and SM6ANH, 616 miles. SM6ANH has been heard weekly or so several occasions, since the 88-9 first contact. He was running 75 watts input at the time.

220- and 430-Mc STANDINGS

220 Mc.

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<tr>
<th>Callsign</th>
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<th>Frequency</th>
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<td>W1HIDQ</td>
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<td>W1OQP</td>
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<td>145</td>
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<tr>
<td>W1RIZ</td>
<td>117</td>
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<tr>
<td>W1UHE</td>
<td>114</td>
<td>145</td>
</tr>
<tr>
<td>W2DQ</td>
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430 Mc.

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Strange to be quoting European power levels, and dreaming of being able to equal them here!

Should we have a standard calling frequency (or band segment) for 220-Mc work? Operators in the Los Angeles area have long used the middle of the band for serious DX attempts, because of severe CW radiation at the low end from TV receivers running on Channel 7. How about radar QRM? Does experience indicate that a frequency up in the band a way would be better than the low edge in this respect? If so, what part of the band is the best?

In the Northeast it has been customary (outside of the Boston area) to use the low edge of the band, but there would seem to be no overwhelming reason why we shouldn't move. W2SHU, Railway, N.J., poses the question in behalf of the Central New Jersey V.H.F. Society, whose

(Continued on page 196)

2-METER STANDINGS

Figures are states, U.S., call areas, and mileage to most distant station worked.

<table>
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<th>Call Area</th>
<th>Mileage</th>
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<tr>
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<td>6</td>
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The text seems to be a page from a magazine or publication, possibly a ham radio or technical journal, discussing various aspects of amateur radio, including antenna configurations, power levels, and operating conditions. The mention of specific frequencies and power outputs indicates a focus on the 220 and 430 MHz bands. The text includes questions and considerations regarding the standardization of calling frequencies and the potential benefits of using lower bands for radar QRM. The mention of specific names and call signs suggests a directory or listing of active operators in the field. The overall tone is informative and technical, typical of amateur radio publications of the era.
MOUNTING AIR-WOUND COILS

Since I did not have a cone insulator I was unable to mount an air-wound coil the accepted way. I dug into my junk box and found a collection of empty plastic boxes in which screws, bolts and ceramic capacitors came. After removing several of the box tops I sandwiched them together and fixed them to the chassis with a machine screw and bolt. Then, with model airplane glue I cemented the plastic bars on the coil to the plastic base material. The sketch in Fig. 1 shows the arrangement.

— Eugene Cope, W86DUW

HAIR CURLER HEAT SINK

The sketch in Fig. 2 shows a heat sink for protecting resistors, transistors and diodes during soldering. The device is one of those patented hair-curler gadgets. The one I have was purchased in a local 5 and 10 cent store and is made of aluminum. The fingers of the curler are hinged and spring-loaded and grasp the lead of the component to be protected.

— Edmund B. Redington, W4ZM

ANTENNA ROTATOR HINT

When you’re having trouble with commercial antenna rotators you should first check the capacitor that is usually located in the control box before climbing the antenna tower to check the rotator itself. This capacitor can cause intermittent trouble or can completely disrupt the rotator operation. It’s worthwhile checking this component first—it may save some tower climbing!

— Walter Voelker, W3PLC

CABLE TWISTER

When making up two or more wires to form a twisted cable, place the ends of the wires in the chuck of a portable electric drill. Secure the other ends to a fixed object and turn on the drill. It doesn’t take long to wind the wires. In fact it’s better to operate the drill in spurts so as not to overtors them!

— Alfred Bogdanoff, K2HHR

MODULATING THE GRID-DIP OSCILLATOR

The g.d.o. can be made more useful by adding tone modulation. The tone will help to identify the g.d.o. signal and distinguish it from any others that may be present during a test. Also, the modulated signal is useful during receiver alignment. The circuit for a neon-bulb tone modulator is shown in Fig. 3. Few parts are required and they are small enough to be tucked into spaces inside the g.d.o. case.

Switch S1 disconnects the modulator from the g.d.o. power supply. The existing switch on the g.d.o. can be removed and replaced with a multiple-contact unit in order to conserve space. Resistor R1 in the circuit is the existing grid resistor of the g.d.o. R2 is about 1/4 the value of R1. In order to change the pitch of the tone, juggle the values of C1 or R3.

— F. T. Swift, W0CMQ

Fig. 1—Sketch showing WA6DUW’s method of mounting air-wound coils.

Fig. 2—W4ZM’s hair curler heat sink
TRANSISTOR POWER SUPPLY

In transistor power supplies the most expensive component is usually the power transformer. The supply shown in Fig. 4, above, overcomes this problem by using inexpensive filament transformers. The unit will deliver about 300 volts at 120 ma continuous duty. Although designed for 12-volt d.c. input, the supply will operate from 6 volts d.c. Of course, the output will be cut in half when operation is from 6 volts.

I built my supply in a 4 × 3 × 6-inch chassis. A heat-sink channel (see Fig. 5 below), made from aluminum, is mounted atop a 4 × 6-inch cover plate which has the two transformers and resistors (supported by terminal tie points) connected underneath. The silicon diodes, input and output terminals, and the filter capacitors are all mounted inside the chassis. Layout is not critical and components can be located at will.

After wiring and checking the unit, apply power. If the supply fails to oscillate, reverse the leads at points X-X in Fig. 4.

—Robert A. Finch, K91WT

COPPER SHEET SOURCE

Copper sheeting for use in shields or low inductance v.h.f. leads can be obtained inexpensively from an arts and crafts supply store. The sheeting can be cut with scissors, shapes easily and can be soldered with a conventional soldering iron.

—Julian N. Jablin, W2QPF

TALK-IN ON FREQUENCY WITH THE GSB-100

The effectiveness of the CALIBRATE function of the Goerz GSB-100 transmitter can be improved by a very simple change in the wiring associated with the FUNCTION switch. Normally, the CALIBRATE position disables the modulator circuits so that only an unmodulated signal is available for calibration purposes. The changes described here add modulation so that relatively greater accuracy is attained in zero beating.

Wire a jumper from terminal 9 to terminal 8 or 10 on switch S12. On section S2A, remove the connections from terminals 2 and 8. Tape the ends of the removed wires and leave them in place so that the transmitter can be restored to its original circuitry it desired.

—Grant N. Nickerson, W1WJD

COLORED TAPE FOR IDENTIFICATION

Colored adhesive bandages can be cut into various sizes and shapes and used for identifying such things as cable connectors, cable ends, antennas, etc. Outlets and test-point jacks can also be identified by this method.

The bandages come in several colors—red, yellow, blue and white—and some are even marked with stars and other symbols. Conventional black plastic tape can be used to indicate ground.

—Dr. Maurice I. Sason, W2JAI

REducing THE NOISE FIGURE OF PENTODE AMPLIFIERS

Recently I ran across a method of reducing the noise figure of a pentode v.h.f. amplifier. It involves the use of feedback in the screen circuit of the tube and reduces the effect of partition noise. On a 6AK5 amplifier operating on 6 meters, I was able to reduce the noise figure about one db, by connecting a ten-turn coil, ¥ inch in diameter between the 6AK5 screen and the screen by pass capacitor. Those interested in pursuing this technique further can find information on the subject in the book Noise, by Van Der Ziel, published by Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

—Robert F. Schuetz, W2BGD

May 1960
AMATEUR GROWTH

Passing the 200,000 mark in October, the number of amateur stations licensed by the Federal Communications Commission grew to 205,000 at the end of 1959. As some amateurs have a second station license the number of individuals in the amateur service is slightly less, 200,000 at year-end. The yearly growth of the amateur body was on the order of 15,000 persons. Actually, during the year some 34,000 new licenses of all classes were issued by FCC, but two-thirds of these were Novices, many of which do not graduate to a higher grade at the end of their one-year term.

HONDURAS THIRD-PARTY TRAFFIC

Effective March 17, an exchange of notes between the governments of Honduras and the United States was concluded providing that amateurs of each country may exchange messages on behalf of third parties. The agreement contains the usual broad restrictions limiting conversations or messages to purely personal and relatively unimportant matters — except, of course, in actual emergency. The full list of countries with which U. S. amateurs may freely handle such personal unimportant traffic internationally is: Canada, Chile, Costa Rica, Cuba, Ecuador, Haiti, Honduras, Liberia, Mexico, Nicaragua, Panama, Peru and Venezuela.

STAFF NOTES

We welcome to the ARRL Hq. Ten-Year Club our newest member, Lewis G. McCoy, W1ICP, QST Technical Assistant. Actually, "Mae" completed his ten years last September, but formal recognition of his entry into the club was withheld until the League's delegation returned from the Geneva conference.

"Mae" came to the League as Assistant Communications Manager — Phone, after considerable experience as W9PITZ and WOICP in the mid-west, particularly in traffic-handling on various section phone nets. One of his extra duties at Hq. was handling TVI problems, and with his transfer to the Technical Department in 1951 many of his appearances before convention and local club groups were based on the elaborate demonstration of television interference which helped so many amateurs get "out of the woods" in our most pressing problem at that time. As every QST reader knows, he has specialized in recent years in the beginner field, helping the newcomers over rough spots by means of regular articles describing simple and economical equipment and antennas, and as part of the Technical Information Service he also inherits all of the correspondence arriving at Hq. seeking answers to problems which have newcomers stumped. An ardent DXer (242 countries), "Mae" is somewhat more interested in dils and dabs than when he first came to West Hartford, and is currently mastering the technique of a TO electronic keyer.

144 MC. ARMY USE

During the two weeks between May 7 and 21 the U. S. Army will be conducting large-scale maneuvers, under the key name "Elk Horn," near Yakima, Washington. Because many additional frequencies will be needed for the communications system supporting this operation, the Army has requested permission to use eight channels in our 144-148-Mc. band. To this proposal the FCC has offered no objection, but there is an express understanding that no interference will be caused to amateur activity.

14 MC. IN CANAL ZONE

Amateurs in the Canal Zone, who are under military rather than FCC jurisdiction, have been granted an expansion of their 14-Mc. voice band, effective April 1, up to the top limit of the band. The phone subband there is now 14,150-14,350 kc.
MINUTES OF EXECUTIVE COMMITTEE MEETING

No. 273
March 21, 1960

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the headquarters office of the League in West Hartford, Connecticut, at 11:15 A.M., March 21, 1960. Present: President E. C. (Bob) Goodwin; First Vice-President Peter C. Noble; General Manager A. L. Byrdong; Directors Milton E. Claflin, John G. Doyle, and Morton B. Kuhn; Vice-President F. E. Handy and Treasurer David H. Houghton. Assistant Secretary Perry E. Williams and, by invitation of the chain, former Communications Manager Fred Schnell, WACF, were also present.

The Committee first took up a proposed amendment to FCC rules to permit U. S. civilians overseas to apply for Conditional Class licenses regardless of the distance of their permanent home address from FCC examining points. The General Manager pointed out that civilians overseas who are fortunate enough to maintain a residence more than 75 miles from an examining point may apply for a license while those living closer are not eligible under the present language of sections 12.21 and 12.44. Upon motion of Mr. Doyle, it was unanimously VOTED that, under the provisions of Article 7 of the Articles of Association, the following resolution is submitted to the Board of Directors for mail vote:

"RESOLVED, that the General Manager is instructed to petition FCC for rulemaking to amend Section 12.21 by striking the following language: "(except to permit a alien or permanent resident, for a reasonable period, outside the jurisdiction of the Federal Communications Commission and who maintains a legal residence within the United States, its territories or possessions, without regard to the distance of such legal residence from the Commission examination points listed elsewhere in this chapter. (Note: Noting in this section may be construed as authorizing Commission licensees to operate within the jurisdiction of a foreign government except in accordance with the provisions of sections 12.20 and 12.21 of this Part) to amend section 12.44 in similar fashion."

Upon motion of Mr. Noble, it was unanimously VOTED that the Committee ratifies its mail action authorizing an additional expenditure of $545.80 to reimburse SCMs and QSL Managers for certain travel in furthering ARRL organizational activities during 1960.

Upon motion of Mr. Doyle, it was unanimously VOTED approving the holding of an ARRL Oregon State Convention at Portland, Oregon, April 30-May 1, 1960, and an ARRL West Gulf Division Convention at Dallas, Texas, June 18-19, 1960.

Upon motion of Mr. Claflin, it was unanimously VOTED approving the holding of an ARRL Southeastern Division Convention at Atlanta, Georgia, June 4-5, 1960, and an ARRL Delta Division Convention at Chattanooga, Tennessee, April 7-8, 1961.

Upon motion of Mr. Doyle, it was unanimously VOTED that the Committee ratifies its mail action affiliating the following clubs:

Eastern Pennsylvania Amateurs
Havertown, Pa.
Gloster County Amateur Radio Club
Glassboro, N. J.
Medford Amateur Radio Association
Medford, Mass.
Moses Wells Club Mobile, Texas
Montgomery Mountain Radio Club
Sevastopol, Arizona
Porterville Amateur Radio Club
Porterville, California
Propagation Unlimited
Clearwater, Florida
Radios
Lancaster, New York
South Eastern Illinois Ham Society
Elgin, Ill.
Wap掀 Radio Club
Independence, Iowa

Upon motion of Mr. Kahn, League affiliation was unanimously GRANTED to the following societies:

Acadia Amateur Radio Club
Crewley, La.
Bedgier VHF Club of Millwaukie
Millwaukie, Ore.
The Bushwick High School Amateur Radio Club
Brooklyn, N. Y.
Butler Senior High School Amateur Radio Club
Butler, Pa.

FAMILY MEMBERSHIP

For families with two or more amateurs, ARRL By-Laws provide that, after one individual has become a Full Member of the League at the regular dues rate ($5 in the U. S.), additional amateur members of that family may join the League for a special dues rate of $1, with all rights and privileges except the receipt of additional copies of QST. Our correspondence indicates some misunderstanding of this arrangement. Please note:

1) All participants in the Family Membership plan must be Full Members—i.e., holders of amateur license. Unlicensed persons do not qualify.
2) There must be an immediate family relationship—i.e., husband or wife, brother or sister, father or mother, son or daughter.
3) The rate for the initial membership is the standard $5 ($5.25 in Canada). The rate for additional amateur members of the family is $1—not $2 as many seem to believe.

All Family Memberships must be concurrent—i.e., expire in the same month.

So if you are part of a ham family, slip in an extra dollar for each other ham in your clan next time you renew your League membership.

The Calumet Amateur Radio Club
Whiting, Ind.
Edna High School Radio Club
Edna, Texas
Free State Amateur Radio Club
Fort George G. Meade, Md.
Freehold Regional High School Radio Club
Freehold, N. J.
Las Vegas High School Amateur Radio Club
Las Vegas, Nev.
Lincoln Amateur Radio Assn., Inc.
Lincoln, N. B.
Michigan Tech. Amateur Radio Club
Houghton, Mich.
Muskogee Amateur Radio Club
Muskogee, Okla.
Spring Hill Amateur Radio Society
Moline, Ill.
St. John High School Radio Club
New York, N. Y.
Twin Sauls Radio Club
Staunton, Va.
Wheaton Community High School Radio Club
Wheaton, Ill.
Spauld Pickering Amateur Radio Klub
Loring AFB, Maine

After discussion, on the motion of Mr. Kahn, it was unanimously VOTED that the affiliation of the Fordham Radio Club be terminated and its charter recalled under the terms of the rules and regulations concerning affiliated societies, because of its publication and dissemination of literature inappropriate and objectionable to amateur radio. Without action the Committee dismissed at length a number of business and administrative matters, during the course of which the committee was recessed for lunch from 12:15 to 1:57 p.m.

The President announced the appointment of Mr. Claflin as chairman of the Housing Committee and Mr. Kahn as a member of the committee. He also announced the appointment of Mr. Kahn as chairman of the Planning Committee, and Mr. Creasey a member of that committee.

There being no further business, the Committee adjourned at 4:16 p.m.

A. L. BYRDLONG
Secretary

May 1960
Antenna used at VU2ANI.

Andaman Island Expedition

BY LES KING *, VU2AK

This expedition, like others, suffered many teething troubles before it got underway. Suffice it to say that after getting through red tape in clearing the equipment loaned by Ted Henry and Ihygain, having members drop out, and having passage difficulties at the last minute, we finally made it to the Andaman Islands for 30 days.

How It Started

While tuning over the 14-Mc. band on the 22nd of September, 1959, I heard Raju (VU2NR) and Cal (YA11W) in a huddle over the proposed expedition. As I myself had tried to make it with Kab (VU2BK) in 1958, I had all the dope on the subject, and I could not help but break in on the QSO. I was immediately asked to join and expedite the formalities all round, as I was in the capital.

Unfortunately, Cal was unable to make it, and Rao (VU2RM) very readily joined. Later on we learned that he too had been wanting to make the same trip for some time past. It was indeed a case of “all’s well that ends well.” The entire expedition was air-planned not only amongst the team members, but with Bob (MP1BCC) back to W’land with Walter (W3RIS) to get all the gear through in time.

The Way Out

The difficulty for the call sign was finally sorted out, VU2ANI was allotted to me, and my own call was suspended for the duration of the expedition. We now decided to meet at Madras on December 23, 1959, and get the M.V. Nicobar to Port Blair via Car Nicobar Island. Thus for the first time the three met as a team, when Raju and Rao met me at Madras along with other hams. Raju had got earlier in to do the spade work at Madras, and so duly armed with health certificates and the other gear (32V-2) loaned by Western Zone ARSI and my own homebrew rig, we finally boarded the ship on Dec. 26 at 1430 hours. Raju has a powerful voice, but he nearly lost it in an effort to keep the porters from dropping our gear into the Bay of Bengal. We pulled out at 1600 hours sharp, and headed out to Car Nicobar.

We were soon in a huddle planning the QTH and working out details for the aerials, but the sea began to get rough that night. On Dec. 28 and 29 we hit real bad weather, and in the process found that along with the crew, we were the only ones who were not seasick. The meals were boring, for in the dining room only the team of VU2ANI made it daily. Because of this foul weather we lost a day and eventually made Car Nicobar in the early hours of the 31st, and spent the day there. We wondered how many hams must be looking out for us, as we were behind schedule. We left Car Nicobar, a very beautiful and picturesque coral island, at 1700 that evening. That night much planning was done.

We arose at 0500 on January 1 to notice that we were now passing the small islands south of our QTH, namely The Sisters and Rutland. By 1000 Ross Island was in view and we knew at last that just beyond this was Port Blair. We made it by 1100 and cleared the docks by noon. Raju’s work had proved effective and many friends met us and we were soon moved to our QTH.

Meals, baths, etc., were all forgotten, for straight off the gear was opened and a half-wave put up on 14 Mc. At 1400 we gave our first call and 4STBC came back to us. VU2RA was next and with one accord we at last said, “We have made it! VU2ANI is on the air.”

On The Islands

The scenic beauty of these islands must be seen to be appreciated. It is a very pretty spot indeed, with the numerous green islands, hills shrouded in white clouds, and the deep blue of the ocean encircling them. They are covered with thick equatorial forests, and some of the trees are of majestic height.

We soon marred the landscape with a 40-foot 2” pipe to take Raju’s “Andaman Octopus,” which we hauled up on Jan. 6.

Yes, fellows, see the photograph and you know the secret. On the spider which we brought in with us the cubical quad was built. It took 8 days of waiting to get the correct bamboo from the forest on another island. On this tri-band job we worked 125 countries, and 3300 QSOs. It sure performed for us.

Now back to our task. From the time we fired up, it was a case of working, calling and working. Sometimes we were called even when we had not

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*% ARSI, Box 324, New Delhi.
fired up and were just monitoring the bands. Rao’s “bug” and right hand have never worked faster and his operating procedure was superb. He shelled them as one would pease at more than a QSO a minute. Excitement was great, and it was good to hear the boys from the mainland also.

By Jan. 15, we had worked DXCC.

We were plagued for schedules, but could not bind ourselves down as conditions were very peculiar. The best that we could do for the sake of everyone was to listen in on 20, 15 and 10 and work as the bands opened up our way. Sunday mornings we kept for VU hams and home schedules after which we took time off for sight-seeing and Corby’s beach.

Conditions

The 14-Mc. band turned out to be the most reliable, while 28 was grim, and gave us only a few breaks to Europe. The 21-Mc. band gave us some very good openings towards Europe. On those evenings it was indeed a pleasure to turn the beam that way and give the boys what they had been patiently waiting for so long.

When we heard JAs working Gs in the afternoon on 10 and 15, we could not hear a squeak. Yet at 1500 IST we picked up a KL7 on 20. Schedules therefore, as previously stated, could not be laid on. VK’s/ZL’s always roared in, just as the Ws. QRMI was very rough and we tried to work as many as we could possibly pull through. We used a NC-240S and a BC-348, sometimes feeding the output from the latter into the National. Rao’s converter for 21/28 did its stuff, though its looks may have put us all off.

The Way Back

We reluctantly pulled the big switch with our last contact with W3CRK on Jan. 20, wished all our new found friends luck, and got the gear packed up well in time to catch the ship on Jan. 30 for Calcutta. The journey back was uneventful and the sea as calm as a duck pond. We reached Calcutta on the morning of Feb. 2, from where the gang broke up to hit their respective ways back home. I did 5600 miles and enjoyed every bit of it, for it was the first ever VU expedition and we certainly learned a great deal.

Conclusion

I desire to thank ARSI, Western Zone, W6UOU, W3RIS, W8PQQ, KH6OR, MP4BCC, Hygain and all those unknown who helped us with gear and support to make the expedition a great success.

I am also sorry for all the sleepless nights we must have caused to some hams, till VU2ANI was in the bug. I guess there was local QRM too from the XYL side.

Note

QSL’s are being printed by ARSI as per their latest decision, and we will QSL 100%. Please send all your cards to QSL Manager, ARSI, Box 534, New Delhi, India. Any nonreceipt may please be taken up with the undersigned % the above QTH.

Only these cards will be treated as genuine by our Society. All Societies are being informed accordingly, officially, and remember the call sign is plain VU2ANI, nothing else.

Strays

Tain’t true that a Novice can’t swing DX, says K2OWJ — he notes that W2FNP, now WA2FNP, QSO’d VK3XB on 7153 kc. last August during summer QRN. QSB and QRM. FNP was using an S38-E receiver with a 10-foot wire for an antenna and a DX-20 to a 40-meter dipole.

Fewer CQ’s and more listening was the trick, says K2OWJ.

K6QQH worked K6ERF the other day and discovered his nickname was Wyatt — of course. The formal name is Donald O’Brien.

Cy Jenkins, W8VYJ, left, has been awarded the Cosmo G. Collins Memorial Award for his services to amateur radio. W8VYJ operated nearly 1500 hours last year in contact with the South Pole, relaying messages between the men and their families. He has made the same contacts for service men in Guam, Greenland and the Marshall Islands. He devoted more than 200 hours for civil defense and is E.C. and R.O. for Washtenaw County. He is active in RACES, ARES and the Huron Valley Amateur Radio Assn. and has held his present call for 34 years. He was first licensed in 1910 as 8RF. The award was presented by Currin L. Skutt, W8FSZ.
URING the night of Monday, February 29, 1960 a severe earthquake leveled the city of Agadir, Morocco, leaving an estimated 12,000 dead and 35,000 homeless. Rescue forces of many nations rushed to the scene. As in so many other disasters, amateur radio was there with emergency communications.

By Tuesday afternoon, it was seen that a radio link was needed between the U. S. Navy base at Port Lyautey and Agadir in order to coordinate the movement of aircraft, men and supplies. A Navy CB at Port Lyautey, Chief Petty Officer Bill Wright, was asked if he could set up his amateur station, CN8GJ, aboard a plane within an hour. With the assistance of another CB, Radio Equipment Operator Walt Jones, CN8GJ, the entire station, including a 35-foot mast, was removed from Bill’s home and taken by truck to the waiting plane. Bill and Walt did some hurried packing of personal effects and were ready to go within 45 minutes after they were first notified.

At Agadir, CN8GJ was set up at the French Naval Air Station. Electric power was obtained from an emergency generator set up by the French Navy. This generator also supplied the lights for the hangars, which were being used as hospitals, and supported the equipment in the airfield control tower.

There is a well organized emergency net in Morocco, patterned after the AREC. In addition to the hams at Port Lyautey, CN8JD, CN8HQ, and CN8IP work from the U. S. Naval Communication Facility at Sidi Yahia while CN8FT covers the U. S. Air Force Liaison Office at Rabat. When the first call went out from CN8GJ at 0023 on Wednesday, CN8FY acknowledged on the emergency net’s primary frequency of 7070 ke. The first message from Agadir was a request to the U. S. Naval Air Facility, Port Lyautey, for more aircraft.

For the next 16 hours, CN8GJ and CN8FY were the only link between Agadir and Port Lyautey. Traffic involved aircraft movements, evacuation of personnel, and bringing in food, water, medical supplies, rescue equipment and rescue workers. Inquiries for the whereabouts of various individuals were handled. Fortunately, in all instances except one, it was possible to pass the word that they were safe.

The Port Lyautey end of the circuit was covered by Lieutenant Commander Dave Minton (WA2LXY) and Chief Warrant Officer John Morford (K3CFH). Dave’s wife reports that, from Tuesday morning to Friday night, he had about six and one half hours of sleep. John’s sleeping hours were about the same. At Agadir, Bill and Walt each got about four hours of interrupted sleep between Tuesday morning and Saturday morning. When asked how they managed to keep going, the reply was “Well, there was a job to be done and somebody had to stay on the rig, so we stayed with it.”

On the second day, Pete Nissen, CN8JR, a storekeeper at the U. S. Military Sea Transport Service office in Casablanca, moved a rig into Agadir with the assistance of some French amateurs. In the first two days they handled about 1600 messages pertaining to deaths and injuries. These messages were passed to Radio Morocco for broadcasting to anxious friends and relatives. Pete’s ability to speak French and Arabic was invaluable for this job.

Andre Coulon, CN8AR, at Casablanca, is the president of the Amateur Radio Club of Morocco. He took on the job of policing the band in the vicinity of 7070 ke. and warning off interfering stations. His action was of considerable help, as interference was a continual problem.

The traffic handled between Agadir and Port Lyautey was vital to the flow of supplies, aircraft, equipment and personnel which were con-

*Capt., USN, FPO New York.
contributed to the disaster effort. As some indication of the size of the task, there were 361 aircraft movements, 737 persons evacuated and 1,273,755 pounds of air cargo lifted. The Commander, U.S. Naval Activities, Port Lyautey, says that he believes amateur radio operation was one of the primary factors in the success of the rescue effort. One of the first official reports from Agadir included this statement: “We have established an amateur radio contact which provides direct communication to the scene.” A later report said: “We have reaffirmed the need in the disaster area for c.w. communication capabilities which have proved invaluable during the entire operation.”

Amateurs everywhere may take inspiration and guidance from the Agadir operations. AREC training and ham ingenuity are the type of background that prompted the radio operators in Morocco. Bill Wright CN8GJ, from St. Louis, Michigan, was converted to amateur radio at Port Lyautey two and one half years ago after being able to talk to his wife across the Atlantic Ocean. Walt Jones, K1JA, from Preston, Connecticut, became interested in amateur radio while wintering in at Little America in 1956. Dave Minton, of Forest City, Missouri, had worked c.w. from military aircraft but was finally persuaded to get his amateur ticket by Romolo Prezi, K2DU, in Lakehurst, New Jersey. Dave’s last state-side call was WA2EYW. John Morford, of Miami, Florida, has been a ham for over 20 years. His last U.S. station was K3CFH, Washington, D.C.

When the call comes for AREC or Annual Field Day participation, remember that some day when disaster strikes you may be there. Now is the time to get acquainted with the problems and learn how to cope with them as the amateurs did at Agadir.

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**Strays**

Want the dope on postage rates to all countries? Get the free pamphlet *International Mail from your postmaster, suggests KL7CVI.

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Byron C. Sharpe, W9JKIC, is collecting names of Rotarians who are amateurs. He would like QSL cards from Rotarian hams, listing calls of any other Rotarian hams they know. His QTH is 634 Vernon Ave., Glencoe, Ill.

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Our youngest ORS? K9RTI is eleven years old.

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**PERE ET FIS** — W1SON of Norwell, Mass., found his CQ answered one morning by K4DAD of Stuart, Fla. . . . DAD is only 17 while SON is 52.

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Every October for the past three years, K6AXY, a patient in St. Joseph’s Hill Infirmary at Eureka, Ill., has been counting Q5 s.s.b. and a.m. signals on the 10, 15, 20, 40 and 80 meter phone bands. He has tuned up and down the bands, at all hours of the day and night, making 3,000 signal counts. K6AXY, who hasn’t even seen an s.s.b. transmitter and is strictly an a.m. man, is convinced that s.s.b. is the coming thing in hamdom. And he’s already planning more listening and more chart-making from his hospital bed next October to prove it.

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Hundreds of California youngsters QSOd Santa Claus this last Christmas — with a little help from members of the Hayward (Calif.) Radio Club. The children chatted with Santa from KG8AG, a special station set up at the Montgomery Ward San Leandro branch store. Club members took turns operating the station and playing Santa from various home rigs. The idea came from KG8QR and KG8WY carried it to Ward’s management. W6HJW played Santa on opening night.

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Three old-timers on display. Left to right: Les Benson, W0ZB/K4HWF, a gold-plated Benwood rotary quenched gap, and Bill Woods, W4AL. This is the original Benwood rotary quenched gap, designed by the two gentlemen above.

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All one happy family—the Shanks family of Richland, Washington. They all qualified for their Novice tickets at the same time and were assigned the block of calls KN7K5E through KN7KSL. Above, left to right, KN7KSG, KN7KSI, KN7KSE, KN7KSF, and KN7KSH.
The Unfortunate Ones

BY PAUL AMIS, W7RGL

The man to feel sorry for in Amateur Radio is the Non-DXer. There is nothing that will provide a clutch to the throat, or dew to the eye as quick as to see one quietly rag-chewing on 80 meters on a cold, clear winter’s night, or relaxing in front of the TV during the DX contest. Hamming is ashes to them; there’s nothing but more time for experimenting, more money to spend on fishing, and a lot less North and South paths to sweat over.

They get so selfish and underwhelmed in their non-predatory operating that you are forced to weep for them. No clobbering each other over a couple of kc, at the low end; no bashing each other with a kw, whilst tracking some DX; and missing all the fun of developing nervous hysteria over each mail delivery.

The poor non-DXers go along on the air, discussing gardening with a ham in the next state, ridiculing s.s.b. on the 75-meter phone net, handling traffic with the station across town, and liking ham radio. It’s a pretty pathetic picture.

Every ham should chase DX. No one should be allowed to escape the wonderful experience attached to each facet in developing a DXCC. The happy memories of stalking the far-off DX that wouldn’t come back; the alert hours scanning the band for an opening, only to find out later that it went wild 15 minutes after you pulled the big switch; the QSL card for that combination of wees click plus out-of-band operation; the never-arriving QSL cards; the astonishing price of high power components; the flared nozzles of the XYL when you dive into the shack for a DX session Saturday morning; the keeping awake at work the morning after the night before when the band was hot; the rusting fishing tackle; the remoteness of TV-owning neighbors; the middle-age spread.

The real fulfillment comes as your DX stature grows like a little acorn and you become a full-fledged nut; the wonder of watching your new tri-band beam, $100 rotator, and bulk of your 80-foot tower create a graceful arc as it settles through your living room roof during a windstorm; the warm glow that filled your being when you missed attending your daughter’s wedding to chase and finally work that rare country, and the additional warmth when you discovered that this particular DX hasn’t QSLed anyone for years; that feeling of “togetherness” you experienced the time you and your wife were on opposite ends of a 300-foot length of #10 Copperweld you were uncoiling for your new “V”-Beam, and she inadvertently let go; the contemplation of the ostensible ultimate you experienced as your family extricated you from the wire by cutting the entire length into 3-foot chunks with a pair of lineman’s pliers. I pity the ham who never runs his sensitivity control past receiver noise, and who listens for W7s instead of 4X4s.

How dismally sterile is the peaceful shack without the cigar box full of IRs, the $18.00 yearly subscription to the Callbook so as to keep abreast of the vagaries of DX QTH’s, the homey essence of a combination of over-heated plate transformer insulation and re-charred cigarette butts, the row of pre-selectors, filters, boosters, broad-band amplifiers, and outboard steers needed to assure continual DX reception, (and incidentally empower each local to come through like well-placed blows to the temple), all topped off with a fine web of coax, rhombic transmission line, Twin-Lead, and bankruptcy, knitting the whole into orderly chaos.

How about that unique feeling of reward which came when you had spent two hours and thirty-four minutes stalking that AC4, outwitting the entire park, only to loose him to “OL Buddy” who moved the DX to a local phone band for a long rag-chew? Or the time you kept getting reports of distortion and “garbage-grinding” and could only get replies from the s.s.b. gang? Remember how you tore the a.m. modulator and speech amplifier into their component atoms looking for the trouble — only to finally discover a tightly snubbed-up “Granny Knot” in your mike cable?

These are the times that a DX man treasures, those poignant moments captured forever and held in the heart, together with a tie by the right eye.

Think back to the fateful evening when that DXpedition finally came back to you just before your son turned on the electric drill in the base-
ment and wiped out the entire band. What non-DXer ever shared in the stark realism of such high drama? Aren’t you a better ham for having lived so richly, so fully, and acquiring that peptic ulcer?

Can a man without the DX fever touch the strength of heroism of yourself when the “bitter half” flatly threatened to leave you if you didn’t absent yourself from the operating table immediately, concurrently with the ZD7 you’d been calling coming back to you? It takes true spirit to weigh the results, and flip the transmit switch.

The non-DXer lives in an electronic vacuum. He fills his operational hours with sociability, ease, laughter, friendliness, and money. He contributes no addition to the DX bands—which is a blessing in itself. There is a weasemeat emptiness to hamming without DX—and the non-DXer is too tranquil and unruffled to know it. You just have to look at them to see what the years have done. They look youthful, unlined, reeted, with an easy laugh and a faultless digestion. It isn’t natural. If they only knew the delights of chasing DX, they would look like the rest of us—tired and sagging, gray, deeply lined from too much hunching over hot receivers, and not enough sunshine. In other words—NORMAL!

"Dit-Dit"

BY AL BROGDON,* W4UWA/K3KMO

All I can say is you fellows at Hq. sure don’t keep the ARRL literature up to date as far as Operating Signals is concerned. I’m talking about the signal that goes “Dit-diddidit, dit-dit.”

Back when I was a Novice, this was the Novice ending signal. You want an example?

WN4UVU (after final transmission): Dit-diddidit.

WN4UWA: Dit-dit. Dit-diddidit-dit.

WN4UVU: Dit-dit.

And this ended the contact.

(For the benefit of any phone men who are still trying to figure out the dits, may I explain that this is not pure Morse code, but the rhythm to “shave and a haircut, bay rum.”)

Anyway, I was visiting a Novice buddy recently, and I saw him using this same old signal in a new and different way. I rushed back to my own shack and tuned the Novice bands—high, low and 40 meters. All the Novices were using this signal in the same way.

This is the way my buddy would use the signal. He would scan the band, just listening, with his hand poised over the J-38 knob. He would come across a station sending “dit-diddidit-dit.” Then my buddy would send “dit-dit.” If the first station didn’t respond to that, he would tune on and look for others. Eventually, he would find a station that would respond like this:

Unknown Station: Dit diddit-dit.

My Novice Buddy: Dit-dit.

Unknown Station: Dit-dit.

My Novice Buddy: Dit-diddidit.

Unknown Station: Dit-dit-diddidit-dit.

My Novice Buddy: Dit-dit-de KN4—.

Unknown Station: KN4—de KN3—B TXN FR CL, etc.

ARRL, do you see what this “dit-diddidit-dit, dit-dit” is? It’s the Novice Call. For many years, the General Class amateurs have had “CQ—the General Call.” Now the Novices have “ESE-EE—the Novice Call.” You fellows at Hq. better see that this gets included in all the literature under “Operating Signals” from now on.

These Novices may not even realize it, but they are using break-in. At the usual Novice power level (75 to 100 watts input), all that is necessary to use full break-in is either a t.r. switch, or separate receiving and transmitting antennas.

So why don’t they use their break-in capability in the standard manner? Call a short call, until they get a reply. I would call a short call anything this short or shorter:

CQ CQ CQ CQ de KN4—KN4—KN4—KN4——BK

Oh, well, it’s like the fellow told me, “Cheer up. Things could be worse.” So I cheered up, and sure enough, things got worse.

Postscript

This is addressed toward the Novices in the reading audience.

Although I may seem to have been critical of Novices, it is meant to be constructive. I am “for” Novices 100%—I don’t think the class of license should be removed from the present license structure—I don’t even think Novices should stay out of the 15-meter phone DX band. I think they should use any and all of their privileges as they desire.

However, I am again “Creeping Lidism”—to include long calls (either with or without signing), bug-pushers at 10 w.p.m. with their bugs set at 20 w.p.m. (“Name br is 606,” etc.), and people who take the same amount of time to tune a two-stage c.w. rig that is normally used to tune WRGA-TV for a color telecast.

My friends, why don’t you try short CQs with break-in operation, and see if it isn’t as good as ESE-EE.

*316 W. Fairmount Ave., State College, Pa.
Correspondence From Members

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

GENEVA POSTSCRIPTS

C I have just read with much interest the article on "The Geneva Radio Conference" published in the March edition of QST.

As you have known for a long time, the Navy has always been interested in the amateurs and in assuring that their interests in matters of radio frequency allocation are not jeopardized. The aforementioned article is an excellent rundown on the current international status of the amateur bands. The hard work of the U. S. Delegation, particularly of Mr. Huntoon and yourself, was rewarded well by the final results achieved on behalf of the amateurs. I believe about a one-week step in Geneva during the conference and know firsthand the amount of long, hard work such a conference involves. (You may recall we met at the coffee counter briefly.) Please accept my congratulations for publishing such a fine article.

Frank Virden, Rear Admiral, U. S. Navy, Director, Naval Communications, Washington, D. C.

C Reading the very complete and comprehensive report of proceedings at the Geneva Radio Conference in the March issue of QST, North American radio amateurs can realize how very fortunate, indeed, they are to have an organization as powerful, and as competent and respected, as the ARRL to represent them at such a vital world conference.

If nothing else except preparation for, and participation in, these radio conferences was done by the ARRL on behalf of its members, membership would still be a gilt edged investment. What price would any amateur willingly pay to prevent the loss of, say, 200 kilocycles out of the 80 meter band, or a slice out of "20"? It may be a keen some day, but a strong and determined delegation such as these organized by ARRL will postpone that day to the utmost. — W. J. Scoonright, VE3CB, Ontario.

MORE ON NOVICES

C . . . In answer to all the letters, both pro and con, to my previous letter which appeared in January QST. I would like to register my firm standing with K5MY who states, "we all know it is ridiculously easy . . . with absolutely no real knowledge of radio or electronics whatsoever to get a Novice license." And so it is. I firmly believe that amateur radio is for only the people who prove themselves worthy of it.

Perhaps another idea, though much less effective, would be this: let the Novice license stand as it is. The only change would be that the General would be issued for a period of, say, three years, and could not be renewed. The only possible course after this would be to try for the Amateur Extra Class license, which would last a period of five years and renewable, of course. The only difference here, I would suggest, would be that all amateurs should take a retest, both theory and c.w., every five years. I'm sure that this would surely put all amateurs on the ball and only those who have any real knowledge of radio and capable of high c.w. speeds would remain on the bands (and a good way to reduce the number on the air) . . . . — Peter V. Oldt, W4A2BMB, Croton Falls, New York.

C Let's give hearty congratulations to W4A2BMB for his fine letter regarding the elimination of Novices (January, 1960). To his noteworthy suggestions, I would like to make a few additions.

The first of these erudite proposals would be a most beneficial one: discard all drivers, education courses, thereby alleviating our crowded highway situation. The second of these sagacious bits of wisdom would be to remove elementary education. This would give us more room for our already overcrowded high schools.

I hope the President or someone of equally important stature reads this. Maybe we'll have some quick action.

E. G. Robbins, K3HTB, Newark, Delaware.

C After reading WA2BMB's letter (January QST) and the comments (March issue), I would like to offer this solution to the crowded band condition.

1. Eliminate "store bought" equipment from the bands. (This will quiet things considerably.)

2. Eliminate all calls with prefixes such as WA, KI, and K. (This solves WA2BMB's problem.)

3. Eliminate all three-letter W calls. (This takes care of me.)

4. Raise the code speed requirements to 35 wpm. (This takes care of everybody.)

5. Make reexamination required every 2 years. (This takes care of the guys who boast, "It's been so long since I took the exam I doubt if I could pass it").

6. Give the whole mess to WJFH and W6AM. (This will give us a pretty good representation on either coast for foreign ops who want to work the U. S.)

— James R. Berry, W6PYF, Booneville, Mo.

C There have been letters in QST praising, condemning, complaining, boasting, and boasting this and that, but for too many complaining about the "other guy."

The writer is not new in radio having graduated from the spark coil and crystal thru the rock crusher and the tube transmitters with reception loop modulation, experiments with carbon arc modulation, naval operation on every type of craft, deep sea operator, broadcaster, in fact thru the whole string since 1915. Now in later years after 35 in the broadcast field back to ham radio with a commercial rig at home and mobile in the ear which is getting hard use.

What is wrong with amateur radio? Nothing. The editors of QST do a fine job — the directors of ARRL do a fine job and there seems to be something for everyone. There may be things that some do not like. So what? Let them go about their favorite pastime be it contests, experimenting, building or buying or just being interested. There is something for everyone. Personally my opinion is that there is no finer bunch of men and boys than in amateur radio. For myself every contact is enjoyed, every ham is a friend, every contact is a thrill. In what other hobby is it possible to find a kindred spirit in almost every town? In what other hobby do you have a common meeting ground whether your ham is a millionaire or a bus boy, a mechanic or a doctor?

Let us all enjoy our hobby. There is room for every class. I have never met an amateur I did not like on the air or face to face. — Bert Wick, K5OSE, Devils Lake, N. D.

ADVERTISING PAYS

C Like a lot of families, ours takes a whale of a lot of magazines, but after some twenty years of reading QST, I've discovered that, in all that time, it still is the only publication I've ever received with continuing interest and enthusiasm. It is also the only magazine in my reading experience in which I read all the advertisements in every issue. I can't afford to buy very much, but when I can I surely know where it's sold, how it's made, if it works, and how much it costs.

It takes me about a month to get through an issue, so figuring twelve a year, or over a period of time it works out to a great deal of continuous entertainment, doesn't it? Thanks for the many ARRL services I've enjoyed with others for so many years. — John K. Monroe, W7ACW, Lummi Island, Washington.
CALL LETTER PLATES

Our courthouse is located in the City of Davenport which is the county seat of Scott County, Iowa. Here in the state of Iowa each of the ninety-nine county treasurers' offices is charged with the duty of registering motor vehicles within its county and issuing the license plates.

At the last session of our state legislature a law was passed permitting the manufacture and issuance of special call letter plates to be mounted on both front and rear of automobiles owned and driven by qualified amateur radio operators. To date, we have issued sixty-two sets of these special plates for our county.

Most of us certainly are aware of the many benefits during normal times which accrue to an area by having a good organization of active amateur radio operators and can readily realize the inestimable value of such an organization during periods of distress. This gives us an opportunity to compliment our organization in this district as all of the men with whom we have come in contact have been high calibre men, the type with whom it is a pleasure to do business. Amateur operator K6AGJ has been especially helpful to us as it was he who, in advance of the big rush in our auto license department in December, thoroughly explained to the operators the details of the registration law as it applies to the special license plates. As I mentioned before, while this has been our first year in handling these special registrations, everything has gone along smoothly and certainly when the opportunity presents itself I shall be pleased to thank each of these amateur radio operators personally. — Ted G. Goodwin, Scott County Treasurer, Davenport, Iowa.

OOTC

It might be of interest to some of your readers to know that the Old Timers Club, which was founded in 1947, has become increasingly active, and is eager to welcome those qualified to join.

To Article VIII of the Constitution; "Any amateur wireless operator who holds a valid amateur license, and who holds a two-way contact over his or her own transmitter and did so make such transmission with such station, whether amateur, commercial, or naval, at least forty years prior to the date of his or her application, shall be eligible for consideration for membership. Applicant need not have been continuously active in the art during the intervening years." There are at present about 200 members. Correspondence should be directed to the Secretary-Treasurer, Earl C. Williams, W2EG, Box 462, Ashbury Park, N. J.

A members' net is held on Thursday evenings, on 3940 kc., with 4000 kc., at 7:00 P.M. — Stewart Pown, W1PO, Editor, Hanover, Massachusetts.

TURN IN YOUR BADGE

After reading some recent critical accounts in QST, and especially the ones written by WA2EVE in the March issue, I feel I’ll have to straighten out some points about it. Enough is enough. First, if Mr. Rapaport knows how contests are run, he must know that A1 and A3 contests are generally held at the same time, and he can go at the other side of the band if he does not want to join the others. I always could find a quiet spot during contests for an enjoyable QSO. Next, I consider ham radio as a sport, and a sport for me means competition and group spirit, not selfish individualism. If he thinks every contest is an insane one, where is democracy if one can’t compare odds against others without being treated as ready for an asylum?

Contests are not a question of majority or minority. They are a basic need for men to show their skill and ability towards an unique and common goal. ARRL knows that, and as it’s considered as a good thing, it’s applied to ham radio as it should. I don’t think contests are in excess. They are mostly scheduled at winter time, on some school-breaks, and they don’t occupy all the frequencies. If Mr. Rapaport is so easily disgusted by contest QRM, I’m afraid he does not really know what amateur radio is, and he should exchange his brand-new rig for a good camera!

If I suggest that I’m a “hello-good-bye” fellow because of my attitude towards contests, he does not know me well. I proudly provided many a guy with a RCO certificate, and I will continue to have good and long ears with anyone wishing to do so. Besides taking my share of contests, I like to relay traffic from time to time. I learned that, to enjoy ham radio, one must respect the other fellow’s point of view and take the good of every part of our splendid hobby. — Serge Langlois, VEBAW/VEJCQ, Montreal, Quebec, Canada.

You are to be complimented on selecting red for “DX TEST” on the cover of the February issue. Had it been any other color, I’d have seen red anyway! I would point out that to many of us the weeks end are not only time we have for a few hours on the air. More and more we find all bands cluttered with the DX hounds and the hollo-good-bye combiners.

My complaint is not so much that Hq sponsors these DX contests as that little seems to have been done to see if the contests, as they are now organized, excluding non-listed minded bands, are the wish of the majority of listed amateurs. This issue should be settled in the democratic manner, a referendum! Most of those I have talked with feel the same about it as W2ADB. Why not send out a questionnaire? Meanwhile, those with any opinion on the matter, pro or con, why not write in and express your opinion? After all, they aren’t mind-readers at Hq, but they do read letters! — Greg Taggart, VE7BBY, Hamilton, B. C.

I’ve noticed in recent issues of QST some letters criticizing contest operation, and laying the blame in part at the ARRL welcome mat for not “respecting the rights of the minority” to part of the ham spectrum (W2SF, Jan.; W2ADB, Feb.; W2AEC, March). I find it awfully hard to believe that even in casual and low-keyed QRM many clear segments cannot be found during the peak contest activity. I’ve gone through many an ARRL fracas in the hotbeds of “six-band,” Los Angeles and San Francisco, and have marveled at the lack of activity (contest or otherwise) above 3550 kc., 7070 kc., 14,400 kc., and 28,100 kc., to say nothing of the v.h.f. bands and 160 meters. In the west, most contests automatically concentrate on the low end and any listing of contest sub-bands by the ARRL would be superfluous. Perhaps these hard-pressed gentlemen are referring to phone, where the spectrum is somewhat more crowded, but then if you insist on using one band and one mode of emission under all circumstances, you must expect some penalty for your lack of flexibility. It is much like using one lens and one type of film to take all pictures you can take! I think the ARRL has very intelligently and thoughtfully organized the contest calendar and I’d like to say “bully!” for the League staff — keep up the good work! — William B. Bridges, W6GEN/W6GOEB, Berkeley, Calif.

THE DX "FILEUP"

With the growing number of amateurs in the United States and the skyrocketing interest in DX, the “file-up” has become more than ever a characteristic of working foreign stations. More than ever does it require that the DX, or DX-er, be thoroughly prepared. Information and patience are two of the most important assets needed, and DX-ers must always have them ready when they are needed.

DX operators should not be considered as casual operators. They are the most important contacts a ham can have and must be treated as such.

It is also important to remember that DX contacts are not always the most important items in a contest. They should be given the same importance as any other contact.

In conclusion, DX-ers should always be courteous and friendly, and should always remember that DX is a privilege, not a right.

May 1960
AREC — A Plan, an Organization, A Way of Thinking. Tennessee SCM, W4UJO, in recently addressing all his ECs, urged each to review community plans and revise them as needed. His remarks are applicable for ECs all over the nation, especially the injunction about contacting other amateurs: “Most of all, talk AREC at every opportunity; help make AREC a real power.” W4UJO’s bulletin stresses points of preparation that all amateurs should consider for emergency communications. (1) Within the limits of abilities improve and expand station equipment . . . not so much for more power but in terms of having compact equipment, reliable under all conditions, and capable of emergency powered use. (2) The best equipment is worthless unless one through practice (and exercises) develops his skills to operate. These include (1) prudence . . . the art to be quiet, (2) know-how to prepare messages in proper form, (3) facility in right procedures, precise timing of calls, tune-up ability for least interference to others, and the faculty to work well in emergency nets, to transmit, relay, and deliver messages. But let us quote W4UJO’s stated philosophy behind his and all AREC operations.

“It has been pointed out by many persons that we have amateur radio because of the public service and emergency communications which we have and will provide. . . . As citizens we use a portion of the spectrum for our personal pleasure and recreation. . . . Our obligation to meet communication emergencies comes also from an entirely different line of thought, our obligation to our Maker and society to help our fellow man as we see and feel the need. . . . We offer our services in amateur radio in the AREC; not altogether from the selfish standpoint of preserving our hobby, but from a sincere desire to help our neighbor. Considered in this way, the obligation to prepare ourselves for emergency communications takes on a more commanding and deeper urgency.”

About the BPL and BPL Medallions. The Brass Pounders League currently takes a total of 500 messages handled, or 100 originations-plus-deliveries monthly. All amateurs working voice or c.w. (or both) are invited to participate in net and individual operations and, as they make the grade, are accorded this recognition. Some time ago we took an opinion poll regarding a change of name, but such is the strength of tradition that even in analyzing the returns from phone-only groups, a majority favored continuation “as is.”

The conditions under which BPL Traffic Medallions are issued will be repeated for the benefit of new workers in the traffic field. Reports must have been made to the proper SCM in the field organization in the first 7 days of the month following that in which the traffic was handled. Messages must have been handled on amateur frequencies and in the proper normal amateur

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A.R.R.L. ACTIVITIES CALENDAR

May 5: CP Qualifying Run — W6WP
May 19: CP Qualifying Run — WIAW
June 1: CP Qualifying Run — W6WP
June 11–12: V.H.F. QSO Party
June 17: CP Qualifying Run — WIAW
June 25–26: Field Day
Nov. 12–13, 19–20: Sweepstakes Contest

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of QST issue in which more details appear.

Apr. 30–May 1: PACC Contest (c.w.), VERON (p. 66, last month).
Apr. 30–May 1: Delaware QSO Party, Delaware ARC of Wilmington (p. 86, last month).
May 2–4: Operation Alert, OCDM (p. 99, this issue).
May 7–8: PACC Contest (phone), VERON (p. 66, last month).
May 7–8: International Telegraphic Contest, USSR Central Radio Club (p. 66, last month).
May 13–15: Nevada QSO Round-up (p. 110, this issue).
Here's one end of that efficient RTTY traffic link to Alaska ... W6NRM. Note the Model 26 and 15 page-printers. Transmitter, remotely controlled, is in the garage and runs 400 watts to an 813 finally a k.w. job (at W6CQK) can be actuated by a telephone dial system and a transistorized switching circuit.

form as shown in the Operating an Amateur Radio Station booklet. Each message counted must have been handled in a 48-hour maximum delay period. Qualification in consecutive months is not necessary, but the following points must be observed.

(1) Only individual amateurs working their own stations are eligible. Club, post-training 602 and other multi-operator stations are not eligible, nor may an amateur receive a medalion on the basis of traffic handled at a station other than his own.

(2) All traffic counting toward the medalion must be duly reported to your SCM and then recorded by him in the BPL column in QST.

(3) Each amateur may receive but one medalion, this on the third time he reports a BPL traffic total and it has appeared in QST. This means that after a third BPL one must allow a two or three month period to permit the actual work to be recorded in QST before one can receive the award.

Hints to New Netters. ARRL's current Net Directory shows some 516 nets active; many nets this year have had an influx of new reporters, giving added coverage and interest and success in operations. A few ideas on what makes things go well may not be amiss. In reporting into a net, each net member should make it a point always to be on time. This is not only a matter of morale, but also of fairness to other net members. An NCS must have as many cities or points represented in the net as possible to distribute traffic efficiently. One has to make the net "free" and excuse (QNX) the reporters where located at points for which there is no traffic in a reasonable time.

Points to avoid in net operation: (1) excessive calling; (2) too much conversation; (3) excessive speed in transmissions, voice or c.w.; (4) and sending at 15 w.p.m. with bug adjusted to make dots at 55 w.p.m. Speaking of speed, the optimum recommended speed is the maximum at which the other operator can really copy "solid."

In starting messages it is of extreme importance that the originating station secure and send a full and complete address, also to include a check that agrees with the number of words in the text, so none will be added or omitted. The text itself is of no concern to operators, but only to the sender and the addressor ... in theory anyway. Real dedicated communicators realize this but know that the "apparent importance" of a message may speed it along should it fall into the hands of inexperienced amateur operators.

Interval Timing. Most alert operators don't need any special advice to get in their one-times-one radio identification, especially if accustomed to good procedure and business-like operation. Voice operators who become sufficiently involved in their usual operating find that they run into discourses and round tables where the passage of time can admittedly get out of hand, as it can also if you have lengthy c.w. traffic or bulletin.

Remember to sign each ten minutes in long bulletins or transmissions. A sound filled hour glass good for 10 minutes can be used, but for some time there has been a 10-minute interval timer on the market to help amateur operators to get in their identifications at FCC-required intervals.

— F. E. H.

RTTY NOTES

Re RTTY traffic: During the Anchorage Alaska Air Rendezvous, the traffic originated in Alaska for the other states was fed into the National Traffic System by a highly efficient amateur RTTY link. In the February 17-24 period about 200 messages were sent (60 w.p.m.) from KL7BR (7 Mc.) and KL7AXZ (14 Mc.) to W6NRM at Redwood City, Calif. Bob Weidbrecht assured himself of clean reper[ quality under excellent to marginal conditions by arranging diversity reception. Two BC339Q's with horizontal and vertical antennas were used, and the output fed to two terminal units, a flip flop, and the printer line, Bart, W6OWP on daytime skeds took 63 direct from KL7BR; W6CQK copied 54. From W6NRM the printed tape was retransmitted (AFSK) (some by f.a.k. on 3620 kc.) to Bob Mead, K6CZ, whose regular outlets gave admirable service. For a week the KL7 traffic in and out averaged close to fifty messages a day.

Bulletin's sent by RTTY: Summarized herewith is some RTTY OBB-schedule information that may be of general interest. This is in addition to regular RTTY net-schedules which often include a bulletin period conducted by an appointed during weekly net sessions.

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Freq.</th>
<th>Call</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun....</td>
<td>1400 PST</td>
<td>7140 kc., 147.3 Mc.</td>
<td>W8MXJ</td>
</tr>
<tr>
<td>Tues...</td>
<td>2000 PST</td>
<td>7140 kc., 147.8 Mc.</td>
<td>W6AEE</td>
</tr>
<tr>
<td>Tues...</td>
<td>2015 PST</td>
<td>3620 kc., 144.3 Mc.</td>
<td>VE7RX</td>
</tr>
<tr>
<td>Tues...</td>
<td>2000 PST</td>
<td>147.7 Mc.</td>
<td>K6BPI</td>
</tr>
<tr>
<td>Wed....</td>
<td>2000 PST</td>
<td>3620 kc., 147.3 Mc.</td>
<td>W6VFC</td>
</tr>
<tr>
<td>Thurs..</td>
<td>1000 PST</td>
<td>7140 kc., 147.3 Mc.</td>
<td>W6G</td>
</tr>
<tr>
<td>Fri....</td>
<td>1810 CST</td>
<td>7140 kc.</td>
<td>W6USN</td>
</tr>
<tr>
<td>Sat....</td>
<td>1000 PST</td>
<td>26,060 kc.</td>
<td>W6CQG</td>
</tr>
<tr>
<td>Sat....</td>
<td>1400 PST</td>
<td>7140 kc., 147.3 Mc.</td>
<td>W8MXJ</td>
</tr>
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The Northern California Amateur Radioletype Society reports the availability of Model 19's in the S.F. area. The membership was 92 as of the end of the year (13 new members in the year). Current officers are W6NKP, Pres.; W6CQL, V.P.; W6VFC, Sec-y-Treas. Periodic meetings are held at the El Rancho Motel (Millbrae), TTY paper, tape, and toroids are held in quantity by the club to assist members.

SCM-appointed ARRL Bulletin Stations, several in each of ARRL's 73 sections, additional to the above and W1AW also transmit A-1 and A-3 radio bulletins of ARRL and FCC information to amateurs daily.

May 1960
Traffic Topix

Who was the individual "traffic shanty" in 1959? Foolish question! It was W3CUL, of course. Who else? Nobody even came close to Mac's 902 BPL points for the year. Georgie, W2KEB, was a second round with 497, better than second-place finisher ordinary Dickie "top dog" with considerably less than that in 1949 and moved a youngster spouting the call K4TV in third with 363—the first "K" call to make the top ten for any year.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3020 kc. 7140 kc.

In the post-war (since 1946) category, we have W3CUL so far ahead that she could retire and probably retain the same position indefinitely. Mac has amassed a grand total of 207 BPL points! Compare this with the total of old Ben, W4PL, the all-time traffic man (1946) and you will get some idea of the amount of traffic passing through W3CUL in the past ten years or so. Georgie, W2KEB, has moved up to third place. Here are the first 25 in each category:

1959 Post-War (Since 1946)

1. W3CUL (692)
2. W2KEB (407)
3. K22UW (14)
4. W3BDR (97)
5. W7BA (281)
6. W6JCG (241)
7. W8UPH (230)
8. W8QX (175)
9. W8NNZ (173)
10. W6GYH (165)
11. W6USA (163)
12. W3DO (158)
13. W4PL (155)
14. W9DYG (154)
15. W8EOT (150)
16. K1CLB (141)
17. K8LR (129)
18. K1CIF/MQI (127)
19. W7ZB (115)
20. W4SHF (105)
21. K8ONK (102)
22. W5WCP (102)
23. W5DQU (101)
24. W8KFH (99)
25. W7PGY (99)

More than One-Operator Stations

Most of the call area leaders can be ascertained from the above. Among the VEs, the leader in 1959 was VE2WT with 44 points; on the basis of his 1959 performance he is also the post-war VE leader. In the post-war VE category, the following are call area leaders although not among the first 25 in the nation: W6EMG (279); W6RSCF (371).

February net reports:

<table>
<thead>
<tr>
<th>Net</th>
<th>Sessions</th>
<th>Check-ins</th>
<th>Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Area Slow.</td>
<td>29</td>
<td>180</td>
<td>77</td>
</tr>
<tr>
<td>W6CNU, 2nd Call Area.</td>
<td>29</td>
<td>213</td>
<td>186</td>
</tr>
<tr>
<td>Mike Parke.</td>
<td>21</td>
<td>188</td>
<td>488</td>
</tr>
<tr>
<td>Early Bird Trans.</td>
<td>29</td>
<td>1377</td>
<td>937</td>
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<td>Hudson.</td>
<td>29</td>
<td>401</td>
<td>529</td>
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<tr>
<td>20 Meter SSB.</td>
<td>20</td>
<td>634</td>
<td>2596</td>
</tr>
<tr>
<td>W6CNU, First Call Area.</td>
<td>29</td>
<td>...</td>
<td>2019</td>
</tr>
</tbody>
</table>
Switch to safety is the watchword of ARRL... well how about this! A too hot transformer put the finishing touches on this rig of KSDV. The line cover "Hoo-Doop" represents the wise ole bird who "hoots it up" all night. The partially burned "Keep Smiling" sign is quite apropos and that's just what chief op Del is doing... with a new Mohawk receiver.

National Traffic System. We think you might be interested in a further report on the "taping" of traffic nets for training purposes, as mentioned in this column in QST for February of this year. The response was interesting and varied, all the way from blanket approval to trite condemnation. Under the circumstances, it's hard to arrive at a consensus, but it does appear that the plan has thus far not been previously considered. For the nonce, therefore, it is being held in abeyance. We aren't abandoning it, but merely putting it aside until we can get a chance to consider ways and means of resolving some of the objections.

The tape of NJN, IRL and EAN mentioned was tried out on some "dozes," as we mentioned. The reaction seemed to depend entirely on the nature and breed of dog. Radio clubs were bored stiff, even those with a preponderance of c.w. men in them. Groups of traffic men, on the other hand, were alertly interested, and already several such groups have requested loan of the tape or copies of it. Only one tape was received from the field as a result of our request in that direction.

Some NTSeers took a self-conscious attitude about it all; that is, they didn't like the possibility of their being taped doing something wrong and held up as a bad example. Some even threatened to quit NTSeers, others questioned the legality of the whole thing in international, federal, and state terms. One amateur thought the idea excellent but said we ought to eliminate call letters more than there's a good job for someone, and not us. Perhaps what we'll have to do is ask each amateur on the tape to waive libel and other legal rights before we can use them.

So the idea was simple enough, but in common with most simple ideas it accumulates complications as it develops. If we were addicted to wishful thinking, we could wish that netters would accept any criticism in the constructive spirit in which it is intended and, if they commit faux pas, be content to have them pointed out so that others may learn from their mistakes. Wherein lies this swipe of guilty outrage? Has the fine art of joining the laughter at one's own expense become lost in the joke for self-justification? February reports:

1. Region net representation based on one session per or less. Others are based on two or more sessions per night.

2. Section nets reporting: EM2N & EMN (Mass.); R1N (R.I.); KYIN (Ky.); TLMN (Iowa); BCBN (B.C.); SCN (S.C.); W1N & WSSN (Wyo.); QPN & GC (Conn.); QN (Ind.); QFN, Gator, Gator SNN, FPTN, TPTN, FAITN (Fla.); VN & VFN (Va.); AEWT, AEBO, AENP, Morn, AENP, AENB (Ala.); C. Tenn.; S. Dak, CW, S. Dak 75 Phone, S. Dak 40 Phone; QK8 (Kans.); T. Texas; GSN (Ga.); BUN (Utah); WYN (W.Va.); SCN (Calif.); NER (Neb.); Iowa 75 Phone; MD88 (Md.-Del.-D.C.); NJN (N.J.).

3. FCC functions reported, not counted as net sessions.

Hi hum. We're so used to hearing former records that it would be a great shock to find one not beaten, some day. The day is coming, no doubt, but it's not here yet. We showed a gain of over 1500 sessions and over 4000 messages (not "pieces of traffic") over last February, to over again top all previous records. EAN set a new "rate" record for February. And, although we can't beat the all-time average (set in 1954), we improved on last year's 14.2.

W2PHX reports that 2BN exceeded its December traffic total during February, W3UE begins his fifth year as 3RN manager, and notes that the net is improving all the time W5MIU has awarded 4RN certificates to 6N's CXY DYT R1N FX N7T VJ, K4 PIA 8QG. W5GGY is interested in an outlet for Mexico, traffic for which appears on RN5 once in a while. An RN6 certificate has been awarded to WRATF, retroactive to his February report. K9HJR forwards tabulations for the "RN Service award," showing that WORSY is top man with 1840 points. Montana non-representation is a thorn in the side of K7EN; W8DN took over management duties for a couple of weeks in February while K8KRD was off the air. Unreliability in reporting is the reason for the low number of sessions on ECN. Arizona shows signs of reviving to bring TWN representation up. W9DO is resigning as UAN manager as soon as a suitable replacement can be found. Same applies to W6PLG as PAN manager. Both are finding increased job responsibilities cutting into their NTS time.

Transcontinental Corps. The TCC-Eastern roster is filling up fast. W8BMJ is beating the bushes for qualified operator-station combinations. The D function is still the key in the ornament, coming as it does at a time inconvenient for most operators. TCC-Pacific is also improving as Director W6EDE makes efforts to keep his roster alive and up to date. Traffic handled exceeded a 64% increase over January. TCC certificates have been awarded to K5CLS/6, K0DTX, W4ATB and W6QMO, February reports:

Area Functions Traffic Traffic

Eastern . . . . . . . 102 92.2 1596 326

Pacific . . . . . . . 111 97.3 9088 1851

Area Functions Traffic

Eastern . . . . . . . 102 92.2 1596 326

Pacific . . . . . . . 111 97.3 9088 1851

Summary . . . . . . . 213 94.8 5384 2177

The TCC roster: Eastern Area (W8BMI, Dir.): W6 BMJ AW NJM OBR. K1MIMQ, K7s UTV SBX, W3WG, K4KPN, W8BPG, W9s RYG LG; Pacific Area (W6EDE, Dir.): K5s LVR YBY 11HM Y9E QIF, W9s KOT QMO ELO EC (G1D), W4ATB, W7s FMC ZB BDU, K9s TDK EDH EK C6S/6, W9s ANA XQD.

Summary . . . . . . . 213 94.8 5384 2177

May 1960 97
**HONOR ROLL**

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<tr>
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**Radiotelephone**

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**NEW MEMBERS**

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**SUPPLEMENT TO NET DIRECTORY**

The following list of nets will supplement and correct the listings on page 79, Nov. QST: page 96, Jan. QST; and page 96, March QST. Only those nets devoted to a public service purpose are listed. This brings the record up to date as of March 17, 1960. Since these additions and changes were made subsequent to the publication of the master net directory (CD-50), they may be used to amend your copy of the directory. An asterisk (*) indicates correction from one or more of the above-mentioned QST listings. The numerical sign (+) indicates that net is a part of the ARL National Traffic System.

This is the last QST net supplement before fall re-registration. All nets must be re-registered after August 1.

**U.S.-Canada Area and Continental Leaders**

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
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**ENDORSEMENTS**

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**DX CENTURY CLUB AWARDS**

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<td>W8N8U</td>
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<td>VE3IP</td>
<td>W8KXN</td>
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Capitol Area 6 Meter Net 50,250 2100 CST T
Coastal Carolina Emerg. Net 3,050 830 EST S
Craven-Oncol C. D. Net 3,050 1900 EST S
Eastern Mass. Novee Net (EMMN) 3,050 1900 EST W
Eastern Mass. 2-Meter Net 14,500 2000 EST M-F
Lower Peninsula Slow Net (LSPN) 3,717 2000 EST TThS
N. Y. S. Red Cross Net 3,635 1200 EST 1/ Sn
Northampton County Civil 29,500 1000 EST S
Defense Net (Pa.) 50,340 1400 EST T
PENWVA Net 3,985 1815 CST M-S
Post Office Net (PON) 3,985 1815 CST M-S
Pot Hole Net 3,700 1000 EST Sn
West Gulf Emergency Net 3,955 0800 CST Sn
West Phil. R. A. net 20,300 1100 EST Sn
Yolo County (Cali) 14,940 1900 PST T
Operational Area Amateur Radio Net

QST for
OPERATION ALERT, 1960
(May 2, 3, 4, 1960)

Just as we were turning in final copy for this issue, we received a letter from W8USA, OCDM RACES Coordinator, with all available information on OPAL-60. This can serve as nothing but a last-minute notice to all concerned who have not already been informed, inasmuch as state c.d. officers have probably already informed local c.d. directors, and we shall have informed our own emergency coordinators.

Naturally, we amateurs want to cooperate to the utmost in this nationwide exercise, just as OCDM and local and state c.d. organizations assisted us during the SBT last year and previous years. The OPAL-60 "standards," while devoted primarily to subjects of little interest to us communicators, has this to say about RACES: "All RACES phones should be put into effect during the exercise. All possible use should be made of RACES nets to provide an opportunity for testing and training of RACES personnel and plans."

In his letter, W8USA adds these words: "Again this year, we welcome AREC membership participation, in addition to RACES people. It is an excellent time for amateurs to volunteer their services to local authorities, whether already organized or awaiting such an opportunity for their capabilities to be officially recognized."

RACES radio officers and AREC emergency coordinators who have not already done so are urged to get lined up with their c.d. directors or communications officers to discuss their part in the coming exercise. Amateurs not taking part are requested to avoid causing unnecessary interference to RACES nets in operation during the OPAL dates.

Although FCC will conduct a CONELRAD drill during the exercise, amateurs this year are not being requested to report results. Response from amateurs in reporting CONELRAD reception last year was very gratifying. This year, only broadcast stations are required to observe the alert.

Let's have a good showing of amateur participation in Operation Alert 1960.

With the AREC

Browsing through the volume of 1959 QSTs with Annual Report data in mind, we find that during the year only one communications emergency found its way into the 8-point "up front" portion of the magazine. At first impatience, one would think that the QST reporters were off the ball last year. It certainly seems that among the 81 emergencies reported during 1959, at least half a dozen or so would be worthy of up-front treatment.

And so they were. Some of the emergencies were big ones, encompassing a wide area and extensive amateur activity. They should have received more prominent treatment in the magazine. How come they didn't?

Well, to begin with, QST, unlike other magazines, has no reporters—not as such, anyway. As the organ of a membership society, it relies principally on its membership to supply material. That means you, QSTI. But, like other magazines, QST material must be readable and presentable. We can edit it for the former, if necessary (within limits), but the type and quality of illustrative matter is something over which we have less control. If a picture is worth a thousand words, then maps, charts and diagrams are worth at least 500 each, and these all make good illustrative material. They don't have to be pretty; we'll probably do them over to fit into the copy anyway. But they do have to illustrate something or in some way be significant.

Pictures? By all means. Nobody is going to look twice at a magazine article without any pictures. We all look at the pictures and read their captions before we read the article itself; as often as not reading the article only because we were attracted by the pictures. Considering the number of amateurs who are also camera enthusiasts, it is surprising how few pictures of amateurs in action during an emergency are received. Mostly what we get are newspaper clippings or photographs of non-amateurs.

Don't misunderstand. We appreciate what you send in, and do the best we can with it. But the quintessence of a National Emergency Coordinator with a constantly-packed suitcase by his desk, ready to hop the first plane for an emergency area and coordinate it at the same time he does a magazine-reporting job, is an obsolete and impractical one. Our work begins when yours is over. When the emergency is over and you have gathered the facts of what went on and have sent them in to us, then we have the job of seeing that they are adequately reported in QST. That word "adequately" is a key word. We cannot do an adequate chronicling job unless we have adequate material with which to work. It's up to you, our reporters in the field, to see that we get it.

Some time ago, in this column (Oct. 1955 QST) we suggested the designation of an assistant EC as "AREC reporter." This could be an important job for someone of your group who is handy with the pen and with paper work in general. We still think it is a good idea, but have heard of very few AREC groups doing it; usually it is the poor, harrassed, overworked EC who not only does the promoting, organizing and routine reporting, but is expected to write up the results of emergencies and send them in to QST as well. No wonder so many of our reports are sketcty. How about some volunteers for this type of work from among you AREC members?

And you follow with cameras: when you go out on an emergency call, throw your camera in the glove compart-

During the snowstorm in Nebraska, K0SCH was on the air continuously for 12 hours, during four of which he acted as control station. Les is only 13 years old and is in the eighth grade.

May 1960

NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
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<td>General Calling</td>
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<tr>
<td>3875</td>
<td>General Calling</td>
</tr>
<tr>
<td>7100</td>
<td>General Calling</td>
</tr>
<tr>
<td>7250</td>
<td>General Calling</td>
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<tr>
<td>14,050</td>
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<tr>
<td>14,225</td>
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<tr>
<td>145,350</td>
<td>Emergency Traffic</td>
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</table>

During periods of communications emergency these channels will be monitored for expidite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.s. — 3538, 7030, 14,050; phone — 3760, 14,100, 28,200 kc.
ment, or hang it around your neck, and as time permits snap a picture or two of these amateurs in action. Can't tell, a simple snapshot taken during the heat of an emergency may achieve immortality and bring you undying fame, as did the one on the cover of Nov. 1938 QST.

Kentucky SEC W4BAZ reports that amateurs participated in the explosion at Warsaw, Ky., on Dec. 28. W4BAZ reported the incident in the Morning Kentucky Phone Net, saying that the Cincinnati Red Cross had dispatched a mobile unit to the scene and wanted a Louisville station to take in the action. W4BAZ headed to the nearest frequency of 3800 kc., contacted KBRRU/4 in Warsaw and succeeded in clearing some traffic despite low power at KBRRU/4 and the lack of cw availability.

On Jan. 10 a child was reported lost in the Warrington area just outside Pensacola, Fla. An alert was sent out on the ten meter net by W4EGW and within minutes the net was in full operation with about 15 mobile stations and several fixed stations participating. Net control station in search headquarters was K4YD/mobile on 6 and 10 meters with emergency power in a well-equipped van. Both nets were in session for about 6 hours until the child was finally located and safely returned home.

When a series of mid-January snow and ice storms knocked out communications over a wide area in Nebraska, amateurs were on the job full time, including all Nebraska nets. The Morning Phone Net began operation at 0700 on Jan. 13. The Mail Net operated the second day and operated until 1816. At that time the Post Office Net started operation and continued until conditions forced an exodus to 100 meters. This around-the-clock operation continued for nearly three days, the nets handling hundreds of emergency messages for the Post Office Department, radio and TV stations, electric companies, telephone companies, state and county road departments, Nebraska schools and other organizations, and individuals. Net controls were W7o LFJ NS1 ZOU I7TA, K8s 8VR DQW 8PD SCM. Other stations handling traffic: K8s BDF HAZ KJ7 QMV, H8s BHS QFQ OFM CDG LJW K8A SCO LPK VPX, M7o HIL, U7Q VPA, MC7o XDM, K8p KN7TW, K8o DOU EXF LEP JIN YPR E17T E6Y CVH LAY N8s NSM RS7 ZWG BOQ DIT EQG FTQ HOP KDW KTZ L7q VZ7 WGA WKP HQE ZAF. — W7hta.

On Feb. 3 the western section of Norte Scotia was hit by a snow and ice storm which disrupted power, telephone and telegraph lines between Bridgewater and Yarmouth and Bridgewater and Middleton. An emergency net was established on 75 meters focusing around Liverpool, which was snowed in. VE1TJ operated the station from his home station while power was on and from VE1US's home station when power failed, handling traffic for the telegraph company, the Canadian National Telegraph Company and the Power Commission. Contacts were maintained with Middleton, Bridgewater and Halifax throughout the emergency. Many amateurs from other parts of the province and adjoining provinces participated in the net. The unpaid civil defense net in Liverpool was in continuous use during the storm and the subsequent clean-up period. Stations participating: VE1S VN ABJ PA MA NEF EQ DW NZ ABF L7Q GX AFU W8L ADH IR QM BC ABH NE AFN MO LG LV AAR BJ, KNQET. — VE1US, EO Liverpool.

Fate and ham radio stepped in, on Feb. 19, to effect the rescue of the crew of a fishing craft run aground on a reef just outside Portland (Me.) harbor in a blinding snowstorm. Absolutely no means of communicating their plight to the mainland was available. By chance, however, the boat was spotted from the shore during a hill in the storm. The spotter happened to be KI1AX's mother, who told her son. KI1AX went on the air with an emergency CQ on the frequency of the Cumberland County Emergency Phone Net. He was answered by K1BAY/mobile, who rushed to Coast Guard headquarters with the news. After several attempts in inclement conditions, the men were rescued, little the worse for the experience. However, since communications were down in the Portland area, they may have succumbed to the elements had it not been for the alertness of shore watchmen and the prompt action of KI1AX and K1BAY. — K1LSJ.

Receiving word, on Feb. 5, that his sister-in-law in Charleston, S. C., was seriously ill, but having no means of communication, K5GJM contacted K5MMZ in Huntington, W. Va., who finally made contact with K5GJN in Springfield, S. C. The latter accepted the traffic and, after some trouble, relayed it to W4VPN who tried to deliver by land line but, failing that, drove some 20 miles to reach the family for which the message was intended. Land line contact was then established. All this just to show that the ham spirit of helpfulness still exists. — K5GJU.

The Anne Arundel County ARES and RACES group assisted, on Dec. 13, with the movement of Baltimore's Sinai Hospital to a new location without breaking the continuity of hospital services. A hand-carried unit in the upstairs hall was used to notify a fixed station in the lobby that a case was on its way down and station then notified a dispatcher on the street corner to dispatch an ambulance, designated by number, so that it would be waiting at the door when the case arrived. Progress of each ambulance was relayed by wire to the next fixed station. Two subscribers along the routes and by fixed stations at both the old and new buildings. The Anne Arundel Radio Club had 35 amateurs handling the communications end of this vast and complicated movement, which went off like clockwork. W3NAO, county EC, was in charge.

On New Year's Eve the Hennepin County (Minn.) sheriff enlisted the aid of the Mobile Amateur Radio Corps, under EC K8SCB, in patrolling the city of Minneapolis-St. Paul area. Seventeen operators participated. Minor accidents spotted by roving patrols were reported to the control station and quickly checked out by the sheriff's office. There were no major accidents. Operation continued until 0300, Jan. 1.

Amateurs in Tioga County (N. Y.) assisted c.d. radio logical teams in a simultaneous atomic alert conducted by the N-W RACES on Jan. 23rd. W2NYD did the groundwork in communications. Portable stations were set up at Owego and Waverly, two fixed stations at home locations were used as relays, and four mobiles took part. Eleven amateur operators were used.


In April QST we showed Indians as having submitted eleven reports. The SEC indignantly claims he never received a report, and the SEC only has one in file. Okay, we'll take the blame, and put Indians on the 100% list for 1959.

RACES News

An extensive RACES network exists in Lake County, Indiana, called the Northwest Indiana RACES Net, under the management of W9E61Z. The net operates on 147.3 Mc., and is composed of 45 base stations located at local broadcast stations, law enforcement offices, c.d. headquarters and hospitals in Hammond, Gary, Highland, Griffith, and East Chicago. Two fully-equipped buses are available for immediate use. Ninety mobiles and base stations from Chicago area points participate in the network. On Dec. 18 the net was alerted over the air to assist local and state police in reporting traffic violations, accidents and other incidents. Out of 576 hours between Dec. 18 and Jan. 10 the net was in session 342 hours utilizing 58 mobile stations and 15 area support stations. Thirty-three emergency calls were reported during this time, and law enforcement officials were greatly appreciative and highly gratified at the assistance rendered. — W9E61Z.

The Rock Island (Ill.) RACES group assisted in the evacuation of 100 families in the Rock River flood, Jan. 25 to Jan. 31, under the direction of RO W8DDY. The following amateurs provided communications: W9e BUB
Two mobile and two fixed stations of Chautauqua County (N. Y.) RACES operated on 2 meters from 0300 to 0700 on Jan. 29 to handle traffic in connection with the train wreck at Westfield, N. Y. Taking part were W2RJH (RO), K2LVR and WA2ARB. — K3JOQ.

On Feb. 8 the alternate Sector IC headquarters located in Lexington, Mass., was activated for a Sector IC RACES drill and test of equipment. The following local controls reported into the net: on 10 meters, Cambridge, Littleton and Bedford; on 6 meters, Arlington, Bedford, Carlisle, Concord, Lexington and Lincoln; on 2 meters, Cambridge, Concord, Lexington and Lincoln. Westford. Test results were evaluated and tabulated for future reference and remedial measures. — W1SFL, RO Sector IC, Area I.

On Jan. 31, New York C.D. Area 9 conducted an extensive RACES survey covering six counties in the general area of Rochester south to the Pennsylvania border. Purpose was to establish reliable circuits on optimum bands. Prior to the survey, studies were made of topographical maps and teams of mobiles were sent to strategic spots. Area radio officers were notified to be on the alert. Frequencies on 75, 10, 6 and 2 meters were used and tests conducted from 0745 to 1440. Six meters turned in the best performance, with ten and two meters doing all right from good locations, but 75 meters was generally poor. Skip conditions made things difficult on 10. Mobiles found that car directivity had much to do with successful operation. It also became evident that a good ground-plane antenna that can be carried by a car would be an asset, and that ability to read maps would help. Twenty-six operators participated in this survey from Monroe County under W2CTA and K2DZV.

### CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRRL Code Proficiency Certificate. The next qualifying run from W1AW will be made May 19 at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W8OUP will be transmitted May 8 at 2100 PDST on 3550 and 7120 kc.

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

Code-practice transmissions are made from W1AW each evening at 2130 EDST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To improve your fist, look up your own key and audio oscillator and attempt to send in step with W1AW.

<table>
<thead>
<tr>
<th>Date</th>
<th>Subject of Preceding Text from March QST</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2</td>
<td>Build Your Own Receiver, p. 19</td>
</tr>
<tr>
<td>May 10</td>
<td>Notes on Parametric Beams, p. 43</td>
</tr>
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<td>May 13</td>
<td>The General Radio Conference, p. 55</td>
</tr>
<tr>
<td>May 17</td>
<td>Amateur V.L.F. Observation, p. 50</td>
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<tr>
<td>May 24</td>
<td>A Poor Man's Q Multiplier, p. 56</td>
</tr>
<tr>
<td>May 31</td>
<td>Specifications ... Planet Civilizations, p. 71</td>
</tr>
</tbody>
</table>

### WIAW SUMMER SCHEDULE

(Effective April 21, 1960)

![Code Practice Transmission Schedules](image)

WIAW welcomes calls from any amateur station. Starting April 21, WIAW will listen for calls in accordance with the following time-frequency chart.

<table>
<thead>
<tr>
<th>Time (EDST)</th>
<th>Sunday</th>
<th>Monday</th>
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<th>Wednesday</th>
<th>Thursday</th>
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<td>0000-0100</td>
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</tbody>
</table>

1 Starting time is approximate. General-contact period on stated band begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 0000, on phone at 2100 and 2330.
2 Operation will be on 21075, 21330, 28080 or 29090 kc, depending on band and other conditions.
3 W1AW will listen for Novice Class Licenses on the Novice portion of this band before looking for other contacts.

May 1960 101
ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breim- er, W2ZRE—The Eastern Pennsylvania Amateur Club station call is K3KPO. The club is now a League affiliate. HAU is pres.; AHX, vice-pres.; IOB, secy.; HAS, treasurer. To date, the SCM Officers are K3PK, pres.; K3ANU, vice-pres.; K3DFR, secy.; K3BFW, treasurer. K3DBZ made his first NPL. The Temple University Amateur League has a new call of K3TPA. The club call of K3XBC. K3HXC has a new 10-meter beam with an Armstrong rotator. The Hilltop Transmitting Assn. will hold its Annual Banquet May 7 or at Red Lion club house. The Lan-
caster Radio Transmitting Society will hold its Annual Banquet May 1. For reservations write to OY, DUL and ZQG are now NC6S licensed. K3GYP is a new OMS. K3KPS, formerly of Detroit, has moved to Amherst. K3CNW received the "907" Society Award. HNK sends an invitation to join him on 100 meters. MKA, the club station of the West Philadelphia Radio Assn., has a new DX-150. DJW is attending Villanova University. K3-
NA received a new call of K3EMU. The Pennsylvania University Radio Club spent the winter vacation in Florida. NNL has a new jr. operator (No. 3). AMC erected a 10-meter antenna to meet skeds with his son NBR/G. HPZ is now a police officer in the city of Allentown. KB6FU was a Lancaster visitor and was greeted by a number of area operators. JNQ had to rebuild for the DX Test. DVB worked Arctic KL7 and Antarctic KC4 consecutively in the DX Test. Among the numerous teas in the area, the one at WJQF, at Chambersburg, was the most popular. The Carson ARC held its annual banquet at Palmerton. FCC recognition was presented to K3CJ's Class C Station. K3ABU has started a net (AREC EPA) on 3510 kc, nightly at 1000 EST. Its purpose is to keep in touch with the DXers in the area. The Bay Area (K3B) has started a net at (AREC EPA) on 3510 kc, nightly at 1000 EST. Its purpose is to keep in touch with the DXers in the area. The Bay Area (K3B) has started a net at 3708 kc, for any Schuylkill County traffic. ZH0 got lost on his trip to York. Z9I found him on 160 meters and got him back to the states. K3MO has been here a long time. K3ABU has a new 1510, K3DZB 1079, W3VY 328, HNK 235, FAF 233, AXA 252, MFW 109, K3DCB 129, W3ZLP 122, K3CIP 105, W3KE 78, JSX 72, K3TXE 96, W3RWO 94, AMR 42, K3ANU 41, W3NLL 130, K3BMU 27, W3HR 27, WHK 24, OY 19, K3GY 19, W3DJ 16, K3CR 16, W3JPB 22, AMC 8, KC4N 4, W3XAC 14, W3BS 8, BNR 3, INQ 3, K3ANU 2, BKL 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3RKE—Asst. SCM Delaware; P. H. DeCoucrelle, W3QZ, SEC. PKC, The NID Traffic Net meets on 3580 kc. Mon., Thursday and Saturday at 1000. SCM and NC6S (slow- speed) on 3000 kc. At 1405 and 2030. AT Net on 8/9 Me. daily at 2030. All times are EST. New appointments: NPE as EC for Montgomery County. MD. Division. New ECs are to W3DK and W3U. The AECS and BKL. More Polytechnic Radio Club's new officers are KB3J,
JR, pres.; JIam, vice-pres.; K3BNRI, secy.; K3DHFR, treasurer. BHK received a Public Service certificate at the Edison Award Dinner: Bill has a fully equipped equipment room ready to go at all times! K2BBQ, CDG is a new reporter and is pleased with his Viking II. CDQ finds more operating time with the new Crystal. K3ZK has a new receiver. K3WH was pleased to work Ireland on 6 meters. K3CXX finds that school headaches overshadow traffic work. The Free State ARC now has a PE-98 10-kw. and is also working for emergency work and Field Day. NNM, HBC and ENU are now busy on RTTY. AEB still finds time after business hours for DX activities. K3DFE is rebuilding a Navy GO-9 transmitter for contest work. EBS takes his 00 duties seriously. K3JEF takes part in PG County c.d. Unlike earlier years, DX activity is budding. Southern Delaware, EQK is rebuilding to 500 watts. Art reports that more Maryland mobbers should apply for call sign license plates or the State may consider their discontinuance. FJF reports that FRZ is re-
building the fund for contest work. K3DPC has moved to a new home. K3DBZ for 80-meter WAS. K3GZK keeps the M3N active. K3-
HFG likes his new OMS activity and wants more Bulle-
tin. O0 K3KOR received QSLs from the club station, K3KPM, going. KU3A keeps ops busy in Baltimore. KLA divides his time bet-	ween contest and OQ duties. K3JKF is editing the monthly jour-
na during the storm. OSF reports from Baltimore. O1X is starting Field Day plans for the Antietam Radio Assn. PAQ keeps active in the MDI Net. KNY is re-
building the final for DX work. TN again leads the sec-
tion in MJD origination. UE continues his SRN activ-
ity. K3WKM keeps Walter and K2XCS busy. K3EOX received ovations at the Edison Dinner and QCWA Ban-
quet for having been active since 1906. 2000 meters. 00 OOM work. ZNW finds that EC and OMS activities take up his time. The WAYARC meets the 3rd Sat of alternate months for an all-nite and is now using a certificate for five QSOs. Traffic: W3RE 374, JNQ 320, K3WJ 100, W3TN 120, AHQ 70, EKO 45, BK4 44, BUD 42, ZNW 41, K3DO 10, W3EWE 12, JZ 8, RNY 8, CDG 6, EFZ 4, OYX 4.

SOUTHERN JERSEY—SCM, Herbert G. Brooks, K3BG~SEC: W2YR, RMS: W2BZ, W2HDW and W2ZI. A N.J. Emeg. & Traffic Net certificate went to W2ZLO, Glassboro. Net activities for the month were as follows: 29 sessions. 618 attendance and 99 traffic. W2ZI is the net manager. K3GJU, Glassboro, has re-
ceived appointment as N3U on the AMOR/A NA Net. The Gloucester County Amateur Radio Club has granted local license to W2ZJ for DX Contest use. W2ZJ has a new qnd on 14 Me. and is DX hunt-
ing. K3BNK, Trenton, also has a new Triband and a new receiver, K3KNT. WINN reports a new DX QSOs. K3KFU has a new vfo. His DX totals are now 252/218. W2BEI, Audubon, has skeds with K3GFH, K3JTS and K3DFE continue to do fine work with all the AMORs. W3LW received a new 382 Mc. beam, K3KZL, Grace, is recruting from a recent v.f. Contest using a transceiverized transceiver. 1-watt output. K3WEGP is now using a W3ZBF. K3VBR is looking for W3ZBF. W2BEK's W3ZBF is now running 2000 watts. W2QIB made 40 contacts in the recent v.f. Contest using a transceiverized transceiver. 1-watt output. K3WEGP is now using a W3ZBF. W2BEK's W3ZBF is now running 2000 watts. W2QIB made 40 contacts in the recent v.f. Contest using a transceiverized transceiver. 1-watt output. W2QIB is now running 2000 watts.
GRAND OLD OPRY

It was right after the Single Sideband Dinner at the Statler (during the IRE Convention) that I listened to "Grand Old Opry."

The scene was our hospitality suite — a place where a fellow could get a dish of prunes or a mug of vichysoisse — but no scrambled eggs — like "Butch," KØDWC, wanted.

In one corner was Wally Watts, W4VI/2, speaker of the evening, relaxing over a "T. O." Kever. Working over another keyer was Fred, W4CF, and at still another was Ann, W2MWY.

Stacked behind them, and waiting their turn, were Mac, W2BIB; Willard, W3DQ; Roddy, W1SZ; Tim, W1KKP; Dave, W2JDR; "Profile" Dave, W2APF; and many others. Jack, W9GFI, was tuning the FPM-200 with his pool cue.

But what music! This was a small concert compared with the one run by Bill Harrison (W2AVA) downstairs, where hundreds of hams and hamadies could listen to the music and see the dots and dashes right there on the scope.

Enough about CW. This was an SSB affair, and if anybady needed any convincing he'd know right away that here is a most efficient mode of communication. Our outstanding authority on this is the self-same "Butch," KØDWC, Lieutenant General Francis Griswold, Vice Commander of SAC, where they're performing communications miracles with SSB.

The Single Sideband Dinner was a huge success with something like 900 people from all over the world. All of this was due to the splendid work of Ed Piller, W2KPG; Bill Leonard, W2SKE; Dorothy and Irv Strauber, K2MGE and K2HEA; Irv Binger, W2GMM; Mort Kahn, W2KR; and many others.

Speaking of other parts of the world, I'll be in Italy around the middle of May and expect to be working from HV1CN and other stations, using all three modes — AM, SSB and CW.

So until then...

SILENT KEY W9AIO
Amateur Radio on April first lost a real friend in the passing of Royal Higgins, W9AIO. We all will miss him.

[Signature]

W. J. Halligan W9AC for hallicrafters
"RANGER" TRANSMITTER/EXCITER
This popular, superbly engineered transmitter also serves as an RF/audio exciter for high power equipment. 75 watts CW or 65 watts phone input. Built-in VFO or crystal control—instant bandswitching 160 through 10. 6146 final amplifier. Wide range pi-network coupling system will match antenna loads from 50 to 500 ohms—tunes out large amounts of reactance. Timed sequence keying. TVI suppressed. With tubes, less crystals.
Cat. No. Amatuer Net
240-161-1 . Kit. ............... $229.50
240-161-2 . Wired and tested... $329.50

No matter what you expect from a transmitter...

"VALIANT" TRANSMITTER
Here's effective power, wide flexibility, and many unique operating features combined in a compact desk-top transmitter! 275 watts input CW and SSB (P. E. P. with auxiliary SSB exciter) and 200 watts phone. Bandswitching 160 through 10. Built-in VFO or crystal control. Final amplifier utilizes three 6146 tubes in parallel—wide range pi-network output. With tubes, less crystals.
Cat. No. Amatuer Net
240-104-1 . Kit. ............... $349.50
240-104-2 . Wired and tested... $439.50

"FIVE HUNDRED" TRANSMITTER
More than one-half kilowatt of power plus outstanding operating conveniences! 600 watts CW input ... 300 watts phone and SSB (P. E. P. with auxiliary SSB exciter)—instant bandswitching 80 through 10 meters! All exciter stages ganged to VFO tuning. High gain push-to-talk audio system. Built-in VFO or crystal control—VFO is temperature compensated, highly stable. Wide range pi-network output. Low level audio clipping—effectively TVI suppressed. With tubes, less crystals.
Cat. No. Amatuer Net
240-500-1 . Kit. ............... $749.50
240-500-2 . Wired........... $949.50
The world at your finger tips!

VIKING "KILOWATT" AMPLIFIER
This exciting unit is the only power amplifier available which will deliver full 2000 watts SSB* input, and 1000 watt CW and plate modulated AM Class C final amplifier operation provides plate circuit efficiencies in excess of 70%. Continuous coverage 3.5 to 30 mcs. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

Cat. No. Amatuer Net
240-1000-1 Wired and Tested $199.00
251-101-1 Matching desk top, back and 3 drawer pedestal, FOB Corry, Pa. $132.00

*The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of two times average or more, depending upon individual voice characteristics.

you’ll get more with a VIKING!

"6N2" THUNDERBOLT
POWER AMPLIFIER
Rated at a solid 1200 watts P.E.P.* input SSB and DSB, Class AB1; 1000 watts CW input, Class C; and 700 watts input AM linear, Class A1—with continuous bandswitched coverage on 6 and 2 meters. Wide range pi network output—effectively TVI suppressed—outstanding efficiency! Drive requirements: 5 watts in Class AB1 linear, or 6 watts Class C continuous wave. Completely self-contained. With tubes.

Cat. No. Amatuer Net
240-362-1-Kit $594.50
240-362-2-Wired 589.50

"6N2" TRANSMITTER
A compact VHF transmitter with instant bandswitching coverage of both 6 and 2 meters. Power input: 150 watts CW; 100 watts AM phone. Completely shielded and TVI suppressed. External VFO or crystal control—may be used with Viking "Ranger," Viking I, "Valiant," or similar power supply-modulator combinations. With tubes, less crystals.

Cat. No. Amatuer Net
240-201-1-Kit $129.00
240-201-2-Wired 169.60

New Catalog
Your complete guide to amateur radio’s most popular equipment. Includes details and schematics on all Johnson transmitters and amplifiers, as well as specifications on the complete line of station accessories, keys and practice sets, and antennas. Write for your free copy today!

COMING SOON...the new Johnson filter type sideband transmitter with 60 db sideband suppression!

FIRST CHOICE AMONG THE NATION'S AMATEURS

Viking

E. F. JOHNSON COMPANY • WASECA, MINNESOTA
For The Active Amateur

Record keeping can often be tedious. But not with the ARRL Log Book. Fully ruled with legible headings it helps make compliance with FCC rules a pleasure. Per book ........................................ 50¢

Mobile and portable operational needs are met by the pocket-size log book, the Minilog. Designed for utmost convenience and ease.................. 30¢

First impressions are important. Whether you handle ten or a hundred messages you want to present the addressee with a neat looking radiogram . . . and you can do this by using the official radiogram form, 70 blanks per pad, 35¢

If you like to correspond with fellow hams you will find the ARRL membership stationery ideal. Adds that final touch to your letter. Per 100 sheets ........ 1.00

Strictly Modern!

* Old maps are quaint but ARRL does not compete with ancient cartographers . . . we leave that market to the antique shops. Our World Map is strictly modern.

No active amateur can afford to be without one of these popular and useful adjuncts to good operating. Here is why the ARRL World Map is such a favorite:

As soon as you hear a DX station you can see exactly where he is—the country prefixes are not just listed in the marginal index; they’re printed on the countries, themselves. You can tell his direction from you, and his distance. There’s no question about which continent he’s in—boundaries of the six continents are plainly marked.

40” x 30” 8-Color Map, $2.00, postpaid anywhere in the world

The time zones are plainly marked, too. Call areas of thirteen countries are shown. Principal cities are designated. There’s a scale of miles, another of kilometers. Printed on heavy map paper measuring 40” wide x 30” high, in 8 colors that really stand out, this new ARRL World Map is easily read from your operating position.

AMERICAN RADIO RELAY LEAGUE, INC.

38 LA SALLE ROAD • WEST HARTFORD 7, CONN.
FROM HEATH
...
9 NEW
RADIO
AMATEUR
KITS

TEN-TRANSISTOR
"MOHICAN" GENERAL COVERAGE
RECEIVER KIT (GC-1)
An excellent portable or fixed station receiver! Many firsts in receiver design for outstanding performance . . . ten transistor circuit . . . flashlight battery power supply . . . ceramic IF transformers. The amazing, miniature transformers used in the GC-1 replace transformer, inductive and capacitive elements used in conventional circuits; offer superior time and temperature stability, never need alignment and provide excellent selectivity. Other features include telescoping 54" whip antenna, flywheel tuning, tuning meter, large slide-rule dial and attractive, rugged steel case in gray and gray-green. Covers 550 kc to 30 mc in five bands. Electrical bandwidth on five additional bands cover amateur frequencies from 80 through 10 meters. Operates up to 400 hours on 8 standard size "C" batteries. Sensitivity: .1 uv, broadcast band; .2 uv, amateur bands for 10 db signal to noise ratio. Selectivity: 3 kc wide at 6 db down. Measures only 6 3/8" x 12" x 10". 20 lbs.

Heathkit XP-2: plug-in power supply for 110 VAC operation of GC-1. (optional extra), 2 lbs. $3.95

100 KC CRYSTAL CALIBRATOR KIT (HD-20)
Align or check calibration of your communications gear with this versatile ham aid. Provides marker frequencies every 100 kc between 100 kc and 64 mc. Transistor circuit is battery powered for complete portability. Accuracy is assured by .005% crystal furnished. Measures only 2 3/8" x 4 3/4" x 2 1/4". 1 lb.

GC-1
$109.95
$11.00 down.
$10.00 monthly.

HD-20
$14.95

7 more kits on following pages
"CHIPPENWA" KILOWATT LINEAR AMPLIFIER KIT (KL-1)

Here is a top-quality kilowatt rig with all the features you've been looking for. Operates at maximum legal power input on all bands between 80 and 10 meters, in SSB, CW or AM linear operation. Premium tubes (4-400A's), forced air cooled with centrifugal blower. Grid neutralized, continuous plate current monitoring, extensive TVI shielding. Features both tuned and swamped grid circuits to accommodate all popular excitors. Operates class A1B for SSB and AM linear service and high efficiency class C for CW service. Convenient panel controls include power switch, tune-operate switch, HV on/off switch, final bandswitch, meter switch, grid bandswitch, grid tuning, mode switch, plate tuning, plate loading and bias adjust. Accessory connectors are provided on the rear apron of the chassis for complete compatibility with all control circuitry in the Heathkit "Apache" Transmitter. Two meters provided; one monitors final plate current; the other indicates switch selected readings of final grid current, screen current, and plate voltages. Send for complete specifications now. 70 lbs.

A PERFECT COMPANION FOR THE "CHIPPEWA" KILOWATT POWER SUPPLY KIT (KS-1)

Ruggently constructed for heavy-duty use in medium to high power installations, the KS-1 fills the requirements of a top-notch power supply with economy and safety. Features an oil-filled hermetically sealed plate transformer, "potted" swinging choke input filter and 60-second time delay relay. Line filters minimize RF radiation. Maximum DC power output is 1500 watts. Nominal voltage output, 3000 or 1500 volts. DC current output, average 500 ma, maximum 1000 ma. Control circuitry is arranged to allow remote installation. The KS-1 employs two 866A half-wave mercury vapor rectifiers in a full-wave, single-phase configuration. Power requirements: 115 V, 50/60 cycles, 20 amperes; 230 V, 50/60 cycles, 10 amperes. 105 lbs.

6-METER CONVERTER KIT (XC-6)

Extends frequency coverage of the Heathkit "Mohawk" and most other general coverage receivers into the 6 meter band. Converts 50-54 mc signals to 22-26 mc. 3-tube circuit provides two RF stages and low-noise triode mixer. Calibration accuracy assured by .005% overtone crystal supplied. Provision for external RF gain control. 6 lbs.

2-METER CONVERTER KIT (XC-2)

This top-quality 2-meter converter may be used with receivers tuning any 4 mc segment between the frequencies of 22 and 35 mc when appropriate crystal is used. Converts 144-148 mc signals to 22-26 mc with .005% overtone crystal supplied. High quality parts used throughout. Silver plated chassis and shields. 7 lbs.
TWO BRAND NEW MODELS
HEATHKIT 10 & 6 METER TRANSCEIVER KITS
Complete ham facilities at low cost! The new Heathkit transceivers are combination transmitters designed for crystal control and variable tuned receivers operating on the 6 and 10 meter amateur bands (50 to 54 mc HW-29 and 28 to 29.7 mc for HW-19) in either fixed or mobile installations. Highly sensitive superregenerative receivers pull in signals as low as 1 microvolt; low power output is more than adequate for "local" net operation. Other features include: built-in RF trap on 10 meter version to minimize TVI; adjustable link coupling on 6 meter version; built-in amplifier metering jack and "press-to-talk" switch with "transmit" and "hold" positions. Can be used in ham shack or as compact mobile rigs. Not for Citizen's Band use. Microphone and two power cables included. Handsomely styled in mocha and beige. Less crystal. 10 lbs.

VIBRATOR POWER SUPPLIES: VP-1-6 (6 volt), VP-1-12 (12 volt). 4 lbs. Kit; $8.45 each, wired; $12.95 each.

NEW! IMPROVED DESIGN
TRANSISTOR MOBILE POWER SUPPLY (HP-10)
Brand new power supply for mobile gear; features all-transistor circuit, instant starting, high efficiency, rugged construction. Operates from 11 to 15 VDC input; at 12 VDC, provides 600 VDC @ 200 ma, or 300 VDC @ 150 ma & 300 VDC @ 100 ma simultaneously, at 120 watts. Negative 150 volts @ 30 ma also provided. Max. ambient temp., 150 @ 120 watts ICAS. Input current requirements: 2 amps, idling; 13 amps, full output. Includes heavy filtering of input and output leads, remote relay control of primary power, silicon rectifiers, and extruded aluminum heat sinks for efficient cooling of power transistors. Measures 8" x 7½" x 6½", 10 lbs.

Expected Shipping Date late April

HP-10

$44.95

ORDER DIRECT BY MAIL OR SEE YOUR HEATHKIT DEALER*
*The convenience of Local Heathkit Sales and Service costs but a few dollars more.

HEATH COMPANY
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TMC's 10,000 WATTS IS NOW

GPT-10K

Over 100 in use in commercial and military installations throughout the world have made this transmitter one of the best known in its field.

Thousands of Hours...

...of continuous operation under all conditions have proven its ability to give long term, trouble free, stable communication over the frequency range of 4 to 28 megacycles on...

SSB · ISB · DSB · CW · AM · FSK

MOBILE,
SHIPBOARD and
FIXED

applications have tested its ability to take a beating. This rugged, compact transmitter can take it and like it. Ease of tuning and maintenance make the GPT-10K ideal for any installation. This field tested and thoroughly proven 10,000 watt transmitter is now used as a driver for the TMC Model GPT-40K (AN/FRT-40) where added power is required.

The TECHNICAL MATERIEL CORPORATION
The GPT-40K completely self-contained transmitter, including all power supplies and ventilating equipment is, as shown above, housed in four modular assemblies occupying only 40 square feet of floor space.

4–28 mc CCS, 40,000 watts PEP, 20,000 FSK-CW.
1 part in 10^6 per day stability, 320,000 channels, available with SBG-1 (AN/URA-30)
IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1803 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input!

Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WJAD and ARRLC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-TI2TG)

List of 105 countries/stations worked with 65 watts and a V-80 vertical

BY1US KG4AI VK3YL
CE30Z KG6FAE VK9XX
ZL5AA KH4J VK9AT
CO2WD KL7BZ VK8C
CN2BK KM6AX VP2KFA
CN8FB KP4ACF VP2AY
CR9AH KP6AL VP2D
CT1CB KR6BVP2MK
 CX2PD KZSAA VP5U
 DL1FF KV4A VP2SW
 DU7SV KAC5A VP5CP
 EA1FD KX5AF VP5BH
 EJNH KZ6CS VP6TR
 FW9G LA7SG VP7NM
 FB8EZ LU2DFC LU1ZS
 FG7XE L2IKSP VP9BK
 FK8AL OA4AU VR3DA
 FM7WT OE9EJ VR8B
 FG8AD OH2TM VS1HC
 G2DOG OX8FF VS2DW
 GC8DO ON4AY V6CNI
 GI3WUI KG1AX XE1JP
 GM3GJB OZ2KK XW8AJ
 GW3LHN PA8FAB YN1JW
 HAA8P PJ5AA YU3PS
 HC6IN PJ2NE YV5HL
 HC8UX P2Y2W ZC5AL
 HE9LAC PY8NE ZE1J
 HP1LO SIR9CQB ZK1B
 I1MV SP6BY K6HMG/ZK1
 JA1ANG T12LA ZK2AD
 JD1HA UA1AU ZL1A8E
 WI1AW UA1KK8 ZL3A
 K9MBZ UG2AZ ZN6AS
 KC4AF VE8OJ ZS1OU

FACTS ON THE GOTHAM V-80 VERTICAL

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use throughout the world.
- Simple assembly, quick installation.
- Withstands 75 mph winds.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.

73
GOTHAM

ADVERTISEMENT

112
AN APPEAL TO INTELLIGENCE

A product that is consistently advertised in QST month after month, year after year, has to be good. Over 10,000 GOTHAM antennas have been purchased by QST readers. Even the “price-is-no-object” customers choose GOTHAM antennas on the basis of performance and value. Select your needs from this list of 50 antennas:

Airmail Order Today — We Ship Tomorrow
GOTHAM
Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use, Proven Gotham Value!

<table>
<thead>
<tr>
<th>Band</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-10</td>
<td>TWO BANDER</td>
<td>$29.95</td>
</tr>
<tr>
<td>10-15</td>
<td>TWO BANDER</td>
<td>$34.95</td>
</tr>
<tr>
<td>10-20</td>
<td>TWO BANDER</td>
<td>$36.95</td>
</tr>
<tr>
<td>15-20</td>
<td>TWO BANDER</td>
<td>$38.95</td>
</tr>
</tbody>
</table>

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander is individually fed (32 or 72 ohms) to its elements and is not frequency sensitive, performs with baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

<table>
<thead>
<tr>
<th>Band</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-10-15</td>
<td>$39.95</td>
<td>10-15-20</td>
</tr>
</tbody>
</table>

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

<table>
<thead>
<tr>
<th>Band</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deluxe 6-Element</td>
<td>$9.95</td>
<td>12-El</td>
</tr>
</tbody>
</table>

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

<table>
<thead>
<tr>
<th>Band</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Std. 3-El Gamma match</td>
<td>$12.95</td>
<td>T match 14.95</td>
</tr>
<tr>
<td>Deluxe 3-El Gamma match</td>
<td>$21.95</td>
<td>T match 24.95</td>
</tr>
<tr>
<td>Std. 4-El Gamma match</td>
<td>$16.95</td>
<td>T match 19.95</td>
</tr>
<tr>
<td>Deluxe 4-El Gamma match</td>
<td>$25.95</td>
<td>T match 28.95</td>
</tr>
</tbody>
</table>

10 METER BEAMS

Ten meter addicts claim that ten meters can’t be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30-50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

<table>
<thead>
<tr>
<th>Band</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Std. 2-El Gamma match</td>
<td>$11.95</td>
<td>T match 14.95</td>
</tr>
<tr>
<td>Deluxe 2-El Gamma match</td>
<td>$18.95</td>
<td>T match 21.95</td>
</tr>
<tr>
<td>Std. 3-El Gamma match</td>
<td>$16.95</td>
<td>T match 18.95</td>
</tr>
<tr>
<td>Deluxe 3-El Gamma match</td>
<td>$22.95</td>
<td>T match 25.95</td>
</tr>
<tr>
<td>Std. 4-El Gamma match</td>
<td>$21.95</td>
<td>T match 24.95</td>
</tr>
<tr>
<td>Deluxe 4-El Gamma match</td>
<td>$27.95</td>
<td>T match 30.95</td>
</tr>
</tbody>
</table>

FREE! FREE! FREE!

Valuable catalog of 50 different antennas, with specifications and characteristics. Gives bands and frequencies covered; element information, size of elements, boom lengths, power and gain figures, weight, feed line used, polarization, and other valuable information. Send card today!

CITIZENS BAND ANTENNAS: Any of our ten meter beams or the V40 vertical is perfect for the CB operator

New! Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

<table>
<thead>
<tr>
<th>Band</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam #R6 (6 Meters, 4-El)</td>
<td>$38.95</td>
<td></td>
</tr>
<tr>
<td>Beam #R10 (10 Meters, 4-El)</td>
<td>$40.95</td>
<td></td>
</tr>
<tr>
<td>Beam #R15 (15 Meters, 3-El)</td>
<td>$49.95</td>
<td></td>
</tr>
</tbody>
</table>

15 METER BEAMS

Fifteen meters is the “sleeper” band. Don’t be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working with low power is a common occurrence on fifteen meters when you have a Gotham beam.

<table>
<thead>
<tr>
<th>Band</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Std. 2-El Gamma match</td>
<td>$19.95</td>
<td>T match 22.95</td>
</tr>
<tr>
<td>Deluxe 2-El Gamma match</td>
<td>$29.95</td>
<td>T match 32.95</td>
</tr>
<tr>
<td>Std. 3-El Gamma match</td>
<td>$26.95</td>
<td>T match 29.95</td>
</tr>
<tr>
<td>Deluxe 3-El Gamma match</td>
<td>$36.95</td>
<td>T match 39.95</td>
</tr>
</tbody>
</table>

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRQ and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

<table>
<thead>
<tr>
<th>Band</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Std. 2-El Gamma match</td>
<td>$21.95</td>
<td>T match 24.95</td>
</tr>
<tr>
<td>Deluxe 2-El Gamma match</td>
<td>$31.95</td>
<td>T match 34.95</td>
</tr>
<tr>
<td>Std. 3-El Gamma match</td>
<td>$34.95</td>
<td>T match 37.95</td>
</tr>
<tr>
<td>Deluxe 3-El Gamma match</td>
<td>$46.95</td>
<td>T match 49.95</td>
</tr>
</tbody>
</table>

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE NOVICE WHO OPERATES 40 AND 15.$14.95

V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name: ____________________________
Address: ____________________________
City: __________________ Zone: ______ State: ______
CONVERTERS (TRC-1) Three transistors, crystal controlled, pretuned. 10 meters or Citizens Band. RF amp., mixer/osc. Double tuned front end. IF output 6 MC. Other IF on special order. Power: 15 VDC @ 5 ma. Wired and tested with crystal $17.95
TRC-2 Two transistors, double tuned front end. Crystal controlled. Standard IF, BC band. Other IF on special order. For 75, 40, 20, 15, 10 meters and Citizens. Power: 6-12 VDC @ 4 ma. Wired and tested with crystal $10.50

MIXER IF UNIT (TRB-1) Six transistors, 2 diodes. 6 MC mixer. Crystal controlled local oscillator. 455 KC IF. Highly effective noise limiter and squelch. Combine with Converter and Audio Units makes dual conversion superhetodyne receiver. Input: 6 MC standard. Specify frequency. Wired and tested with 2 crystals $32.50

AUDIO UNIT (TRA-2) Three transistors. Input: 100,000 ohms and 50 ohms. Speech amp. for dynamic microphone. Push-pull power amp. 500 ohm output for modulation. 3.2 ohm output for speaker. 300 milliwatts output. Idle current 10 ma. Peak current 80 ma @ 15 VDC. Wired and tested $21.50

now for the first time a complete

from International Crystal Mfg. Co.
AMATEUR 27 MC CITIZENS BAND
- Converters  Mixer IF  Audio Unit
- Transmitters  Oscillators

This outstanding lineup of transistor sub-assemblies offer "exciting" new compact receiver and transmitter construction. Designed and built to International's finest standards, these printed circuit units may be used separately or combined to build extremely portable transmitters and receivers for the Amateur and Citizens bands.

INTERNATIONAL CRYSTAL MANUFACTURING CO., INC.
18 NORTH LEE • OKLAHOMA CITY, OKLA.

Wired & tested less crystals and transistors $10.00
#1 Transistor Kit (100 milliwatts output) $17.50
#2 Transistor Kit (50 milliwatts output) $9.00
Crystals type FG0 for Citizens band (.0025%). $4.75 each
Crystals type FA-5 for Amateur (.01%). $4.00 each

OSCILLATORS (TRO-1) (TRO-2) (TRO-3) Three separate transistor units with total of 8 frequency ranges (100 KC to 60 MC). Average output varies over frequency range. Average 1 volt across 2200 ohms. Power: 9 VDC @ 3 ma.

- (TRO-1) Low freq. 100-300 KC and 200-5000 KC.
- (TRO-2) Medium freq. 3000-20,000 KC.
- (TRO-3) Overtone. 15 MC — 60 MC in 5 ranges. Specify freq. range. Use type FA-5 or F-605 crystals. Wired and tested less crystal $4.00

POWER AUDIO OSCILLATOR (TRO-10) For calibration purposes. Delivers 2 volts across 50 ohms. Frequency 1000 cycles or 2000 cycles. Specify when ordering. Power: 6 VDC @ 100 ma. Wired and tested $14.50

- AUDIO FREQUENCY COUNTER AMPLIFIER (TRA-30) Frequency 200 cycles to 30 KC. When used with 100 microampere meter makes sensitive frequency counter. Input for saturation: .001 volts rms. Counter amplifier only, less meter, wired and tested $32.50

line of transistor subassemblies . . .

See the new International all transistor Traveler 27 MC Transceiver at your international dealer or write for complete details. 15 transistors . . . built-in speaker . . . separate phone jack . . . mounting bracket for mobile use. COMPLETE, with portable nickle cadmium battery and built-in charger, microphone, 2 sets crystals, whip antenna, carrying strap, mobile mounting bracket—only $249.50

ALSO AVAILABLE:

Traveler — 115 VAC
Model, wood case, 2 sets crystals, microphone $199.50

ORDER DIRECT from International. Terms F.O.B. Oklahoma City, Other shipments C.O.D. On C.O.D. orders of $25.00 or more, 1/2 down payment required with order.
Station Activities

(Continued from page 108)

ARRL affiliate recently. Appointments: W2MTA-ORS, K2HVD-ORS, K2VX-ORS, W23PX-ORS, K2XZQ-ORS, K2QF-ORS, K2XZQ-ORS, K2VR-ORS, K2VX-ORS, K2XZQ-ORS, K2VR-ORS. K2VX-ORS and K2XZQ-ORS as OBSs, K2VX-ORS and K2XZQ-ORS as OBSs. K2WZ reports the Red Cross Net for YGS meets at 3:30 PM, on the 1st Wed. of each month. W28C is NCS. W2RJ is recovering from a serious illness. W28SK has arrived at C2RJ, W2RJ has arrived at C2RJ. W29F was a visit from HYCZ, who is an exchange student from Syria. The North Clumbeau ARC will hold its annual banquet Apr. 30. Better get your reservations in now for the Western N.Y. Hamfest sponsored by RAF to be held at Daul Post May 14. The Ogdensburg ARC got off to a flying start on Charter Night May 5. W2BB was the main speaker. W28F is present and the club sponsors Novice and Advanced classes 6 hours per week and every member either attends or teaches. All members are working on W9S. K2RFC reports that more than 250 hours and XV1L attended the dinner and social sponsored by the combined Broome County Area clubs on Feb. 27. W2BKC reports that the Utica Red Cross Chapter has provided funds for a complete station and emergency power supply. The station is licensed with the call W2JMK. Credit goes to all area hams organized as the Amateur Emergency Communications Assn. of Utica. W3HVV is inviting area clubs to affiliate. The clubs would get the benefit of a large organization for administration and program, yet have a chance to remain autonomous. W3HHZ has a new home. Former QTH was to be Q9Z, now the new QTH is Q9Z. W3HVV reports that the W9SARC is still active. W3HVV reports that the DX-100, a Super-Pro and the new call W2JMK, reports.

TRAFFIC

(Cont. on page 112)

CENTRAL DIVISION

ILLINOIS—SCRM: Edmond X. Metzger, WBPX-

PM; SCM: Grace V. Raines, 901 E. 35th St., Peoria, IL; RSM: USR, PANI, RYU, EC of Cook County; HPG, Section net: ILN, 3315 ke, Mon., through Sat., at 1900 CST. USR has been appointed as the new RSM for this section because of the resignation of PCQ, who has taken on additional duties which will curtail his operating time. Many thanks to the sympathy cards received in the recent death of my father. LCG received his WAS. The Mississippi Valley Radio Club elected FWR and K3PPF as its new officers. K3HVL, the Lake Forest Boy's Academy

(Continued on page 118)
COMPARE!

...you get the best of all
in the all-new

HAMMARLUND HX-500

SSB TRANSMITTER

The result of two solid years of engineering and development by the best communications engineers in the business — and now ready for your evaluation. It's the all-new HX-500 SSB transmitter, loaded with advanced design features and performance.

$695.00 Amateur net.

HAMMARLUND MANUFACTURING COMPANY, INC.
460 West 34th Street, New York 1, N.Y.

In Canada:
White Radio, Ltd.,
41 West Ave.,
N. Hamilton, Ont.
station, being reactivated by KKREU. KOWUP and K9WMD are the two newest hams in the Quinney Area. UYV has completed his linear and is now a full-fledged n.a. for winter. The council of General Class, K9YVG reports that the traffic count for the No Name Net for January was 195 messages in 24 sessions. The Net ran a total of 448 messages in 24 sessions. The H.N handled 333 pieces of traffic in 17 sessions. K9KYZ, net manager of the North Central Phone Net, reports that the Net ran 358 messages in 24 sessions. K9QJ recently obtained license as a 1B in Rock Island and McLeer County. K9QJ is using a new D-104, TZN has received his license and is now maintaining a daily 6-meter Net in the Quincy area. The EC of Mowea County, has added Chosen and Cookeville to his D.C. Net, on 6 meters with Gousete Communicators. K9L0 has been obtained by WZ8K, the EC of Mount Morris County, has added Chengo and Cookeville to his D.C. Net, on 6 meters with Gousete Communicators. K9L0 has been obtained by WZ8K, the EC of Mount Morris County, has added Chengo and Cookeville to his D.C. Net, on 6 meters with Gousete Communicators.

INDIANA—SCM: Clifford M. Singer, W8SWD—Aest. SCM: Arthur G. Evans, VTDC—SEC: NQY. PAMS BJK, K9WZG, K9VWZ, K9VYU. The news of the New Year’s Day 30th Anniversary Special Nets has been broadcast on February 9th. The SCM announces that the 30th Anniversary Special Nets will be held on February 24th and March 10th. The SCM reports that the 30th Anniversary Special Nets will be held on February 24th and March 10th. The SCM reports that the 30th Anniversary Special Nets will be held on February 24th and March 10th.


DAKOTA DIVISION

NORTH DAKOTA—SCM: Harold A. Wengel, W7HA—PAM: K5KJL. RT: K7Z. K7KSS reports that he has received his new license on 28 meters and is now transmitting on 28 meters. The SCM reports that he has received his new license on 28 meters and is now transmitting on 28 meters. The SCM reports that he has received his new license on 28 meters and is now transmitting on 28 meters.

SOUTH DAKOTA—SCM: J. W. Sikorski, WBRN—SEC: SCT. Ex-492 has been returned to Sioux Falls after several years of service as a 492. The South Dakota Amateur Radio Club has a new president, John S. Johnson, W8SS. The South Dakota Amateur Radio Club has a new president, John S. Johnson, W8SS. The South Dakota Amateur Radio Club has a new president, John S. Johnson, W8SS. The South Dakota Amateur Radio Club has a new president, John S. Johnson, W8SS. The South Dakota Amateur Radio Club has a new president, John S. Johnson, W8SS.

MINNESOTA—SCM: Mrs. Lydia S. Johnson, W8BBJ—Aest. SCM: Rollin O. Hall, B3ET. SEC: TUR. Ex-492 reports that he has received his new license on 28 meters and is now transmitting on 28 meters. The SCM reports that he has received his new license on 28 meters and is now transmitting on 28 meters. The SCM reports that he has received his new license on 28 meters and is now transmitting on 28 meters. The SCM reports that he has received his new license on 28 meters and is now transmitting on 28 meters.
1369 QSL's atop the record-breaking log sheets of W9IOP

The final test of any receiver is more than a screen room check. It's made on the operating table of ham shacks everywhere under tough, realistic band conditions.

If everyone has done his job right ... and this means operating features as well as electrical characteristics ... the new receiver is on its way to success. And occasionally with zeal and understanding uncommon except among people who love their work, a product is produced that so far outshines anything comparable in cost that it becomes a classic. We are confident the new RME 6900 will earn this reputation.

Here is a report on serial No. 1, delivered to W9IOP ... one of the RME executives — three hours before the 1959 ARRL Sweepstakes. In the 40 hours of operating time permitted, 1,369 contacts in all sections were worked ... a new all-time national SS record was on the books. The RME 6900 meets all of its electrical specifications but what's important and cannot be merely put into words is the enormous flexibility and the great operating ease which makes it possible for an operator, even an inexperienced one, to take a new receiver and handle it as he would an "old friend."

Yes, the RME 6900 is a classic receiver ... the perfect joining of skill in the laboratory with certain knowledge of what operators require. We repeat our statement. Whether you operate CW, single sideband or AM, you will have the almost uncanny feeling the 6900 was designed solely for you.

- **CONTROLS:** 11 1/2" Single Slide Rule Tuning Dial; Logging Scale.
- **COVERAGE:** 80, 40, 20, 15 and 10 on 5 bands plus 10 to 11 mc for WWV or WWVH.
- **Peak Selectivity** plus tunable "T" Notch.
- **Internal 100 kc Hermetically Sealed Crystal Calibrator.**
- **500-ohm and 4-ohm Outputs.**
- **Noise Limiter for SSB and CW, AM.**
- **Separate Detector for Single Sideband.**
- **S Meter Calibrated in 10 db Steps Above 59 for Better Reading.**
- **Improved Fast Attack AVC Circuit.**
- **Selectable Sideband.**
- **Panel of Attractive Grey "Clad-Rex" Vinyl Bonded to Aluminum with Charcoal Trim.**
- **Front Panel Controls Re-Grouped for Ultimate Operating Ease and Convenience.**
- **SENSITIVITY:** 1 mv, 30% Modulation for 100 mw output.
- **S-N-R:** 10 db at 1 mv Input.
- **SELECTIVITY:** 500 cps, 6 db down, in CW mode.

RME Electro-Voice®

Dept. 50-Q BUCHANAN, MICH.
SHORTWAVE PROPAGATION by Stanley Leinwohl
(Radio Frequency and Propagation Mgr.-Radio
Free Europe). Of special interest to those concerned
with shortwave communications, this text provides a
modern up-to-the-minute analysis of shortwave
propagation. Ionosphere characteristics are dis-
cussed together with the nature of radio waves.
The book then carries the reader into the sky wave,
measuring the ionosphere, ionospheric variations,
the sunspot cycle, and abnormal phenomenon. Sky
wave transatlantic communications are covered and the preparation
of MUF curves are discussed. Includes Rider. Global Time
Conversion Chart. #221, $3.90.
RIDERS SOUND-N-SIGHT CODE COURSE
by Lewis Robins & Reed Harris
• applies a modern learning—psychological prin-
  ciple proved successful in learning processes.
• uses LP records to teach you to hear signal
  pattern correctly and identify it—how to transmit.
• uses identification cards to teach you the correct
  letter associated with each signal pattern.
• uses instruction book to speed your progress.
• plus an imaginary instructor (in complete and
  novel courses), provides correct answers to speed
code learning. Many people have learned to receive
5 words per minute within 9% hours. Eliminates
code confusion and memory loss.

3 INDIVIDUAL COURSES—THERE’S ONE FOR YOU
COMPLETE COURSE (9-20 words per minute) • Six
10" LP records (192 minutes of recording, 28
recordings), identification cards, book. #REC-001, $15.95.
ADVANCED COURSE (9-20 words per minute) • Three
10" LP records (96 minutes of recording, 28
recordings), identification cards, book. #REC-100, $9.50.
BEGINNER’S COURSE (5-10 words per minute) • Nine
6" LP records (90 minutes of recording, 27
recordings), book. #REC-200, $8.95.
Records prepared in collaboration with the N.Y.
Institute of Technology and w/Decca Records.

DELTA LEAGUE
ARKANSAS—SCM, Ulmen M. Grimes. WAZJ-
SEC: K53K, PAM: DYL RM: KSTVY. WEE, EC of
Boone County, reports that they now have AREC fully
operational and equipped to handle any communications
emergency that might arise. We're happy to see more of the counties follow this fine example.
WBY 909 has a 20w A on the air. K5TYV has
a new rig on QSO 1 and is running 100 watts on s.a.b.
and 150w on average. K55J is the proud holder of a new text.
Class ticket. We know how happy El was with it. AUV has
been ill for the past several months. We sure do hope
her pup will be well. WGV has been running its RITY
converter. K5TQA has new beam atop a new tower. The Dixie
Y.LF Net met recently and voted to change the name to
Ark. Y.H.F. Club and Net. K5GOW reports that four
more towns are reporting New

LUMISANA—SCM, Thomas J. Morigi, WM5MO-
OQSL certificates mailed in good time for renewing.
Traffic reports show an increase in traffic.
Forors and OPS are coming in more often and general
interest is up. At last report, currently moving to
Saint Joseph and who has been FS5T, KP4Z, DL4TJ,
K61K and 6PZW. active on TXN, RN5 and
UTL. His XYL, WM5LW, K5LW, KNSB and
KNSB are in good condition. A new OQ
recently signed up is K5SBF, SKW has been appointed
SKX for the Lake Charles ARC. ARC
festival will be held at the West Monroe Fairgrounds Sun.
May 1. MXQ has been temporarily off the air because
of transmitter trouble. PY QSL QRD is and is active on 144 Mc, with 13 states confirmed.
Route Mgr. CFLC who is on LWR 1000 CST 3615
kilowatt RN5 and 230w on 2 meters and 305w
3070 kHz, and UTL 1000 and 2251 CST 700w
kHz, is always on the lookout for ex servicemen. If you are
interested in handling traffic on a basis of receiving
the listed nets. New officers of the Lafayette ARC include
K5KX, pres.; K5PJ, sec.; W5KITCH, vice-sec.; W5KVT, sec.;
K5PQ, t.s. The new club has a mobile club. Officers are K5KBR, pres.; K5JF, sec.; W5KBR, tss.
JMW recently acquired a new DX-100. K5KX and K5SBF go to the new
KGM, recently of New Orleans, has been transferred
to Dallas. W5 opens s.a.b. with a home-
brew rig and laterly with A5. A5W has
been repositioned OPS and OQSL is in the process of being moved to a new quarters on the lake front in
New Orleans. In the past week, facilities have been set up in the Naval Reserve facility

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(Continued on page 122)
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100Vs

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A new audio limiter followed by a perfectly tailored audio filter makes a "barefoot" 100V sound like a "well mannered" half KW.

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COMPLETELY BROADBANDED — ONLY ONE TUNING CONTROL, THE VFO.

100 WATT OUTPUT 80 through 10 meters — PLUS generous "out of band" coverage.

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UNWANTED SIDEBAND SUPPRESSION 50 DB OR BETTER

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20A 10B 600L MM-2 GC-1 Model A & B Slicer

For further information, write for the new four page 100V brochure.
adjoining the new radio station. ARRL OR schedules are transmitted by W3LSX regularly. Traffic: (Feb.) W3CZ 802, AX3Q 279, KB4GJ 41, LH9G 10, W4MOB 10.

MISSISSIPPI—SCM, Floyd C. Tevection, W5MUC—KX9T, has returned to the air with a kw. AJ4M is planning to return to the air on s.s.b. The first C.W. DX contest showed a fine activity in Mississippi. CKY reports it's contest worked. The recent ice storm caused much havoc in the northern part of the state. The fellows out an FB job providing emergency communications. An on my W3L to Messrs. to meet with the Delta Director and other SCMs of the division. KMLX reports his contest score was 306. Now lots through my address. ESD. YM1, secretary. DJ1B, treas. The Cleveland ARC will hold its annual hamfest June 5 at Indiana. DX is back on the air after burning out a power transformer in his receiver. G7V has a new Hammardlund SP-600. The GAFB MARS Net has changed the Wed. night meeting to Sun. afternoon at 1:00.

TENNESSEE—SCM, W. R. Ingham, W4UJO—SEC: K48N, RM: FX, PAMS: PAH and UOT. HBZ was present with the Boy Scouts. K4PNR worked E1A4 on 80-meter c.w. K4EDB reports Q31 average of 15 in 21 sessions of the Oakland Relay Emergency test. W5K electronical hunts are held each second week. K4OKU is on s.s.b. with a DB-10 and RRV says he is heading for s.s.b. for recovery. K4RZ on HAMR. K4EDB has a new IFN has his 210 DXCC sticker and is going to try 2 and 6 meters. Next appointments: K4AZT as OQ and GES. EC renews: T2Q and K4EDB. Thanks for your reports: OQ, T2Q and K4RZ; GES, K4YL; net, PAH. New calls heard on the C.W. Net are FCU, VNU, WIS, K4H1, K48NR and ZK4N. K4OKU has been made a 100 per cent QNL in 4RN and NCS 4RN each Sat. Traffic: (Feb.) WJPX 102, O6G 301, FX172, G4X 159, EJ 852, VJ 182, YWI 151, K4K6B 189, K4PNR 32, K4RZ 146, AMQ 35, WAFP 24, UFO 21, FCU 30, UVL 20, IFN 14, VNM 11, PAH 11, KB4ED 14, LPM 10, W49ZQ 10, K4H1D 4, WAFP 24, ZQG 4, EJY 1 L (Jan.) W4FP 23, W49N 5, VTS 3.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thompson, WSUD—Asst.: SCM, W. C. Alcor, CDCA, SEC: BAZ, RM: K4GEB, PAM: SZB and K4HCB YEF, PAM: K4ZD.

The Kentucky Net is operating daily on 3790 kc. at 1600 CDT. K4GEB asks for more QNLs from Kentucky. This net is a valuable training aid and supplies KYN with information. K4MGO now has a 6-meter c.w. net in full swing. Technicals have increased their code speed for the General Class examination. K4LSB and others have brought out new mobiles for pledge pick-ups in a telephon. New on KYN are K4JF, and K4GJ, K4LSB soon will be on with Model 15 transceiver. UL is active on 6 meters with W5D. K4DFZ has a new BC-856 for a stand-by rig. S2L is running 600 watts to a new GG liner. K4DFO and K4GCR are now OQ supporting ADH is working a new 6-meter rig with a pair of 100TlTs. DM1V is on 6 meters from Stiegelsville. RHZ reports he is sold on electronic keying for a perfect fl. K4FXN was active in the Novice Roundup. K4J has a perfect attendance record on MKPN for the past four months. KYN reports all received from S2L and K4DFZ. BUB has missed an OQ report for two years. Carl is truly an amateur in the public interest. Traffic: K4GEB 21, W4XZB 21, HZ 124, K4WEZ 21, W4USD 105, K4AX 102, D60 96, W4CDA 75, K4CC 53, HZC 87, W4KQ 87, QCX 87, W4KKG 85, K4HOE 26, ZBZ 22, W4KZ 21, K4DFZ 15, EBY 14, KBK 11, KOH 01, K4HZ 13, VDO 92, W4SYE 11, NUQ 10, EJG 7, ADH 6, K4FUM 6, W4KXP 5, UVH 5, K4QH 5, W4JUI 4, K4SFF 4, MVP 4, K4NXN 4, K4LSB 4, KIS 1.

MICHIGAN—SCM, Ralph P. Theureau, WSFX—Asst: YAN, YNN: SCM, WCC, QCO, FWQ, PAMS: AQA, NOH (G.H.D.), K4EDT and K48ZL. K4KCRD and TIC are new OQs. E3 EM Is turned in 250 violations, 155 Xov, 210 2nd harmonic. The Wolverine S.B. Net is running a new OQ, a new daily, 1900 to 2000, 3395 kc. The Saginaw Valley ARA (Continued on page 14)
NEW!  for... 10 meters!

10 watts input...instant selection of 5 frequencies...a complete transceiver in one compact package!

The 10-meter Viking "Messenger" will qualify for matching funds, having been certified as meeting FCDA specifications.

VIKING 10-METER MESSENER TRANSCIEVER

Ideal for fixed or mobile operation, the new 10-meter "Messenger" is a complete 10-tube (including rectifier) crystal-controlled transceiver! Superhet receiver offers excellent sensitivity and selectivity...with effective ANL, AVC, and positive-acting Squelch circuits. Transmitter section has a 7054 crystal oscillator coupled to a high gain 7061 final amplifier—puts out a clean, crisp well modulated signal! Other features: wide range pi-L network output circuit; automatic "transmit" indicator; push-to-talk ceramic microphone; self-contained power supply.

Pre-tuned for 29.4 to 29.7 mcs.—covers any 5 frequencies within a 300 kc segment of the 10-meter band. Compact and lightweight—exceptionally easy to install anywhere. 5½" high, 7½" wide, and 11½" deep. For 6 V D.C. and 115 volts A.C., 12 V D.C. and 115 volts A.C. or 115 volts A.C. only. Dual voltage units will operate on D.C. voltage with just the switch of a power cord (furnished with the unit). Complete with power cords, tubes, microphone, and crystals for one frequency covering 29,640 kc. National calling and emergency frequency. Up to 4 additional crystal pairs may be installed for other frequencies of your choice for routine operation.

Cat. No. Amateur Net
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For detailed specifications and further information, write for Specification Sheet 737—yours on request!

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furnished communications, mobile, for the Regina Mutual March on Polio. Seventeen operators were involved. The Red Cross in St. Clair County called a surprise alert. In 30 minutes 14 AREC hams were on the job, with VC HQC in charge. Genesee Co. operators were joined by the club station ACW going on nets on 80, 75, 30 and 2 meters. Ice pulled down all 6 towers and antennas on KDJ’s amateur farm. The St. Clair Valley ARC officers are KSJWJ, pres.; KSIEK, vice-pres., KNSOZ, secy., treas.; VE3DFU, secy. Metro (Detroit Area) Ham Net now refers to “Eyeball QSO” as “bump talk.” Is that true? EIR, Oakland Co. EC, comes out with a well-AREC bulletin. QBO has 100 watts and a linear amplifier set up in a house trailer. QLS gets Got Tha elimination? QIC has a new NC-300. KSKOO gets the State Police “Ham of the Month” award. BFF and KMSRG report only local contacts on 6 and 2 meters. SWF relayed a message from Santiago to Pittsburgh for a new drug, which was received in time. FDO reports an RAIE-90 and an ARRL-13 were donated to the ARC by KSKNB. KSNQLL learns traffic-handling in the Indiana; Michigan; Novi, and KSEC W with the 35-w.p.m. sticker. KIF lost his mast in a storm, JYU handling Antarctic traffic and has had 1225 contacts so far. FSZ has a new Viking Navigator. KSKCO has a new NC-300. The Muskegon RC officers are KTJ, pres.; FDE, vice-pres.; KSBCJ, secy.; KNSAS, treas.; KSKPS, act. The Holland ARC has appointed KPMVY as communications manager. EYAD says c.w. has increased on 6 and 2 meters in the Kalamazoo Area. PT reports that GUV has a 55W final, KSZ and KSKHZ have 45W finals and CVQ is on 22C. KZYT has a twin teletype. The Albion ARC’s officers are LIW, pres.; KNSWFP, vice-pres., ALK, secy., KSJDJ, 15 years old of Grand Rapids, recently being awarded General Class license. Grand Rapids Catholic Central High School has a new station with an Apache and a Mohawk. Traffic: (Reps.) WPQG 830, NQI 234, QVY 220, OJ6 132, WJXN 104, EF 86, KSXE 74, KNQ 74, WJYAN 71, ELW 70, ILP 60, HYM 51, KJJC 49, GJQ 48, AMW 48, WJFJ 47, QVYQ 44, QXG 43, GJPC 42, QT 22, ADP 20, TBP 19, KSNF 18, WACW 17, EDO 16, EJ 14, KSJQLC 12, WSZH 11, KSECW 10, WSDE 8, LG 7, WJQZ 7, QIX 5, KXO 3, COH 2, HLR 3, WSHKT 2, KJX 2, KCO 1, EJH 7, WJXNJ 77, HJH 30, IBI 27, KSCW 21, WSZQ 14, KJJC 9, CJD 5.

OHIO—GOIC, Wilson E. Weels, W8ML—Asst., SCM: J. C. Erickson, 8DA, SEC; RIN. JG: DA and VTP. PAM’s: HZJ, WYS and KSHIG. We, amateurs, there is one outstanding member, Walter Eimer, AEU. He won the Edison Radio Amateur award, sponsored by General Electric Company for 1959, by his untiring efforts in organizing and directing the Cuyahoga County branch of Amateur Radio Emergency Corps. We are all mighty proud of you, Walter. Henry County ARC’s 1950 officers are UPL, pres.; FG, vice-pres.; QIC, secy., and SMW, publicity. Each amateur in North Central NP, RS6 EJN, KZBN and HZM have new Mosley Triband beams. The Massillon ARC’s 1950 officers are NP, pres.; KZBN, vice-pres.; and KNSY, secy. FM, act. mgr., and KSJLQG pub., are. The Seneca RC heard recorded tapes from the Dayton Hanover High V.I.P. Forum and is holding some code classes. KSKF is on 4 meters with a 150-watt LD is in the hospital. VYU is back Stateside after a repair in the Navy. Connecticut County ARC’s Officers are KSRC, KJELW, KJLC, KSKBEN, vice-pres.; and KSNY, secy.-treas. The club’s 6-meter mobiles helped pick up March of Dimes contributions. KSNYN has a new Globe Champion. KSKBF has a new NC-300 and KSKOSK is mobile. KSKXT sent this month: KSECW and KSNPYV have new DX-10s. KSKHZ has a new HQ-175. The New England State College, KSIQH is operating portable in Arizona, NCW moved to Lebanon and has a new G66. KSBMG moved to Dayton; MQI has new tri-band beams. KSKSL has a new Mosler, KCE is the new Radio Officer of Trumbull County C.D. PPI is a 10-meter club. KSMPQG and KSKQPP are affiliated. KSKA is a new ARRL station. KSKFZPQG has a new IV-32A and an IV-33A, RZK has a new IV-37. PKC has a new 800 and the Wheaton ARC’s 1950 officers are KSJY, pres.; KSJLQG, vice-pres.; KSJLQG, secy., and KSJLQG, corr. secy. KFE, act. mgr.; KSKAS, trustee; IKEE moved out of the S.S. KSKNKT is a new ham in Toledo’s Ham Shack, Gossip names OFG as its “Ham of the Month.” KSRRR’s RHD and BZL are new hams. SWX was in the hospital as was KSPE, who has lumbous ARA’s Curvescope tells us that Mr. Sum Oppenheim spoke to the members on Transistors and Their Operation. Practical Circuits, the club’s course, theory classes have been started, KSKGI is engineer at WMNI, KSKTA is mobile on 6 meters now, KSKOGY has a new Service VHF-3, KJELW, KSKQ, NOF, QXG, KJQV, PDF and PFG have their General Class. (Continued on page 190)
Exceptionally compact... mounts readily in car, big or small... or boat. Simple also to tuck under your arm and take home for fixed station use. The 12 volt transistorized supply stays in car... optionally-available AC supply remains at home. This modern, highly effective complete station SSB/CW transceiver doubles your operating pleasure.

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The advanced design of the all-new E-V RME6900 Ham Receiver features the multi-control Modemaster Switch. This switch simultaneously alters the method of signal detection, controls the IF bandwidth, switches the BFO, and changes the AVC operation in accordance with the type of signal to be received. All critical circuitry is thus simultaneously altered and controlled in accordance with the precise mode of operation selected.

see page 119

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“What do you recommend as the best coax relay for ham use?”

Unquestionably the Dow relay No. DK60-G2C. I’ve tried a large number, but personally have found this one to be THE best. Built for 1000 watts of r.f., this relay can take it! I have purposely abused this relay to find out what it could do—and it came thru unscathed and still operating smoothly, quietly and without perceptible r.f. loss. In its price range I doubt that any other relay can touch it. I especially like it for vox operation on SSB—it is truly a little giant—easy to mount and long lasting. I do prefer it to a TR switch using a tube. Show me a better relay for the same money and I’ll buy one! This, I am convinced is the relay for the novice as well as the advanced ham—you pays yer money and yer gets ‘sumpin’ really worth having.”

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Less than 9 oz.

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All Coils Encapsulated in Epoxy Resin

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AT YOUR DISTRIBUTOR
or P. P. From Factory.

MISSOURI — SCM, C. G. Gosch, WBBUL — SEC; KZGFT, KAMs: OUD, and O&Q, PAEs; BVL, OL, O&M, and QMB. Net reports: AM (3560 kc., 1500 CST M-5) 25 sessions, QTC 157, QNI 158, NCS NMBJ 1, KMBJ 2, ARQ 3, KQON 4, OUD 6, KQOC 4, KQOB 3, AMN 100, SQT 150, NCS OUD. IBM (7250 kc., 1200 CST M-F) sessions 21, QTC 491, QNI 503, NCS KMBJ 1, KMBJ 2, KQFR 5, QMB 2, KQFT 4, KQFT 5, KQFT 6, KQFT 7, KQFT 8. QTC 117, WECQ 12, KQFT 12, WECQ 11, FDJ 11, KQG 11, WECQ 10, RJP 10, KQFR 9, WFTC 6, WFTC 9, KQWJ 8, KQWJ 8, KQWJ 8, KQWJ 8, KQWJ 8, KQWJ 8. (Mon. and Thurs. of each week) WECQ is now NCS, with DPK as ANCS, for the Monday session of MEN. Nowice code and theory classes are being conducted at the local YACCA under the sponsorship of the Telegraph Radio Society (Joplin) which was last year an instructor, G4P and TSB were active on MON, RTW, along with many others, was contacted with the NET. KQFT, Greatwood, closed the session traffic tests really are. KQD 9 was active on 75-meter phone with a new sky-wave GEP is moving now, hence no further activity will be curtailed temporarily. KQD 9 is building a new a.s.b exciters. Reports have fallen off somewhat. Please tell us about any activities, including traffic, following Traffic; (Feb.) KQON 103, LTM 629, WSMOM 506, WAL 284, ZBR 186, OUD 102, KIK 101, BVL 69, KQWB 5, HWP 68, WRCV 81, KQWB 54, KQWB 54, WRCV 81, KQWB 54, WRCV 81, KQWB 54, WRCV 81. (Continued on page 134)

For Fixed Station Efficiency Or Mobilizing Safety
Use MOBILIER'S CONTROLLED RELUCTANCE-MIKE. PAT. APPLIED FOR

$19.50 NET
AT YOUR DISTRIBUTOR
or P. P. From Factory.
TELREX CHALLENGER!

**Single Transmission Line**

**"TRI-BAND"**

**Designed to Outperform!**

**Out-Value!**

**Out-Last!**

**Rating 2 KW PEP Rain or Shine!**

**6 Working Elements**

**Clean Deep Nulls**

**26 LBS of Educated Aluminum —— Designed to Outperform Any *100*® Antenna!**

**Install 34 ft. Above Ground (or higher) Sit Back and Have Fun!**

**Looks Like a Beam — Works Like a Beam Should!**

TELREX "TRI-BAND" Arrays World Renowned for Performance, Excellence and Value! The End Result of Striving for Perfection, in the Little Things as Well as the Big.

"The Standard of Comparison"

**ON 10, 15 AND 20**

TELREX HAS —— 141 Models to Choose from —— $5.95 to $690.00 3/4 Meter to 40 Meters

**Other Tri-Bands Available:**

- **Model TO 99 CHALLENGER TRI-BAND** $159.50
- **Model TM 30 MONARCH TRI-BAND** $285.00
- **Model DP 3 ROTATABLE** 16, 15, 20, 16 x Dipole $38.59
- **Model DP 4 ROTATABLE** 10, 15, 20, 40 x Dipole $130.50

**2 elements on 10, 2 on 15, 2 on 20.**

**Antennas Since 1921**

Communication and TV Antennas

**Asbury Park 40, New Jersey, U.S.A.**

131
At NORTHERN CALIFORNIA
AMATEUR SUPPLY
We like the Electro-Voice RME6900 for
• Operating Versatility
• Operating Ease
• Precision Design
• Improved Selectivity
• Flexible Operation

The advanced design of the all-new E-V RME6900 Ham Receiver features the multi-connector Modemaster Switch. This switch simultaneously alters the method of signal detection, controls the IF bandwidth, switches the BFO, and changes the AVC operation in accordance with the type of signal to be received. All critical circuitry is thus simultaneously altered and controlled in accordance with the precise mode of operation selected.

see page 119
NORTHERN CALIFORNIA AMATEUR SUPPLY
3425 Balboa Street
San Francisco, California

XMTRS FOR 160 TO 2 METERS
TECHNICIAN—NOVICE—GENERAL
or Special Freq. 500 KC. to 160 MC.

AOL 285, DGW 144, RRL 125, WZJF 122, NIK 73,
K9ULQ 86, WBFLO 59, KBFDJ 54, SCM 53, DFO 51,
KUA 44, TOP 41, ODF 39, WJOK 32, K9HFD 31,
K9HFB 28, K7GEB 27, K7JOJ 26, WZ9A 25,
MVZ 25, K9QBB 18, WYFR 18, K9VIA 17, C9G 16,
UVF 15, W0WEA 15, K9JWJ 15, WBBJ 14, K9FJU 13,
K9UMS 12, WBFDE 12, K9KUF & FTS, K9KUD & FTS,
K9KUD & FTS, K9KUO 9, WBFDE 9, WZ9Z 6,
WZ0U 5, W0KRS 4, W0VZ 3, W0VZ 2, W0P 1.

NEW ENGLAND DIVISION
CONNECTICUT—SCM. Victor L. Crawford, WITIQ—
K9WCM. OBR and YBH made the BPL LG to QSO
of a CT DX on 6 meters crossband and a VE7 on 2 meters.
YBH is looking for 6 meter QSLs on the sta.

The ARLD DX Test and the RTTY Contest, K9NIMM
saw a new 15-meter contact on 15 meters with a 200
watt rig. The station has been on the air for over
2 months.

In the 15-meter contest, the station had a

Connecticut

See page 119
3425 Balboa Street
San Francisco, California

XMTRS FOR 160 TO 2 METERS
TECHNICIAN—NOVICE—GENERAL
or Special Freq. 500 KC. to 160 MC.

MOD. 248 WITH MOBILE CONNECTIONS & AS SUPPLY
6.0 to 30 mc., with plug-in coils. For Manual & CW, Novice,
General, CAP, Industrial: Complete with 8 x 14 x 8 cabinet
20 meter coils & crystal. Wt. 30 lbs. $79.95
Wt. 20, 10 meter coils $2.91 per band, 160 meter coils $1.60.
MODEL 242 FOR 6 METERS OR 2 METERS — 45 to 50
watts output — 6146 final. Complete with mobile connections.
A.C. power supply, tubes, xtal. Xtal. mike input. Uses 8 mc.
crystals. Lettuce VFO. Swing-up link matches 50-800 ohm
antennas. Same cab, as 240. $98.95
NOW MODEL 262 — 2 and 6 meters on one chassis with separate
sections, tubes and output, making use of the
outstanding RF and audio sections of the 242 with high
efficiency RF output and 100% push-pull plate modulation.
Wt. 22 lbs., 8" x 17" x 8" cabinet. Price with 11 tubes and 2
xtals. $137.50
VFO
Send full amount or $25 with order — balance C.O.D.

LETTINE RADIO MFG. CO.
62 Berkeley St.
Valley Stream, N. Y.

MAINE—SCM. Jeffrey L. Weinlein, WJMN—SEC:
JAN. PAM JX. RM EMF. The Sea Gull Net meets
March, April and May, 7:30 PM. In June, the Pines
meets Mon. through Fri. at 1500 ke. The Maine
She-Speed Net meets Tues., Thurs., and Sat. at 1720 ke.
May have previously OOS, OOS, QO and ORS
appointed in Maine. If you're a League Member and
not an Official Appointee, you're missing out on many
exclusives that are available to you. Contact us for
applications. A New England Area phone net is now
on the planning board of the 1st Regional Net Manager
to help facilitate the distribution of contest information.
A New England Details will be given when formulated.
K9NJL is a new ham in Scarborough. K9NLT and
K9KRF are new in Wiscasset. OOS, OOS, QO
appointed on 2 meters. QVY and K9Q have new Wonders
for 10 meters. CXX has a new 'scope modulator.
Officers of the SPARR are CI9W, vice-pres.; K9KRF, secy.-treas.
The AAC is pleased with its new Globe Scout. How about the Maine
radio clubs elevating their station strength? See OOS
activity reports relating to past, present and coming
events to their SCM? It would help immensely in
completing an accurate summary for publication.
Look at the State, ECs are needed in several counties. Is
your county one of them? Field Day and the Augusta Ham-

camps are just two of the up-and-coming events
all. See you there! (Feb.) W1WJD 7S, ISO 59,
K9KRG 48, HDQ 47, EFZ 47, WJLD 36, CRG 18,
K9SVQ 16, GSF 13, JN1B 12, K9KJQ 8,
W9TQ 4, JAN 3, K9JYD 2, WITKE 2, (Jan., WYFK
29, K9MB 11, W9TQ 8. (Continued on page 134)
Cat. No. 175-509 STORMMASTER is designed for service in areas where maximum physical strength and/or resistance to precipitation static is required. This design results in a reduction of precipitation static interference in the order of 20 db.

- Frequency range .................. 30-50 Mc
- Nominal input impedance .............. 50 ohms
- Maximum power input ................ 500 watts
- VSWR ................................ 1.5:1
- Bandwidth ................................ ± 1%
- Rated wind velocity .................. 100 MPH with 1/8" of ice
- Weight .................................. 80 lbs. at 30 Mc
ELMAR ELECTRONICS

We like the Electro-Voice RME6900 for

- Operating Versatility
- Operating Ease
- PRECISION DESIGN
- Improved Selectivity
- Flexible Operation

The advanced design of the all-new E-V RME6900 Ham Receiver features the multi-control Modemaster Switch. This switch simultaneously alters the method of signal detection, controls the RF bandwidth, switches the BFO, and changes the AVC operation in accordance with the type of signal to be received. All critical circuitry is thus simultaneously altered and controlled in accordance with the precise mode of operation selected.

see page 119

ELMAR ELECTRONICS
140-11th Street
Oakland 7, California

THE LEAGUE EMBLEM

With both gold border and lettering, and with black enameled background, is available in either pin (with safety clasp) or screw-back button type. In addition, there are special colors for Communications Dept. appointees.

- Red enameled background for the SCM.
- Green enameled background for the RM, PAM or EC.
- Blue enameled background for the ORS or OPS.

THE EMBLEM CUT: A mounted electrotate, 5/8" high, for use by members on amateur printed matter, letterheads, cards, etc.

Pin, Button or Cut: $1.00 Each, Postpaid

DECALS: A black and gold decal approximately 4 inches high, designed for use on inner surfaces of automobile windshield slides and windows or outer surfaces such as bumpers, equipment panels, etc., is available at 10 cents each (no stamps, please) to cover costs.

AMERICAN RADIO RELAY LEAGUE
West Hartford 7, Connecticut

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, Jr., W1ALP—SEC; ARG. New appointments: Z8L, as PAM for 2 months; L8S as EC for Section. K8Z, K8K, K8L, K8N, and K8F, have been active in various parts of the state. K8K has been a regular contributor to the Wireless World. K8L has been an active member of the State Convention Committee and has worked hard to promote the interests of AM radio in Massachusetts. K8N has been a frequent contributor to the Wireless World, and K8F has been active in the design and construction of new AM radio receivers.

NEW YORK—K8K has been active in various parts of the state. He has been a frequent contributor to the Wireless World, and has been active in the design and construction of new AM radio receivers.

NEW JERSEY—K8N has been active in various parts of the state. He has been a frequent contributor to the Wireless World, and has been active in the design and construction of new AM radio receivers.

NEW YORK—K8K has been active in various parts of the state. He has been a frequent contributor to the Wireless World, and has been active in the design and construction of new AM radio receivers.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BV—SEC; BHY; RM: DW; PAM: DX8; WMN meets on 4550 kc. at 7 p.m. Mon. through Sat. at 10:00 AM. MEETINGS are covered by MPN, MPN handout messages during February with an average attendance of 15.38 stations and an average of 1.16 messages per session. The Annual Spring Meeting of the Mar. Net will be held Sat., May 14, at Grandview Hall, 21 Grandview Ave., Worcester, beginning at 1 P.M. Registration is $5 at the door, dinner on an individual basis.

Continued on page 156
Satisfaction IS OUR MOST IMPORTANT PRODUCT

DELUXE
MODEL TB-3B

YOU ARE ASSURED of complete satisfaction when you buy from Hornet!
- YOU MUST be satisfied with the quality of material and construction.
- YOU MUST be satisfied with the performance of the antenna.

Cash Price
$99.75

Model
TB-3

Budget Terms
Only $9.90
Per Month
Rated 1 KW
Has Adjust-A-Gam*
Feed System
*Pat. Pend

AND
IT'S SO EASY TO BUY

- Use the order form below
- Check the model of your choice
- Mail coupon

Your antenna will be rushed to you for 'try-before-you buy' evaluation.
Thousands of amateurs who have used this plan have found that there is no better way to investigate value in relation to cost, before buying.
If you desire, use time payment plan—low monthly payments.

HEAVY DUTY
MODEL TB-600

Cash Price
$59.75

Budget Terms
Only $5.95 per Month
Rated 1 KW

MODEL
TB-500

Cash Price
$49.95

Budget Terms
Only $4.70 per Month
Handles 500 Watts

ALL MODELS . . .
- Are Pre-tuned and Easy to Install
- Have Custom Fittings of Cast Aluminum
- Use a Single 52 ohm Coaxial Transmission Line
- Have completely weather-sealed Frequency-Dividers*
- Have 6061-T6 Aluminum in the Elements

*Pat. Pend. Prices subject to change without notice

MAIL YOUR ORDER TODAY — NO MONEY REQUIRED WITH ORDER

HORNET ANTENNA PRODUCTS CO. • P. O. BOX 808 • DUNCAN, OKLA.

Please Rush My Hornet Tribander for a 10-Day FREE TRIAL. If Fully Satisfied, I Agree to Pay as Checked Below. If Not Satisfied, I Agree to Return the Beam Prepaid Within 10 Days Without Further Obligation. ALL PRICES F.O.B. FACTORY.

☐ I prefer the model TB-3B. ☐ I will pay cash within 10 days, if fully satisfied. ☐ I will pay $9.30 within 10 days and $9.30 per month for 11 months.
☐ I prefer the model TB-3. ☐ I will pay cash within 10 days. If fully satisfied. ☐ I will pay $7.45 within 10 days and $7.45 per month for 11 months.
☐ I prefer the model TB-600. ☐ I will pay cash within 10 days. If fully satisfied. ☐ I will pay $5.50 within 10 days and $5.50 per month for 11 months.
☐ I prefer the model TB-500. ☐ I will pay cash within 10 days. If fully satisfied. ☐ I will pay $4.70 within 10 days and $4.70 per month for 11 months.

NAME

ADDRESS

CITY STATE

ABSOLUTELY NO RISK ON YOUR PART
HALLICRAFTERS SX-110 RECEIVER

Every Ham should have this dependable receiver for bringing in those DX stations. Hallicrafters expert engineering and custom-designing give you a high-quality set at moderate price. Look at these important features:

- **Coverage:** Broadcast Band (535-1600 kc) plus three Short-Wave Bands (1520 kc - 34 mc).
- **Sliding-bandwidth dial covering 10, 15, 20, 40 and 80 meter amateur bands; plus 11 meter Citizens band.
- **Edge reading S meter, antenna trimmer, crystal filter, separate bandwidth tuning condensor.
- **Seven tubes plus one rectifier.** Grey steel cabinet, silver trim.

"Well-traveled" Tenny Freck (W4W1) serving the amateur since 1928.

FRECK RADIO & SUPPLY CO., Inc.
38-40 BILMORO AVENUE
ASHEVILLE, N. C.

**NEW HAMPSHIRE—SCM, Robert H. Wright, W1MNH—RMs: KH6CS and KI1PK, PAM: HQ V, VLF/ PAM: TA. The GSBN meets at 1000 Mon. through Sat. until 0600 Sun., on 3942 kc. (Ham) nightly at 1520 on 3942 kc. Welcome to new DX stations K11G and KNISOS of New Hampshire. K11AS is now General Class. The requirements for the GSBN certificate are that the operator have a GSBN certificate and have obtained at least 20 confirmed contacts with home base stations. K11D, a GSBN certificate, has been awarded to K1KBP and N23 to K1DKD. K11H, the Manchester Radio Club, held its 10th Annual Banquet, Feb. 27 with 85 in attendance. K11I, N23, has moved to New Hampshire from W2-Land, The Willimantic Conn. Jaycees presented K1GG of Manchester the Worked All Conn. Award. TA is trying to revive the old Northeast V, VLF, Net. The NBN reports 12 sessions and a traffic total of 25 for February. GSBN reports 24 sessions and 11 traffic for February. I would appreciate it if all club secretaries would let me know wheere their club officers are. Traffic: (Feb.) K1KBS 1173, K1KBU 516, CT 299, W11W 90, W11W 91, K11H, K1DKD 11, CXF 12, E I 1 12, E 1 1 1 2, EEN 5, I 1 1 5, I 1 1 5, I 1 1 5.

**RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PZM, R1M: SMU, PAM: YRC. Congratulations are in order this month to K1BBD and his X1D, on the arrival of a new baby daughter, W1LX. K1BBD was awarded W1NGC for working R, I, stations. AQ announces a new membership committee of K1PEC, L5Q and LW was formed. CL noted that the newly elected ZPT, pr., K1HZN v p p., ZPT, rds., K1JL, who recently passed the General Class exam, was appointed to the new appointed NCS of the MARS C.W. Net and R, L, representative of the MARS Army Training Net, K1JL was appointed dir. of the Eastern Area TCC. K1LSM will be leaving R, I, for Memphis, Tn., in April. R1N Net reports a total traffic of 122 messages. In 12 sessions, K1JL, K1BBD and SMU, traffic has been very slow for February but with the storm that hit R, I, the first a definite increase in traffic was noted. The PRA announces that its 35th Annual Dinner Dance will be held May 21, 1960. Contact HIK for ticket information. Traffic: K1LSM 799, W11U 678, TXL 61, TGD 40, K1BBD 29, W11W 19, W11B 10, W11A 5, K1AAV 5.

**VERMONT—SCM, Harry A. Preston, Jr., W1VBA—SEC: K1B, R: K1B0G, PAM: YRC. Various sequences; W3, 3550, phone 3955, RTTY 3020, Nets: C, M-W-F 1830; YEPN, Sun. 1730; VTPN, Sun. 0900: GAIN, Mon., Sat. 1730, WFMPC (ex-WYXK) is now living permanently in Bennington after moving from California and is running 600 watts e.v., 80 through 10 meters; 50 watts phone 75 through 6 meters. FX is now finalist for a college scholarship in the National Merit and semi-finalist on the General Motors and Hertz Foundation scholarships. FX has left the University of Illinois and is now in the New England College, Sheneen, N. Y. A.A.J. has been heard on 10 meters. K1B0G, of Rutland, has a new Globe Rossa, and K1B0G of Harland has a heart from transceiver and has an X1W, type 1 with a pair of 400s. Another new man in Rut- land is K11IV. DJW has finished building and installing a 30-meter receiver in his car. NW has been enjoying a vacation in Florida. YU is active on the other waves when the OMs and harmonics have gone.


You Asked For It... Here It Is!

COSMOPHONE "1000"

A Self-contained 1 KW Transmitter-Receiver
A True Table-top Station with NO Sacrifice of Performance

SPECIFICATIONS

TRANSMITTER
INPUT: Full 1 kw on Voice Peaks (Meters Read 2500 V at 400 ma) into a pair of 4 x 300 A’s
UNWANTED SIDEBAND: 42 db down
DISTORTION (SSB): Third order products approx. 32 db down
FREQUENCY STABILITY: Drift less than 100 cycles.
CALIBRATION: Built-in 100 kc marker
AUDIO CHARACTERISTICS: 200-3100 cps
MIKE INPUT: High impedance
VOX: Built-in
LEVEL: Automatic level control
METERING: Screen, plate, and grid current, plus RF output
RF OUTPUT: 52 ohms
VFO’s: Dual VFO’s permit transmitting on the receive or any other frequency
CONTROLS: Vox, Qt, ALC, Grid Tuning, Plate Tuning, Antenna Loading, Audio Gain, Band Switch, Meter Switch

RECEIVER
SENSITIVITY: 1 microvolt for 6 db S/N
SELECTIVITY: 3.1 kc mechanical filter plus a T-notch filter
STABILITY: Drift less than 100 cycles from a cold start at room ambient
TUNING KNOBS: Coarse gear ratio of 20:1, fine gear ratio of 100:1 gives a 1 kc dial reading per division
CALIBRATION: Built-in 100 kc marker
IMAGE AND IF REJECTION: Better than 50 db
AUDIO DETECTOR: Balanced detector for SSB and CW, diode detector for AM
MODE SWITCH: Selects up or low SSB, or up low AM, or CW
DUAL RECEPTION: Two VFO’s permit reception of any two frequencies on one band with the flick of a switch
BFO: Crystal controlled
METERING: S-meter
CONTROLS: T-notch filter, audio gain, RF gain, antenna trimming, tune selector, phone jack, tune A and B.

"The COSMOPHONE 1000"—a complete Station, Receiver, and Transmitter.
Dimensions: 17 inches wide, 12 inches high, and 15 inches deep.
Power Supplies packaged separately, can be placed under operating desk.
Price: The COSMOPHONE 1000® with Power Supplies...$1,250.00.

A Product of

COSMOS INDUSTRIES, INC.
31-28 QUEENS BOULEVARD
Long Island City, N. Y.

For additional information and dealer nearest you, write Dept. QST-5
At HENRY RADIO

We like the Electro-Voice RME6900 for

- Operating Versatility
- Operating Ease
- Precision Design
- Improved Selectivity
- Flexible Operation

The advanced design of the all-new E-V RME6900 Ham Receiver features the multi-control Modemaster Switch. This switch simultaneously alters the method of signal detection, controls the IF bandwidth, switches the IFO, and changes the AVC operation in accordance with the type of signal to be received. All critical circuitry is thus simultaneously altered and controlled in accordance with the proper mode of operation selected.

see page 119

HENRY RADIO
11240 West Olympic
Los Angeles 64, California

PREMAX EQUIPMENT

Proven For Performance and Value

<table>
<thead>
<tr>
<th>MOBILE</th>
<th>Amateur NE Type</th>
<th>$5.60</th>
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<tbody>
<tr>
<td>Type A Bumper Mounting, Chain Style</td>
<td>4.90</td>
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<tr>
<td>Type R-200 Universal Bell Mounting — Cox style</td>
<td>6.90</td>
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<tr>
<td>Type R-300 Universal Bell Mounting — Standard</td>
<td>6.90</td>
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<tr>
<td>Type SA-2 Heavy Duty Stainless Spring Adaptor</td>
<td>7.50</td>
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<tr>
<td>Type RS-300 Comb. Bell and Spring Mounting — Standard Type</td>
<td>13.50</td>
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<tr>
<td>Style BXS — Center loaded Antenna for standard frequencies — 72&quot; S. S. Whip</td>
<td>9.00</td>
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<tr>
<td>Style BSS — Same as BXS with SA-2 Spring</td>
<td>15.00</td>
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<tr>
<td>TS-896 — 96&quot; one piece Stainless Whip — taper ground</td>
<td>4.50</td>
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<tr>
<td>TS-804 — 84&quot; Same description as above</td>
<td>4.50</td>
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<tr>
<td>TS-872 — 72&quot; Same description as above</td>
<td>4.20</td>
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<td>BASE STATION</td>
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<tr>
<td>GP-430 — Light weight Aluminum Ground Plane Antenna fully adjustable from 40-60 MCS</td>
<td>30.00</td>
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<tr>
<td>GP-450 — Same as above — adjustable from 20-40 MCS</td>
<td>24.00</td>
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<tr>
<td>GP-312 — Civil Defense VHFE Ground Plane Antenna — Efficient and inexpensive — 108-120 MCS</td>
<td>4.80</td>
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<tr>
<td>GP-314 — Same as above — 144 MCS</td>
<td>4.80</td>
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<tr>
<td>GP-315 — Same as above — 150-162 MCS</td>
<td>4.80</td>
<td></td>
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<tr>
<td>Types M, AL and SS Telescoping Vertical Antennas are available in Steel, Aluminum and Stainless ranging from 12&quot; to 35&quot; in height.</td>
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<tr>
<td>Safeguard your Base Station Equipment with a Premax Ground Rod, 7/8&quot; to 9/4&quot; diameter, up to 8' in length.</td>
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<tr>
<td>See your dealer or write for catalog</td>
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PREMAX PRODUCTS
DIV. CHISHOLM-RYDER CO., INC.
6014 HIGHLAND AVE. • NIAGARA FALLS, N. Y.

to work and school, KIAJL has a new 600-watt phone signal on the air. Traffic: VIZAR/1390, WIOH 131, KHH 47, GEF 45, BGC 55, WIVSA 31, HON 30, FPS 25, KI brothers.

NORTHERN DIVISION

IDAHIO-Scm, Mrs. Helen M. Maillet, W7GCV, A surprise statewide CQ. Alert brought 30 check-ins from 23 counties to OA, at headquarters, station. Boise. All ECs and ROs should contact the sheriff or district to be put on the calling list. Then when the Alert takes place, meet on 3997 kc. for further orders. Pocatello reports four 2-meter stations on the air and new hams, are: KNTKQ, KNTKSS and KNTLCW. The Pocatello Amateur Radio Club's new officers are: KTXCQG, KTXL and KTXCGC. The Farm Net elected WEP and LIG, net controller. Thanks to retiring officers JHY and KTQJQ for a job well done. JHY will be the new director for Madison County and is mobile again with a new rig. DTC and EMT have new rigs on the air and are getting good reports. QMC is operating electronically. KVC is organizing RACES and ARED events in Moscow, Farm Net traffic: 1121. Traffic: (Feb.) W7MCG 122, K7BWY 58, W7VCC 29, CGV 21, EF 29, L7Q 19, DWE 14, EN7 19, ZQ9 9, KVP 7, JFA 9, KBY 6, DHU 5, K7GEX 1. (Jan.) W7MCG 176.

MONTANA—SCM, Vernon L. Phillips, W7PUP/WX7 — with a new position at AEC, V7QJ, the ASC, VP for the new AEC group. The new officers of the Butte Amateur Radio Club are: QCY, pres.; AEP, vice-pres.; K7EGG, secy.; and K7EDJ, treas. Hams pick up LID Jan. 16-19. EF 26. V7QJ is serving as AEC net controller. W7E7 XU will be on duty at Billings, M7L, during a 700-watt final, RHU has a new 800-watt rig. EPY is building a 2 kw. final. QCQ has a new Ranger. HDP started 1 h. N2URC was on the air in good shape. The new officers of the Butte Amateur Radio Club are: QCY, pres.; AEP, vice-pres.; K7EGG, secy.; and K7EDJ, treas. Ham picnics are scheduled for February and March. W7V2Z visited in Idaho. YLH moved from Billings to Helena, V7D moved from Billings to Casper, Wyo. K7EUB moved from Jacksonville, Fla. to Helena, Mont. V7FJ is on his way to Billings. N7L started a new 700-watt final, K7JU has a new 800-watt rig. EPY is building an 800-watt final.

OREGON—SCM, Robert R. McNally, W7DZ—There was a little slump in activity for February; too much winter snow and ice perhaps. Several antennas were foul, including that of the SCM. The Webers, K7CML and K7IUS, were on the air and had nothing to report for the month. Q woes reports that his new 455-MHz rig is about finished. We regret to announce that the two hams, K7CM and K7IUS, were not on the air and had nothing to report for the month.

WASHINGDON—SCM, Robert B. Thurston, W7PQY—The SCM, HAM, is putting out a call for members. Clubs or counties not having an Emergency Coordinator for their territory, please recommend one to your SCM or SEC for appointment. The SCM is interested in organizing a Amateur Radio Club was held at Ingham's, near Summerland. The informal officers were elected: DQP, P.9.1, QCC, VP, vice-pres.; K7C7IC, secy.; and K7DBB, gen. K7C7IC is interested in organizing a new AEC net controller. The Washington State Convention will be held in Portland, Apr. 20, and May 1. Traffic: W7BDD 382, ZH 425, K7CML 335, AXF 178, KWM7W 99, D7C 26, AJN 21, K7TWU 23, WDEIM 21, LT 20, K7CJE 6.

WASHINGTON—SCM, Robert R. McNally, W7DZ—The SCM, HAM, is putting out a call for members. Clubs or counties not having an Emergency Coordinator for their territory, please recommend one to your SCM or SEC for appointment. The SCM is interested in organizing a Amateur Radio Club was held at Ingham's, near Summerland. The informal officers were elected: DQP, P.9.1, QCC, VP, vice-pres.; K7C7IC, secy.; and K7DBB, gen. K7C7IC is interested in organizing a new AEC net controller. The Washington State Convention will be held in Portland, Apr. 20, and May 1. Traffic: W7BDD 382, ZH 425, K7CML 335, AXF 178, KWM7W 99, D7C 26, AJN 21, K7TWU 23, WDEIM 21, LT 20, K7CJE 6.
The 3-Element Thunderbird
Hy-Gain's new Standard Tri-band is the end result of an intense and thorough engineering program initiated to mass produce the mechanically and electrically finest 3-Element trap tri-band for amateur communications on 10, 15 and 20 meters. Unconditionally guaranteed to be better constructed and to outperform any other 3-Element trap tri-band regardless of price. Compare the 3-Element Thunderbird in construction, weight, trap design and PRICE...definitely the greatest tri-band at the lowest price! Overall boom length 14 ft. Longest element 26 ft.

Outstanding Features of the 3-Element Thunderbird
New stronger and lighter all aluminum construction of 2" OD booms and 1⅛" telescoping to 5/8" OD elements...New plastic and steel gusset bracket assemblies—all steel fixtures and hardware “iridine” treated in accordance with military specifications. 100% rust proof.

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Quick and easy assembly and installation from clearly written instruction manuals complete with drawings and photos.

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Unconditionally guaranteed to be completely impervious to all weather conditions. The new "solid state" slim traps are the world's smallest, lightest weight trap assemblies (⅛" in dia.) The highly efficient coil and capacitor are wound on and completely imbedded in the new low loss polypropylene plastic. Withstands Maximum Legal Power. Thoroughly tested with leading commercial transmitters. Withstand 1000 watts CW or AM and 2000 watts SSB.

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The all-new E-V RME6900 Ham Receiver features a panel layout engineered for true ease of operation. All switches have been especially selected for easy, positive action; all controls for smooth, sure adjustment; and the weighted dial knob for rapid, controlled bandspreading or precise fine tuning. These design details make the RME6900 a real delight to handle and operate.

see page 119

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Net meets on 29. 4 Mc, Tue. at 1090 PST in Tacoma. K7APJ is awaiting confirmations for his DXCC certificate. GAT renewed his ORS appointment. EYV was off the air for a sabbatical. On the morining of Jan. 31 QG1's QTH was partially destroyed by fire and Paul will be off the air for several weeks. K7ABD has a new Model 15 telescope machine and was active in the RTTY SS. QD is on the air with an Amateur Radio Club, NQ-133. W4AMZ is on 10 and running a kw, on e.w. and 500 watts on phone. FIX is very QRL with work, PANN and MARS. AMIC reports that after forty years he has obtained an old Navy mill for use in traffic work. The following stations are QRL lining out emergency gear: WQG, WRF and SFLX. Don't forget QSL from W4AMZ. Bierce for July 2 and 16 and the Bremeront Hamfest at May 21. BSW is building a new kw, with 4-400 modulators and a 4-1000 Linha. K6CNO is QRL college, LIP is QRL. KZQ's QSL is Orr appointment. KZ will be QRT for FFA School until May. SAP is the owner of a new kw, generator. K7FCC worked K6HBU on 40-meter mobile. The Kansas City Emergency Net is again on duty. On February 10, 1960 PST with NUN as Net Control Station. The Washington Amateur Radio Traffic System (WARTS) had 23 sessions accounts, 1701 check-in, and 112 pieces of traffic handled for the month of February. VI left for a vacation in Wa-Land. Clubs throughout the section are reminded that Field Day is not too far away and should plan on making a good showing for the season. QTH renewed its ORS appointment on the UN-180. K7MOQ and K6KU worked the YL Anniversary Party. Traffic: W7BA 1668, DZK 798, QRL 509, APS 183, K7 172, GYF 169, AMIC 257, K1ST 121, GQ 56, AMI 19, K7BK 48, OMC 59, JHS 38, K6CNO 58, JHBB 2, W7SST 30, ZDQ 15, JFY 11, DDQ 3, ITP 3, GSP 2.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, WVTIU—KRU continues to do an FB job as OO and reports gratifying response from notifications sent out. He's also busy checking DX on 14-Mc. a.s.f. EEF is about to join JBR, ANK, and MAH on RTTY. CIU is working DX with his Elmore beteroft, SLP still is trying to get his rig going. VIU is awaiting his WAP certificate. The XVII of HOP, in Winnemucca, is now K7RKC, K7DEE is in the air from Winnemucca, and K7MD and K7KU worked hard in the YL-OM Contest toward YL-WAS. LOH had a dip on it, and K7FM is on the air from Winnemucca. K7WMB is still in partial sporadic Aw on QTC with traffic, K7XUW is about ready to take his General Class exam. K7LTM is a new Novice in Elko; he is also the son of K7MOQ and the son of K7TMB. The NARA held a Valentine Party and continues its Fri. night transmitter hunts. Traffic: (Feb.) WVTIU 99, KRU 37, (Jan.) K7RKC 169.

NEVADA QSO ROUNDUP
May 13-15

In order to assist amateurs everywhere to obtain Nevada contacts for their WAS and/or an other major amateur Convention, the radio amateurs of the State of Nevada are holding a QSO roundup this May. This is a chance to get on the air and make a gauging up on the amateur bands the majority of hours of the state. Follows pertinent information:

Date: From May 13 to May 16, 1960 (GMT May 14), to 2400 PST May 15, 1960 (0800 GMT May 16). Object: To furnish Nevada contacts to anyone who wants one or more contacts.

Bands: Every eight meters. Modes: A1, A3, a.s.f. QSLs: All members of the NARA are pledged to QNL 100 or more contacts during this roundup. If any difficulty is encountered obtaining QSLs, drop a note to C. A. Rhines, WVTIU, SCM, Nevada box 1012, Elko, Nevada. Calling: Nevada stations will call CO and sign "DE NEVADA WVTIU" on c.q. line. How to make a call: This is Nevada calling, WVTIU. Stations wishing Nevada contacts call "QV Nevada" during the roundup.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6XK, SEC; W6GJ, PAC; W6ZU, RM; W6PLG. The Palo Alto Amateur Radio Club, meets the 1st of the month at 8:30 P.M. The Menlo Park Civic Center. Planning an active program are the new officers, W6LQ, pres.; K6XK, sec.; W6GJ, treas.; K6XK, sec.; W6CL, WMBC, secretary; and W6GJ, treasurer. The SCAARS held its annual auction Feb. 22. K5JU is in charge of the SCAARS Field Day Planning. The Pacific Division Convention, (Continued on page 149)
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*The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of two times average or more, depending upon individual voice characteristics.

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and we'll furnish it factory wired and tested for an additional $15.00.

(See back cover of this QST)

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SACRAMENTO VALLEY—SCM, Jon J. O'Brien, W6GDO—Asst. SCM; William van de Kamp, W6CKY, SEC; K6RKM, RM; W6CMC, PAM: W6GZ and W6PDO. New appointments: K6GFI as W6(PORT) and K6OFT as W6/OS.

The Gold Canyon Chapter of the American Radio Relay League (ARRL) is sponsoring a pre-Labor Day Convention on August 28th and 29th. The event is open to the public and will feature various amateur radio demonstrations and exhibitions. The exact location is yet to be determined. Details will be announced soon.

(Continued on page 144)
THE NEW COLLINS KWM-2 TRANSCEIVER

Distinctive modern styling and easy mobility make the lightweight KWM-2 an attractive unit for the CAR BOAT AIRPLANE or fixed station.

Featuring operation on all bands between 3.4 mc and 30 mc on either voice or CW, the KWM-2 has the quality and performance of the time-proven KWM-1 and famous Collins S-Line.

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<td>$262.00</td>
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<tr>
<td>351D-2 Mobile Mount</td>
<td>$110.00</td>
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<tr>
<td>351E-4 Mounting Tray</td>
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<td>516F-2 AC Power Supply</td>
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HOW TO USE GRID-DIPPED OSCILLATORS by Arthur E. Dickey. The first and only entirely to grid-dip oscilators tells you how to construct and use this very versatile instrument with building plans and complete directions. They are useful to service technicians—radio amateurs—laboratory technicians—students studying electronics and many others who must use this type of radio receivers and transmitters, also to television receivers. The grid-dip oscillator is a troubleshooting tool which may be used as a frequency measuring device—applicable to circuits and components in circuits—to antennas; also a signal source of various frequencies.

#224, $2.00

MOON BASE—technical and psychological aspects by Dr. T. C. Helvey, (Principal Biophysicist Research Lab. Radiation, Inc.). Before the first U. S. landing can be sent to the moon, it will be necessary to build on earth a Moon Base prototype (test chamber . . . 70 ft. diameter) suggested to simulate moon environment and reproduce all the stresses under which humans will operate.

This book provides a technical description of the features of a Moon Base prototype and an psychological analysis of the resultant operational crew composition. Most reading for all contributing to space flight. #205, $1.95.

PRINCIPLES OF FREQUENCY MODULATION by B. S. Comies. Written at the intermediate level, it suits the needs of the radio engineer, student of engineering and laboratory technician, this book is a comprehensive reference on the basic principles of frequency modulation and its uses.

Contents: Basic Principles of Frequency Modulation; Theory of Frequency Modulation; Frequency Modulation vs. Amplitude Modulation; Principles of Frequency-modulated Waves; Detection of Frequency-modulated Waves; F. M. Receivers—Non-bronchos—Applications F. M. #223, $3.50.

HOW TO USE METERS (2nd edition) by John F. Rider & Sol D. Prensky Engineers, laboratory and service-technicians—everyone who uses meters in their daily work—will find this revised, expanded and modernized version of the fabulously popular original text absolutely indispensable.

Everything that is new in meter instrumentation will be found in this book. For example, in addition to the many types of conventional d-c, high frequency a-c and modulated type VTVM, the digital voltmeter is also discussed in full detail. Also included is a complete description of the Sparrington ARC Its high sensitivity, electron tube vacuum tube voltmeter, transistor voltmeter and industrial transducers for voltmetors. Each step in the construction and operation of all types of electrical meters explains how to make measurements. #144, $3.50.

UNPLUGGED IDEAS by Victor J. Young, Ph.D. (abridged reprint). This is a basic yet vigorous discussion at the intermediate level of the fundamentals of microwaves, their generation, transmission and application. #197, $3.50.

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SAVANNAH VALLEY—SCM, Ralph Sarayon, W6RJU; New appointments: KS9G as EC for Kern County, K4SWW as EC for Stanislaus County. I may be repeating myself, but the Fresno Amateur Radio Club’s Annual Hamtest is going to be held at the Town & Country Lodge in Fresno May 14, 1960. The test price is $3.50 and this promises to be an excellent affair. The main prize is to be a Drake 3A receiver. The North California ARRC is going with plans, with their "jingle bells" along with QSOs, v.h.f. chatter, and other talk. Come one and come all. K3IFZ has a new HT-32 75 meters. K3DZP has moved to Cleves from the Coast. W9FXY has a new Novomatic receiver. The Fresno AR Radio Club still holds code and theory classes every Monday, at 8 p.m. It is doing its thing, and building a new mobile rig for its new Olds. W6JFW is on the air. One of his ancient 30TTL final tubes while tuning up, he opened his eyes, he has a new kenwood ht-200 on the go, s.s.b. with a 20A and CG 8876. W6FRP is on RTTY. W6UK is working out on 20-meter s.s.b. with good results. Activities seemed to be a little on the slack side in February.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RH—PAM: DHC, V.H.F. PAM: ACX. From time to time during the past four years I have earnestly requested clubs and amateurs to contribute something to this activity report, but it is very seldom that I get any reports. Twice in four years I have had letters criticizing what was included in the section happenings. Each time I have replied to the individual setting forth the need of the SCM and requesting that they send me some information about their club or amateur activity of general interest to amateurs within the section. In neither case have I heard from these individuals again. I might point out that getting is much more than the material for the report—getting is not the fulfillment but it is not of general interest. Almost every amateur has a call book and note your call. Working DX is no longer a real challenge to the normal ham. However, it is news if you work one on 2 or 6 meters. The job of the SCM and SEC is communications; therefore, you have a job to report. Get the booklet, Operating an Amateur Station 4th Edition. ARRL, and look up the responsibility of the elective officers and those appointed to you will have a better understanding of what ARRL expects from us. I need a good r.v. operator to take the job of Route Manager. Anyone interested, drop me a line. PNM did a good job but had to quit because of other duties. BAW, EV and FQG report a total of 2570 messages handled. GXR and BBZ continue to handle their port.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4QQV—SEC: K4PEE; PAM: K4HIE; RM: K4AVU. The annual Fall DX Convention held the weekend of October 29 and 30 at the Knights of Pythias Apartments in Charleston, held the annual meeting at the Knights of Pythias Apartments on October 29 to outstanding amateurs participating in "Hurricane Gracie" operation. A business meeting of the Club was held on a new net manager was elected to succeed K4TPI, who has done an excellent job for the past year. K4VZ has earned his net certificate (Continued on page 146)
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VIRGINIA—SCM: Robert L. Follmar, W4QYD—SEC: K4ANG, RAI: SII. K4RCA, K4KNP, and K4EZL. PAMS: BGP and ONY. Section nets: VBN, 1830-2000 on 3810 kc.; VN, 1900 and 2200 on 3800 kc.; VYN, 1800 on 3835 kc. There is much Norfolk daytime mobile on the VFN frequency. K4JKK, net of VN, reports 88 sessions with traffic 710, QNI 903, BGP, mar. of FN, reports 29 sessions, traffic 322 KBM 180, 72 messages handled at one session! K4QIQ says, "Have missed only one traffic report in about 2½ years," K4- IQK’s VQ. K4RCA K4J have Raults is using a small bell over laying information to the section. K4JKK is sagging for RTTY (mostly MARSH, CXCQ 100, DXXC,WAC and go), confirmations on 145.3 ac and 144.3 mc, also K4QIQ, K4IIE, and WBCN. K4AIJ reports activity on 510 mc. Thanks for all the nice words on your new SCM! RX, in sending in a traffic report, says, "This is the first one I’ve sent in in over 6 years." Almost forgot it! Up Richmond way K4J reports activity in the QCWA Party, DX Tests and the YL-OAF Phone Party. K4AUE, G4C and EC, has RTTY and 5-bw, now fired up. Incidentally, are you an EC or AREC member? It might surprise you how pointless this membership is, and what good you can do for your community by "jumping up." See K4MJJZ, K4EUS has a new 68-ft, home-built wood tower and is using it for 2-meter work. K4LJR reports that he has been handling traffic on March 18th and that the Tidewater Mobile Radio Club is now incorporated. For our QO in Falls Church, I had a bang-up month with 19 violations noted. QOL is taking a "breather" while he builds and rebuilds. Traffic: (Feb.) K4GRF 784, K4NP 629, W4QYD 428, K4KIQ 386, M4XV 319, W4Q4A 274, DYT 220, K4MLZ 219, SOQ 133, W1AQ 149, K4QEO 77, JKK 71, W4XCO 46, HNE 54, 4PM 51, BGP 49, YL-OAF 40, K4LJR, 31, A6 26, W4XQ 25, K4KIQ 21, CWTP 20, GOF 12, OMY 12, AAD 8, K4IIE 8, K4QIQ 7, CHA 6, W4LX 6, K4TUE 5, (Jan.) K4S5SA 41, WIOOL 37, BGP 19.

WEST VIRGINIA—SCM: Donald B. Morris, W9JN—SEC: H.EA. PAM: K4BIB. RAI: GDF, K4HID, PBO and VYR. The WTV C.W. Net meets on 3850 kc. at 1900; Phone on 3850 kc. at 1930 and 1830 EST. It is with regret I report the passing ofMgr of Clifton. John was a former PAM and SCM of W4A. JUE, work-

ing in Lynchburg, mountains skied with his father. PNR in Charleston. CHP has moved to Malden. Winners in the recent West Va. QSO Party, sponsored by the Kanawha Radio Club, were: WIN: PBO, K4HID and K4- AEN; (phone) WEQ, K4JSY and K8HTS. K4AEN has a nice 80-90, K4L6P made BPL again. K4ARA, K4JVF, K4JSY, K4MOH and WUB may be found around 8800 kc. to give you a W.Va. YL contest; NTV sponsors code and theory classes at Milton. A. H. SCC, K4AEN has a new SX-101A and operates around 3720 kc. K4L6S is very active in MO monitoring, SSA will represent the East River ARC on the West Va. Hamlet Committee.

(continued on page 148)
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The West Va. Hamfest will be held at Jackson Mill July 9 and 10, 1960. UHK is active on 7MHz phones in Barbour County for WACWY hunters. Morgan and Doddridge Counties still remain hard to work. Traffic: KH- N27K, OX 192, OX 171, WVE 3, WHLEX 61, WREEL 75, WSCR 28, WSCCR 10, KSJPW 10, KNCX 5, WSDFC 4, KNSFO 3, KSASX 2, OEQ 2, WS0IV L.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Carl L. Smith, WS0DZ—Asst., SCM: Howard N. Elridge, K8DCW, SEC: N. L. Hickey, FDK and WMW, PAMs: CXW and LVR. Attention is called to the appointment of K8DCW as Asst. SCM. Howard will assume duties this summer while BPL, QRT, K8RTL, at age 41, received appointment as ORS and is believed to be the youngest trailer to hold regular responsible duties between the age levels.


DUFT—K8DFU is the MARS station at Ft. Carson and reports that the Springs Peak Amateur Club (SPARK) was organized with 22 members. The Abbey High School club station, YOK, is active on ION and CCW with C11, J1NE and K5EN YQK and YPQ, is Field Day month—challenge another club for the high FD score. Don't forget the annual DRC Hamfest in July. ANA's perfect 3-year QNI record on QWNN ended in February, Congratulations on a fine record of public service, K8QD, ANA, YQ, RTT, QGO and FCC made the KDFK Trailers: (Feb. 1) WZGF 10, ANA 367, KDFK 127, EQ 346, W2MEQ 372, WME 344, YQ 237, K8RTL 235, QGO 159, WATAH 145, W2MEQ 118, K8DKF 103, K8BJ 90, DCW 60, FAM 46, WMF 31, KB8FV 49, W2CRH 20, FVE 15, A1 15, K8AKM 10, WBPG 8, K8KLCZ 1 (Jan.) K8FCC 514.

UTAH—SCM, Thomas H. Miller, W7QW—Asst., SCM: John H. Sampson, 70CZ. The Ogden group now has 4- and 6-meter sets. The 4-meter set meets Weds at 2000 MST and the 6-meter set Sat. at 1200 MST. MU has completed six months of active duty training and was honor graduate in his radio class. POU was busy with the DX Contest, Utah is planning a QSO Party in late July to help the fellows get that much-needed Utah QSL for WAS. DLW has been active in the Idaho Weather Net and each morninged putting the information on the local BC station. This is a public service to aeronautical and motorists. There has been quite a lot of favorable comment, Trailers is holding up quite well.

V24, in India, needs Utah for QSL. He is on daily beginning at 1600 GMT on 14.05 Mc. Send your reports to the SCM on the first of each month. Traffic: W2XCS 389, W3MD 75, 45, KTHIO 35, W7QW 17, K7GUE 9.

NEW MEXICO—SCM, Newell F. Greene, K8QO—Asst., SCM: Carl W. Franz, KSZN, SEC: CIN, PAM: ZU, V.H.F. PAM: F5P. The New Mexico Breakfast Club meets Mon. through Fri. at 1500 MST of 145a. The New Mexico Emergency Phone Net meets Sun. at 0730 MST, Tue., and Thurs. at 1800 MST on 3888 kc. The Berlch meets on Mon., Wed., and Fri. on 2070 kc. The TWIN meets on Sun. at 3570 kc. At 1900, Echo Charleston Net meets at 1900 Sun. on 3900 kc. The Artesia ARC held a successful K8BT Feb. 21, operating 3-meter phone circuits on emergency power. Plans are shaping up for the State Premie this summer. Keep baskets ready and the XYL alert. K8TSC has defied the spring winds with a new tower and the Hornet hot and spinning on top. The Albuquerque 9-Meter Net b impass at 30.2 Mc. Mon. at 1900 MST. The 2-Meter Net held 2 sessions with a score at 48. Traffic: WZ8HN 545, K8MLJ 91, GOJ 99, IPX 81, W5UBW 67, KS6AB 81, W55C 47, WC 25, GB 10, KS3DA 9, LWN 6, FAT 2, WZU 2.

WYOMING—SCM, Lia D. Hanson, W7AMU—SEC: CW, W7AMU. The Pony Express Net meets Sun. at 0050 MST on 3300 kc. The Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7250 kc. for traffic. The YQ Net is a w.r. net on Mon., Wed., and Fri. at 1200 MST on 3300 kc. The Wyoming Hamfest dates are July 16 and 17, 1960. The location to be decided. Traffic: W7JXY 81, W7BH 71, AKG 62, W7VW 49, W7AMU 8, K7LTA 3, W7MWN 3, ABO 2, DYT 2, K7ABO 1, CRL 1, W7GLQ 1, KTHH 1, IOH 1, W7XZ 1.

SOUTHEASTERN DIVISION

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JQG. Welcome to the Hayville Amateur Radio Club, just organized with K4CXS, pres., NBGQ, vice-pres., KF7C, secy. The new club net mfr. of AENX is K4RQD. EFF, K4WMA and V7U have double sideband on 3 meters, CTX has tracked five e.m.m. on one plus a ground plane on 6 meters. The Birmingham Amateur Radio Club is sponsoring a building project to put 28 meters...6-meter mobiles on the air, if interested, contact DEE, HBQ holds 5A-Mc. W4SDC has 48 states on 56 Mc. K4CZK has a HW-410 and an XG-100 and is a new member of AENX. New ham in Evergreen is K4ATR1. CZK worked W48DHJ on 72 meters with 120 watts. We welcome PTR to AENX, K4SJY, central Pennsylvania.

AENX in Feb.: Albemarle was 100 per cent on RN 13 in Jan. Centrals to the three highest QNI on AENX in 1959:
- RLG 51, KX 193, K4KKK 236. K4RM has QN 99. YRO now is in Montgomery; Florence's loss is Mount- gomery's gain. KICL dropped the "N." There are now 85 hams in the Tri-Cities. The Musical Shows, AF4RS is conducting code classes. Traffic: W4LRG 261, K4PFM 259, SAV HM, TLJN 98, V186 84, KU 92, K4W1N 69, K4MOZ 53, K3DA 51, R1L 51, PE1H 46, W0QK 42, MI 11, ARRI 35, HTO 34, HVM 32, WCTU 29, USB 25, K4HUR 22, JGQ 19, W4W1H 17, K4TWN 12, HXH 11, JPF 10, KJ 10, W4PTI 7, K4JN8 6, C5K 6, W1C6E 4, K4HAH 4, W46YU 3, RTQ 3, K4X1 3.


The Suncoast VHF Club now has a permanent meeting place, the W. Hq. The Sunshine State Novice Net now uses 7030 kHz contact. K4FMA. New officers of the South Miami RC are K439EX, pres.; K439T, vice-pres.; K439V, secy.; K439W, sta. eng. New officers of the Ft. Lauderdale ARC are WE5J, pres.; K4JW, vice-pres.; K4J1T, secy-treas. The Florida ARC Society are WE5J, pres.; K4JW, vice-pres.; WE5J, secy-treas. The ARRL, The Orlando ARC publishes a monthly book bulletin called "The Flashlight." The editor is K4LWZ. Other clubs known to have bulletin are the Broward ARC, Winter Haven RC, Ft. Myers RC, Daytona Beach ARA, St. Pete RC and the W. Palm Beach RC. Your SCM would appreciate being placed on the mailing list for any bulletin.

We were sorry to hear of the passing of PZT. Umer held RC, ORS and OPD appointments. Fellow, how about trying to get your traffic reports and news in the mail by at least the 3rd of each month? Nine made, BPL in February. Our ARC total is up to 1092. Let's see it, 1940, Traffic: (Feb.:) W4FPF 2703, K4J- QL 792, N4LQ 650, FMA 580, K4JF 51L, 403, 148, LCD 355, KDN 281, D7, W1SDH 245, K4LB 285, K4CW 290, G18 101, W1LMT 150, K4JX 24, K4L1D 101, W4FQ 100, K4L8 94, K4IM 56, NLR 54, W1RST 95, 23C 31, K4F2T 31, K4B 22, K4WJ 22, K4KJ 19, W4S1M 17, K4BOU 13, FWG 13, W1QOK 13, K4MAIP 10, JZ 9, OUS 9, W1VU 4, (Jan.) K4JFXG, K4L1DF 25, W4EST 12, 18S 6, Q5A 4.

WESTERN FLORIDA—SCM: Frank M. Butler, Jr., W4RKR—SEC: H4K, PAM, RFAM: K4SEP, RMU: K4SEP W4RKR has several Novices about ready for Conditional Class. Chipley: LXX has been appointed Asst. RC. He is active on 60 meters with a Globe King, K4Q, Washington Co. QTH, finally got on 72 meters by hooking checks into the W. FL, Phone Net. K4N8G7 is a new ham in Vernon. Port St. Joe: The Gulf Missile Range has brought several new hams to the local ham bands. K4J3Q, R1, K4J3Q, K4MOG, K41XW, ZKP, H1W and K3CJU. Gulf Co. RC K4HZM has them all lined up to join AREC. Pensacola City: K4CNY has moved here from Tennessee and will be a big help in the FL. C.W. Net. The PCARE, headed by K4GVS, is planning a big Gulf Coast Hamfest, June 1960. Portable operation is popular here, from trying out new gear to taking 112 QSOs in 3 hours. Egin AFB: K4UBR, RM and QFN net mfr., is moving to a new QTH and will be QRT for a while. ATX will have him QRT in a couple of weeks. Basington summer on 3500 ke. Give it your support. Pensacola: The PARO and the VHF Club joined to set up a fine booth at the 1100 Hollywood Show. SRG, P4W, VYN, EPH, KJ4Q, P4W, DDD, SWQ, SOI, LQC, BET and K4OJ were active on the Feb. Sports Car Rally, K4BBS is serving as liaison between the C.W. FLs, K4HJ, W4HJ, JF and D3J. Parrot Net. HJZ, P4Q and W3KK gave talks on AREC and ed. at the last PARCO meeting. Traffic: K4UBR 408, CNY 70, K3CM 28.

(Continued on page 158)
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GEORGIA—SCM. William F. Kennedy, W4CJF—SEC: PAJ, PAMS: LXE and ACH, RM; LDY, GCEN meets on 3081 kc. at 1830 EST Tues. and Thurs., 0900 Sun. and Mon. through Sun., and Wed., 1930 Thurs., 1930 Wed., and 1930 Wed. DDY as NC; GTAN Sat. at 1000 EST on 7260 kc.; 15-meter Mobile Phone Net each Sun. at 1530 EST on 3086 kc. across the State; ATV 10-meter Phone Net each Sat. at 220 EST on 29.5 Mc., WKC as NC; GPYI Net each Thurs. at 1300 EST, KONL as NC, GAN on 7165 kc. at 1800 EST Mon., through Fri., K2KZP as net mgr. The flu bug hit many of our members of different nets and therefore held down participation. 4-KMH made BPL for the third straight month. All is still in Florida. 4-KKYPM reports the club had the film on Solar Battery shown to them during the month of Feb. Many hams operated around the clock during the month as the bad ice storm in Georgia. Among those who owned many hours were K4A4F, UUH, YEK, TJS, LMQD, DX4, B7, K4CJQ, K4QVY, KC4PDA, K4CBM, K4AVY, K4BB, FIZ, K4BA, K4ZLS, W4ZJF, K4BFA, W4R, K4AO, MZO, K4UDE, K4CQ, K4ON, operating and M4JQF, ZUF and PBB. On Mar. 7 another snow storm hit Georgia and many of these were back at it again furnishing at Balloon Heights, BH, were members of GA. RACES and ARRC. Air Force and Army MARS, Georgia Cracker Emergency Net and GSN did a splendid job on 2300 keeping our emergency net going. Many OMs got cold sippers while their XYLs handled emergency traffic. Traffic: W4WUL 429, K4PI 396, WP5Q 284, W4JST 240, K4TSM 225, K4SAP 195, MIH 116, I4E 43, RYD 38, DLB 19, BKY 5, WZTJ 5.

WEST INDIES—SCM. William Werner, K4PDJ—SEC: AAA. API received an OFS appointment and reports his amateur radio display at his school's Science Fair was a great success. KD worked 51 QCWA stations and 21 YLs in the YL-OM Contest. KD made 476 contacts in 47 states in four hours of broadsiding in the WCX Contest. LL made over a thousand contacts in the CW, DX Contest. KD received a special citation from HDS for QSL from 250 YLs and another certificate from the Southeast DX Club of Atlanta, Ga., AGO and AT7 both moved to the Los Angeles Development near the airport. AOQ has his Mosley Tribander up, while ATM is building a tower for his beam. LY, ex-police radio now with Federal Aviation Agency, is working with W4AJS and the YLs were in San Juan on the way to a St. Thomas honeymoon. AIS is tape-recording amateur interviews for VOA. AAN is on 50 Mc. with a new Viking Thunderbolt. AQ7 acquired a General Class ticket prompted celebration by forty 6-meter friends at AAN"s QTH. AQ7 used a Hifinder on 6 meters and built an Apache and an SB-10 for use on the lower frequencies with a vertical antenna. AMG is the new owner of RM's Globe King, and WLU will warm up RM's sphere, and Mohawk while RM is building a new home. AMG is very happy with his new Globe Scout Deluxe on 6 meters. LL added a BC-443 Q5-er to the HRO, LY, APX was active on 6 meters during the YL-OM Contest, AYJ restored ATZ's Challenger on 20 meters, and WRL on 10 meters had 12 QSOs in the standby position. SSBnor 50 meter also works 15-meter W5N. AMV has a new Tecra G-50 6-meter converter and 4-meter beam. The PRAC's Annual Hamfest and election of officers was held Mar. 29 at the Colochrome San Jose in Rio Pintaras, NY is in the school's club call; AOD and AGO are teachers there.

CANAL ZONE—SCM. Ralph E. Harvey, K2PJS
The Civil Defense station at Balloon Heights, BH, has received some new equipment, a Viking Valiant transmitter and an NO-36S receiver. This equipment has been checked out on the new Triband beam and has been sending 8-9 reports from various parts of the States. The members of the Crossroads Amateur Radio Club have sent quite a bit of time promoting new stations and de-serve a big hand for their efforts. The licensing authority at Quarry Heights has announced that line will work the additional 30 kc. on the 20-meter band recently granted by FCC. the Canal Zone amateurs are permitted like operation effective Apr. 1, 1960. RM again is going to the States of New Hampshire. HML is back in California in July. Rumor has it that CT had a crew of miners; new home; FG and GM. Traffic: K230A SB-40, SB 88, SW 78, AD 69, V4E, B4E, LL 21, H4Q, MAI 18, UR 18, CE 12, CC 2, VR 1.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM. Albert F. Hill, Jr., WA4BQF—SEC: WELP, RAIS: W6BH and K4LHR, PAMS: W6BUK and W6ORS. The following stations earned BPL for the month of February: K4GJJ, K4TV, K4LHR, K4LVR, K4HRL, K4MCA, W6ZJ, K4EWA and W6EWO. Congrats, fellows! W6GBH handled traffic for the

(Continued on page 144)
NEW! LAFAYETTE HE-15 CITIZENS BAND
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Alaskan Fur Rendezvous. Nice going, Cavi! K5WAIH is putting on a kw, with 250THS. W6ZLB puts up a new 20-meter Telrex beam. K6FLW is on chases after a traffic accident. We all wish you a speedy recovery. W6WEB has a new transistorized 1-Mc. oscillator, W6NAA would appreciate information on 400-Mc. ham-TV. W5GGM has received his General Class license! K5WAIH put on the 4-250A final at 1 kw. W6A6FY has a Circle quad working fine. K6COP put in forced-air cooling on it: works fine! W68EJ is hitting the road north regularly. WA6CJR is keeping schedules with her brother, who is W6MLU. K5GLS/6 is sporting a new violette and an ARRL certificate. Congrats, Jerry! W6AM is using a Johnson-Pacemaker and a Thunderbolt on s.s.b. W6QIV is working some fine DX. W6CQO and W6FXR are having a big time on 2 meters, K6QIV is taking a new job. Best wishes, Tony! K6LTO was busy monitoring the DX Test. W6BP got up a new tower antenna. W6FSS is still working on the 420-Mc. gear. W65FX is on s.s.b. with a GSX-100, as is W6BBX. Support your section nets: On c.w., the Southern California Net, which meets at 1000 PST daily on 3800 on phone, the SoCal 8 Net, which meets at 1000 PST on 56.4 and 55.0 Mc. daily. Traffic: (Feb.) K6PQ 1053, W6GVP 1051, K6LVR 245, K6WAH 345, K5RIG 344, K6QJJ 340, W6B7J 370, K6JE 644, W6MBD 330, K6XCF 330, W6B4R 325, K6CGL/C 325, W6BTH 320, W6QE 197, W6RFP 107, K6KET 30, K6EYY 26, W6QIV 21, K6KSX 15, W6USY 18, W6CT 14, W6BHK 13, W6OHHM 13, K6OLV 10, K6VEC 9, K6CDW 8, W6AAYF 6, W6QIV 6, W6B8E 6, (Jan.) W6OWZ 6.

ARIZONA—SCM, Cameron A. Allen, W7OIF/8; SEC: CAF, Pam CSN 3889 ke: FAIZ, the Tucson AREC Net, on 3800 ke, now has 21 check-ins. Phoenix Area clubs held a joint meeting or secretariat with all members present to see a demonstration of antennas by Hy-Gain. The TAA Club provided communications for a sports car race at the Der Inn motel, MDD, OAS, and NGA on s.s.b. Traffic: W7AAM 49, D3I 35, K7CET 27, W7OIF 29, CAF 6.

SAN DIEGO—SCM, Don Stansifer, W6MLU—New members in Escondido are W6WKB and W6WKL, W6JEX, in La Mesa, is active on 40 and 2 meters and 220 Mc. The Escondido High School Radio Club, W6HAC, is now active on 40-meter phone with a 20-watt rig, K6BIX, a DXer in Bonita, was responsible for 76 cw calls being sent to DXers overseas during February. He also reports they have a Telrex TM-30 Triomander, K6ITO is converting an APX-6 for use on 1290 Mc. and continues to look for crossband contacts on 2 and 6 meters. The El Cajon Valley High School, W6MDM, sent another traffic report for February. W6CDD, of El Cajon, has made BPL, for the third month in a row with over 100 originated messages each month. Our SCM, W6HAC, with K6IT, San Diego City Radio Officer, visited the Palomar Radio Club meeting in February. W6LYF sent in a special report on emergency activity on the section which notes that Orange and Imperial Counties (both in this ARRL section) have no Emergency Coordinators appointed to date. Your SCM, as well as the SEC, is open to suggestions. The March meeting of the Newport Amateur Radio Society was a joint meeting with the Orange County and the Fullerton Clubs held in Santa Ana. A film on "S.S. Nautilus" was shown and our director, W6MLZ, was guest of honor. Traffic: (Feb.) W6YDKE 6099, W6KQ 382, K6BPF 371, W6CDD 234, W6M6AT 174, W6JDE 89, M6KDE 46, (Jan.) W6YDE 1139.

SANTA BARBARA—SCM, Robert A. Hemke, K6CBY—W6MSQ is pres. of the Paso Robles Radio Club. The club has started a 160-meter net for local get-togethers on the '6s, that are not regular meeting nights, for some on-the-air activity. The York Mountains Club elected new officers as follows: K6IT, pres.; K6DQF, vice-pres.; W6CDD, secy. The ECO for the Atascadero Area is K6FKE. W6DLM reports a slow month for traffic. The Ventura County Club has its roster out. The club joined the LA Area Council of Clubs when it met for the first time this year. The Point Reyes Radio Club elected ASWRF, pres.; W6LCL, vice-pres.; W6CQDF, secy.; K6QEE, treas. W6CDD and his XYL are expecting a new harmonic. A new OU and ORS, K6QSW/6, has a 75-A receiver, a 6W-5100B transmitter and a ground-plane antenna. Traffic: W6DLM 229, W6KYY 5.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W6BMG—Asst. SCM; E. C. Pool, 5NO, SEC; K5AXE, PAM; BOO, NH; K6MTX. The recently-formed Mineral Wells ARC now has 13 members and has received a notification of ARRL affiliation. The club has a code and theory class going each Thurs., night. Ten of the club members being... (Continued on page 195)
Used Equipment

Johnson Viking Antenna... $39.95
Sonar New SRT 120... 79.95
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WRL 755 VFO... 44.95
Johnson Viking Mobile... 75.00
WRL Scout 65... 45.00
Heath DX-55... 44.95
Central Electronics 600L... 395.00
Johnson Viking II (New)... 275.00
Gonset Tuner 30-40 mc FM... 44.95
Collins 32V-3... 495.00
Hallicrafters S-405... 74.95
Hallicrafters S-76... 99.50
Central Electronics SB Slicer; Q Multi... 75.00
Gonset Tuner 40-50 mc FM... 39.50
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Technical Materials GPR-90 W/Spkr... 375.00
RME 10 - 20... 49.50
Hallicrafters SX-71... 129.50
National HFS W/Power Supply... 149.50
National SW-54... 49.95
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long to the RACES group of Palo Pinto County. Congratulations to KSQV, president of the club and spark plug for all the activity. NFO says he has nothing to report from West Texas this time but he sure and watch for announcements of coming hamfests. Abilen will have one May 1. K3THR is a judge in Brownwood and has an RF e.d. set-up. K5AFX is sending a letter to all EC's in his file, requiring information. When you receive any, please answer it promptly. GY needs an outlet for Old Mexico traffic. Looks like the mouth of February was short of news as well as days. Now is the time for you to start thinking about Field Day in Convention, S.E.T., and other activities for which you will need to prepare. Please note the election notice that appears in April QST and look for a member of the League, nominating and voting for the amateur of your choice as a League Official. Traffic: K5LZ 674, WB8VR 11, W5GTL 92, K5RAB 45, ACD 35, W3LR 25, KWM 5.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—VCJ, PA1I 8, and HXK, PAM 2, were moved, from the list of Space Springs Club and TVU is the VS10-2A-2A. Bartlesville now holds its annual Novice Class school with 20 enrolled. Oklahoma has another Silent Key, HFEX, who passed away March 15. The second after two years in England, the Lawton—Pl. Sill Ham fest was one of the best with 199 registered. FFC, former SCM, is the proud owner of a brand new ham station. Judging by the program calendar the Muskogee Club must have some mighty interesting meetings. Apologies to the Chisholm Trail Club. We erroneously gave the name of the club paper as Chit-Chat instead of Roaring. K5REE has a new Apache. Two new signals are coming out of Oklahoma, K5ZSF and KNZAB. The club in Tulsa is starting a net on 7150 kc at 11:30 a.m. each Sat. The Tulsa Mobile and Northfork Clubs have been sponsoring their annual hamfest this spring. Traffic: K6US 51, GAY 236, JGI 254, BAY 256, W5TVQ 256, DHZ 210, GJLI 139, EK8 136, UYQ 79, OF9 62, BLYUX 54, W5FEC 55, IE3 30, E30 30, W5SCK 30, K5RQF 38, JOA 25, LYM 21, W5MFXI 21, K5OVR 21, W5WAF 20, VLF 16, CCK 17, K5QTV 15, KFIH 14, HZ 12, OTM 10, W5LKB 9, GQ 8, K5INC 7, BPV 5, W5MIXI 4, K5QA 4, EZM 2.

SOUTHERN TEXAS—SCM, Roy K. Egerston, W6QEM—SEC; QF6K; the new officers of the Corpus Christi Radio Club are K6EWE, pres.; K6VVE, vice-pres.; K5WQV, sec.; K5QGB, treas.; GMT, net. dir.; HQR, publicity. The newsletter is APT and K5MRJ. New calls in Corpus Christi are K5NZYK and K5KXZ. K5DAA has the "N" from his call, G7 visited with the club at Galveston and came back with some attend ance reports that should make some of the clubs in larger towns ashamed. The amateurs of Eagle Pass have organized the El Aguila Radio Club with 9 full and 1 associate member. All full members are ARRL members. Officers are K5QPR, pres.; K5K0, vice-pres.; K5U1, sec.; K5XZ, treas. Two of the members are XE5INZ and XE5IZ. Owner XE5INZ is the Sears dealer (Eagles). The club is starting a code and theory classes, K5Q0 has a new GSB-100 and contacted a K4 in Antarctica the first night. I understand the old radio equipment museum of the former Amateur Radio Club is second to none. I am looking forward to seeing it on my next visit to Houston. The permanent officers of the DX-Handers Club in Houston are XE, pres.; K6SAX, vice-pres.; K5VIA, sec.; K5VIA, technical adviser; and HUG, program chairman. The 1952 Traddie Net had 43 sessions, 177 check-ins, and 937 messages handled. How about some traffic reports? Congratulations to K5KXO on making BPL. New net certificate holders are K5GK and K5H0. It is time to begin making plans for the West Gulf Convention in Dallas in June. Traffic: K5KXO 150, W5BHO 120, AC 90, ZPD 50, K5WIC 50.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WI—Asst. SCM; A. D. Solomon, VE1DO and C. H. Hilliard, YOICZ, SEC; BL. New appointments include W3QNO/ YOICZ as an OAP. Winner in the CQ WW with a score of 5680, while runners-up were XP and AV. WL has returned from a three-week stay in England where he visited GLU, GB8AM and other amateurs. WL has a new Chuyenese transmitter. Amateur TV has made its debut in the section! More details when they become available. CI has received his CD certificate (active since 10/13). VO2LW has received his CP certificate. Members of the St. Croix Valley Club recently put on a test emergency drill for members of the St. Andrews (Continued on page 115).
FIELD ENGINEERING WITH A FUTURE

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Kiwannis Club. Those participating were ER, LT, CL, DP and AGJ. VA was elected to the Town Council at Hanford, A12H is working on 360-watt lineup amplifier. ES expects to have the DX-40 in operation during the summer, Sincere thanks to those to whom you have contributed to this column by your correspondence. A12H would appreciate your continued support during his next term of office. Trivia: VE1ADH 82, OX 29, DB 19, ES 4.

ONTARIO—SCM, Richard W. Roberts, VE8NG—The Northong ARC was active at the Hamilton Queenston Show in Toronto. Over 300 messages were handled. RWH is in Winnipeg. CFB is headed towards VE4- or VE5-Land. DQW, DF and the Norqundt Club, advises that its group is up and at it again. DEX is DXing on 10 meters. AGB and BTP were guests at the Air Cadet meeting in the Niagara Area. FDH DOTT, General Class certificate. If you have not done so now your license may expire. The London gang is hot on the LARC Award. Most of the amateurs are on their dwarf. Ten QSLs will get you your certificate. CFB, CUG and DRG were on TV recently. CFB and his XYL visited WI-Land. DQW and DYE were guests at the Niagara ARC recently. The topic was s.s.b. WSFGX also was a guest speaker there. KJI is en route to Florida. DTO is back in VE8-Land for a visit. DXZ is DXing on 10 meters. The Hamilton Club is getting ready for Field Day. CUM was a visitor to Rome, Italy. From Sorina we hear that CZE is on c.w. CCF is DXing. DYE lost his boat at North Bay and it is a fine meeting, many of the RCAF boys at the radio station took in the meeting. EAW attended the S.S.B. dinner in Oakville. SCM reports that many stations from Ontario. Your SCM and SEC were present and had a wonderful time. AR presented slides of his DX-pedition to the Dutch East Indies. S.B. reports that K8JEM, W2EJE, K2NH, K2ONU, K2JOT, K2GDP and other Ottawa Mobiles, live five of them and get the QSLs mailed with a self-addressed and stamped envelope to the DXCC entry. LTU 289 Flora St. LTU 279 North Bay hospital. Trivia: (Feb.) VE8USM 332, DPO 114, NG 502, HZM 83, HC 1, K5C 78, NO 71, TM 81, AU 68, EAM 42, RT 38, CPR 28, DAV 10, ELH 14, AMR 5, GQ 91, KI 10, AMZ 7, TD 3, (Jan.) VE8ADH 10, (Dec.) VE8ADH 3 94, HZB 189, EAL 59.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Please support your traffic net: OQN (slow-speed c.w.) on 3305 kc. daily at 1900, and Quebec on 3300 kc. daily at 1845. VE finds his QTH excellent for exotic DX on 40-meter phone and has worked 120 to date. QA is a road father again, a daughter (10th), ABE is planning a trip to Florida-Land again in July and hopes to operate from the (new) island of Miquelon, possibly with an FT9 and 50W phone. It will be emergency power as there is no regular power supply on this island. OJ finally made it up on 40 meters. WW probably came in second in the BURT fry. BB enjoyed the Florida sunshine and may be back on the air shortly. NV actually heard our call on 1510 MHz. ALO is now a major problem. Congratulations to WAZCNS/VE8, who has earned a medium for making the BPL three times. EC reports that the S.Maurice Valley gang is very active on 144 MHz. AOR has an all-transistorized all-band receiver. DJD operates with a horizontal trap antenna. JC is investigating critical band. It is thought that KUY, an active member of the local 75-meter phone gang, will be bringing back a Swedish parakeet from Florida for DL. IC is perfecting his "squelch," which is supposed to give an answer to all antenna problems. K4TVX/VE2 reports signs of BBC TV signs on 49 Mc. He is working on a 32-meter beam for 2 meters. DL is now living in New York City and hopes to be on there from time to time. Trivia: (Feb.) VE8USM 522, WAZCNS/VE8 214, VE2DR 199, EC 40, AON 31.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7TT—Thanks again to both Nanaimo and Victoria for forwarding their respective ham news sheet. A12H still hasn't got his horse built but the ham shack is in sight. The Nanaimo Club will be invading 6 meters by all reports. The Victoria Club, with W7AB having the job of the camp, will be out on a Vancouver Island phone party. The A.L.P. from Peace River, who is a ham, spoke out for amateur license plates. For forty days W7HS has tried five races and his antennas have tried the neighbors. AQD is buying a ball with one weight. AMT reports using a CR3AC Bearcat receiver. HCCN, on 80 meters, has 59 copies on a total of 399 check-ins and handled 276 pieces of traffic. AOT is the net manager. Upper coast stations in Prince Rupert and Wetuvon have heard stations and Kaulahoons have shown interest in the HCCN. The speed has been cut to 20 w.p.m. and the NCSs will soon to any speed reques. The time next set and the move and the newcomers are invited to get their feet wet at 1510 or 3600 kc. The net manager has had correspondence from VE4 re a trawler traffic net. Mayne.

(Continued on page 190)
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something will develop. MG should have his Apache. AEC fixed his receiver; now the power line noise and broadcast harmonics have fixed it good. TF and KX are going great guns on WTY. How about an HTTY net? Trafiie: VE3AEP 280, JQ 188, AE7 108, AQH 26, AEC 25, AMT 12, BDC 1.

MANITOBA—SCM. M. S. Watson, VY8VJ—The Brandon ARC will hold a banquet on Sept. 3 and 4, 1960, at Brandon. The club’s annual publication, Sparks (editor Frank Hardon, KX), is in its eleventh year. The ARRL’s Satellite is increasing in popularity with LD, editor, and TJ, pres., at the helm. TJ, popular 20-meter operator, is now in Russia, of the club. VE3AEP gave an excellent report illustrated by slides on his trip to VK and ZL. Later, at the January meeting, The Film Film ARC president HH, pres., and TJ, sec., for 1960, U.M., the University of Manitoba club station, is active again with a good signal. AI is on the air for a long time with a new transmitter. The second station on the Manitoba ARRL Phone Net, which meets just prior to the regular net and reports in to the southern section at 1900 daily, has spliced into the net business. Thanks to former SCM for a job well done. Trafiie: VE4SL 55, JY 12, VE 8, QO 6, EH 5, HS 4, IW 4, KB 4, XP 2, AN 2, GB 2, PW 2, RR 2.

SASKATCHEWAN—SCM. H. R. Horn, VESHR—JY has 200 countries confirmed. RS, whose new QTH is Indian Head, reports he visited an amateur club in Mexico but little English was understood. SCM located at Moose Jaw, SW, is working on a five-band vertical. MR and IR now are mobile. QP makes good use of the DXC-10 6-200 receiver. JY has a 12-kW mobile rig and a 110-ton transmitter. AI, now a regular DXC-10 mobile gear molder, says the Squaw Rapids Dam powerhouse in Northern Saskatchewan. AI and SQ passed their Advanced Amateur exams. EQ advises there are five active hams now in Estevan, and the town has a new TV. 75-4. EVY is out. AI and SCC are on 75 meters after a long absence. EQ keeps 14-Mc. QSOs daily. 3GS, VB, XX and GT were among those at the Broadcaster Convention at Saskatoon. QC has a new call and new Heath mobile gear. EQ also reports the Hamettes, XYLs of Saskatchewan hams, are doing good work in helping to raise funds for local projects. TQ serves lunch at meetings held the second Monday of each month and charge a small fee. Trafiie: VE3ASB 21, QC 12, EQ 8, HQ 5, IG 3, HP 4, NR 4, BO 5, BF 2, CB 2, CR 2, DE 2, GO 2, LX 2, LR 2, PD 2, PQ 2, TW 2, FO 1.

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How's DX?

(Continued from page 85)

finally poured the foundation for our new building here. Next month we start construction of the necessary antenna, arrangement of gear and rotator installation. More than likely it will be a few months before all is completed, but we may be on the air before then. SWBWT is active only on 20 meters at present but we plan for 10 and 15 in the future. . We cannot transmit s.s.b. yet (too big) and I would like to try s.s.b. here under my own call, SWBVY. "Jim is due home on a quota this December but has filed for a six-month tour extension. . . . EX-000, now harmony, has moved to Australia. . . . I hope they will confirm the call. . . ."

(Continued on page 188)
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see page 119

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TUNE TO VSWR 1.000 200-4000 MCS.

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DESIGNED FOR USE whenever extremely accurate RF power terminations are required. This laboratory type Coaxial Tuner will tune out discontinuities of 2 to 1 in coaxial transmission line systems or adjust residual VSWR to 1.000 of loads, antennas, etc. May also be used to introduce a mismatch into an otherwise matched system.

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SPECSIFICATIONS

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<tr>
<th>Specification</th>
<th>Value</th>
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<tr>
<td>Impedance</td>
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</tr>
<tr>
<td>Frequency Range</td>
<td>Model 151N 200-1000 Mcs.</td>
</tr>
<tr>
<td></td>
<td>Model 152N 500-4000 Mcs.</td>
</tr>
<tr>
<td>RF Connectors</td>
<td>EIA 3/4&quot; 50.0 ohm Flange plus adapters to N female connector</td>
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<tr>
<td>Power Rating</td>
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<tr>
<td>Range of Correction</td>
<td>VSWR as high as 2 may be reduced to a value of 1,000</td>
</tr>
</tbody>
</table>

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World Above
(Continued from page 79)

members have a rough time trying to use the first 300 kc, of the band, due to oscillator radiation and to overlapping of Channel 13. Cavity filters help on the latter, but if the TV set radiates in the 220-Mc. band, there is little that can be done about it, except to put the TVI shoe on the other foot.

Practical experience on all bands where high selectivity is used has shown that it is out of the question to tune an entire band of 4000 or 5000 kc. We can use a band that wide, so long as we know where to look for our contacts — but we can't tune it in one sweep after a CQ, and do a reasonable job of selecting for weak signals. Weak-signal searching difficulties are compounded if the band is full of wandering TV receiver oscillator bidders, or spurious products from TV signals.

Would 221.5 to 222 Mc. be acceptable? If so, W2SHU proposes that the first 100 kc. be used only for c.w. work, and the rest for phone. Another possibility is suggested by the availability of surplus crystals. Two channels that might enter this picture are 8200 kc. (221.4 Mc.) and 8300 kc. (221.58 Mc.). These two available frequencies might be a simple way of resolving the c.w. and phone frequency question. Certainly you could change from one to the other without any returning problems, and the two crystals would cost about 50 cents. Various oscillator circuits would spread the actual operating frequencies around quite a bit, and with present levels of occupancy there should be no QRN problem. Other frequencies can be presented later if need be.

The important thing is to have an expression of opinion. Please, all 220-Mc. operators, let us know what you think about this, so that a definite countrywide recommendation can be made before the summer DX season is in full swing. Do it now, and while you're about it, give us the dope on your 220-Mc. setup and intended schedules. We'll correlate this information and make it available to any interested parties, including W2SHU and the Central New Jersey V.H.F. Society.

(Continued on page 188)
E-Z WAY... TOWERS

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TILTS OVER for CONVENIENCE

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- Precision Design
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The all-new E-V RME6900 Ham Receiver provides many features specifically designed for the flexibility required in today's amateur communications. This rugged beauty boasts logging scale, horizontal S-meter, professional control grouping, all-mode noise limiting, controlled fast attack AVC, crystal calibrator for tuning accuracy, plus numerous other features found only on far more expensive receivers.

see page 119

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**see page 119**

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Anyone for satellite bounce on 432 Mc.? Even with the low power limit, the sharper beam possible might make up the difference between 144 and 432. The low noise receiving techniques now possible might put 432 into the money. W2OTA, Wantagh, L.I., is one who would like to try it.

Amateur TV seems to be picking up steam in a number of areas. How about Los Angeles? W6NAA, Box 111, Glendora, Cal.) would like information on the polarization, section of the band used, voice channel and any other amateur TV practices. Attention, amateurs with 1200-Mc. gear: Your cooperation is invited in connection with the Project Echo program at Haverford College, Haverford, Pa. Under the direction of Professor Benham, W3DBU, a 1200-Mc. kilowatt transmitter will be operating with a 12-foot dish and a low noise receiving system, in attempts to reflect signals from the Echo satellite; when it is put into orbit some time this spring. Observation of the signal by amateurs is desired. Early in May attempts will also be made to bounce the signal off the moon. Transmissions will be in the form of cued e.w., or a 5-millisecond pulse and 15-millisecond delay. Voice modulation may be tried. The antenna system has a gain of 1400 and a beamwidth of 5 degrees.

This information has already been sent to a list of amateurs known to have advanced gear. If you have not been contacted, and you have equipment of high performance for the amateur 1215-Mc. band, please send details to one of us.

Peter Arnow, Box 49, Haverford College, Haverford, Pa.

**OES Notes**

K1CXX, Auburn, Me. — Several stations on 2 in Northern Vermont and New Hampshire, and in Maine, active nightly after 1900. Most used frequencies are 144.45 and 144.9 Mc.

W3DQ, Canton, Conn. — Would like to see more cw activity on 220 Mc. during auroras. Worked K2CBA with very strong signal during excellent aurora of March 15, but heard no other stations. Received SS heard report from WSCSW, Westville, Koho, 500 miles. Signals on 90 and 144 Mc. At this time were among the strongest heard ever heard via aurora.

W3PEY, Lancaster, Pa. — Local 220-Mc. activity improving, with W3s HZU AJD CAJ KKN and JYL on quite regularly. Keying nightly with W4YSH, Oak Ridge, Tenn., at 2130 EST; no results as yet. Signals poor on K2CBA (240 miles) during winter months.

W2CIN, Birmingham, Ala. — Looking for business on 145.17 Mc. nightly at 2200 CST, except Monday and Friday.

K2GRS, Rochester, N.Y. — Worked W4L7U on 144 Mc. via reflection from Spotfire balloon Jan. 27. Is this first amateur QSO using manmade object in space? Will be trying for contacts when Echo satellite is sent into orbit, transmitting second half of each contact on 144.038 Mc.

W7BFN, Whitefish, Mont. — March 15 aurora made possible 50-Mc. contacts with W7CJB, Missoula, W7LH, Collins, Mont.; W7CRU and W7INX, Butte, Ore.; W7DI, Seattle, and W7GC, Port Angeles, and K7UUW, Kalispell, Wash. QSO with W7LH may have been first between two Montana v.h.f. stations on opposite sides of the Continental Divide.

K7QSR, Wheaton, Ill. — Some 20 stations now on 220 Mc. in Chicago, more on the way. Band is fine for duplex phone work with 144-Mc. stations.

K8MLI, Wisconsin, Ill. — Chicago area 50-Mc. net scheduled: 8-Alexander Club—Ptes. 2230, 2345, 2450 CST; County CD—Mon. 2035, 50.4 Mc. Chicago CD—Thurs. 2200, 50.54 Mc.

W6NPX, Two Rivers, Wis. — Acting as net control for Manocord V.H.F. Net, Wed., 1500 CST. 144.3 Mc. stations outside Manitowoc County are welcome to check in. Also report into Milwaukee area net on 144.66 Mon., 2000 CST.

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<th>Model</th>
<th>Frequency</th>
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<td>6VDC</td>
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<tr>
<td>C317</td>
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<th>FREQUENCY RANGE</th>
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<td>15 MC to 30 MC</td>
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<tr>
<td>30 MC to 50 MC</td>
<td>.0025%</td>
<td>$4.00</td>
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The Collins 32S-1 is a SSB or CW transmitter with a nominal output of 100 watts P.E.P. for operation on all amateur bands between 3.5 and 29.7 mc. It provides ample RF power for excellent communication on all bands.

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Note: 3.6 KC difference between the above
Calibrated FT-243 as exam. above* spec. ea. $1.29
Thin-Line FT-243—5 Met.-50 meg. to 54 meg. ea. $1.79
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NOVICE BAND FT-243 Fund. or DC-34 Freq. $1.29
80 Met. 3701-3758—Steps of 1 KC. FT-243 or DC-34
40 Met. 7150-7198—Steps of 1 KC. FT-243 only
Dbl. to 40 Met. 3576-3599. Steps of 1 KC. FT-243 or DC-34
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We like the Electro-Voice RME6900 for

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- Operating Ease
- Precision
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The all-new E-V RME6900 Ham Receiver has literally been engineered for today's highly active ham bands. It combines every feature necessary to "pull-in" that all-important signal with real S9 wallop. The RME6900 provides better than 1 uv sensitivity, exceptionally sharp selectivity, plus tunable T-Notch filtering for true QSK.

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SPECIAL XR-6 COIL KIT — $6.95
KIT OF 14 COILS FOR SIX METER RIG

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Marine & C.A.P.—All Freq. Available
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SEND FOR CATALOG — SE HABLA ESPANOL

Include 5c per crystal for postage (U. S. Only) Calif. add 4% Tax. No C.O.D.'s. Prices subject to change. Ind. 2nd choice substitution may be necessary. Min. Order $2.50.

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1342 So. La Brea Ave., Los Angeles 19, Calif.
NEW AMECO
2 & 6 METER CONVERTERS

2-METER FEATURES INCLUDE:
- Crystal controlled.
- New 6ES8 high gain, low noise, cascode first RF amplifier.
- 6UA second RF amplifier-mixer.
- Spurious and image rejection—over 70 db.
- Noise figure better than 4 db.
- Gain—over 30 db.

6-METER FEATURES INCLUDE:
- Crystal controlled.
- 6ES7 cascode RF amplifier and 6UA mixer-oscillator.
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The Ameco Converters are housed in a compact 2" x 3 1/2" x 5 1/2" 2-piece brushed copper chassis. They are available complete as kit of parts or with tubes and crystals for an additional charge. They are also available as either the "6-meter Converter Kit" or the "2-meter Converter Kit." The 6-meter converter can be obtained directly from the manufacturer or from the Ameco Power Supply Model PS-1, also housed in a 2-piece copper chassis. Power supply can deliver 60 ma at 12.5 volts dc & 2a at 6.3 volts ac & may be used to supply power to any accessories around the ham shack.

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Complete kit as low as $19.95

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Converter complete with valves and crystal for 7-11 Mc or 14-18 Mc in kit form with instructions .......................................................... $19.95 $23.95
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**CHECK THESE FEATURES:**
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- For right hand or left hand sending
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This 12V input dc to dc transistorized converter is conservatively rated for continuous output of 120 watts at 600V or 300V, or any combination of 600 and 300 volt loads totaling 120 watts.

High efficiency, small size, and light weight, plus freedom from maintenance, conserve your battery and increase the enjoyment of mobile operation.

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  - Operating ease
  - Precision Design
  - Improved Selectivity
  - Flexible Operation

The all-new E-V RME6900 Ham Receiver is designed for optimum performance in all modes of amateur operation — not just one or two. Whether your preference is operating SSB, AM, or CW, the mode is quickly and precisely shifted through one unified selector. Regardless of your operation, this rugged performer always delivers real solid armchair copy.

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Entire Staff consists of licensed hams who are instructors in Electrical Engineering in some of our finest colleges and universities.

Camp opens on August 14th and every effort is being made to have an F.C.C. examiner visit the camp to give the General Class examination on the closing date of August 30th.

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All 22 Frequencies in Stock
3rd overtone, .005% tolerance—to meet all F.C.C. requirements. Thermally sealed HCG/U holders, .1/4" pin spacing—200 pins per box. GIG drives free, add $5 per crystal for postage and handling.

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We like the Electro-Voice RME6900 for

✓ OPERATING VERSATILITY
- Operating ease
- Precision Design
- Improved Selectivity
- Flexible Operation

The all-new E-V RME6900 Ham Receiver is designed for optimum performance in all modes of amateur operation — not just one or two. Whether your preference is operating SSB, AM, or CW, the mode is quickly and precisely shifted through one unified selector. Regardless of your operation, this rugged performer always delivers real solid armchair copy.

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Receive "Ham" signals anywhere, on any set with

Model ATC-1 Transistorized Amateur Band Converter

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SPECIALIST IN TRANSISTORIZED EQUIPMENT

THE ONLY TRANSISTORIZED CONVERTER FOR AMATEUR RECEPTION ON NEW 12 VOLT AUTO RADIOS...

because Model ATC-1 is self-powered (3 penlight batteries, shelf life expectancy) and does not require a power supply. Its own power supply guarantees frequency stability—voltage fluctuations in car's electrical system will not affect it.

Simple to connect—one connection to antenna, other to receiver antenna input; only $4\frac{3}{4}'' \times 3\frac{3}{4}'' \times 4\frac{3}{4}''—30 ounces—small and light enough to be carried easily, mounted in any convenient spot in car; adaptable to any receiver—receives AM, CW and SSB on the 80, 40, 20, 15 and 10 meter amateur bands; the answer to mobile SSB listening—built in BFO plus a high degree of stability make the tuning of SSB, DSB, or CW signals a pleasure; provided with outstanding selectivity on AM phone by the modified "Q" multiplier circuit.

Model ATC-1, $79.50

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- Operating Versatility
- Operating Ease
- Precision Design
- Improved Selectivity
- Flexible Operation

The all-new E-V RME6900 Ham Receiver has literally been engineered for today's highly active ham bands. It combines every feature necessary to "pull-in" that all-important signal with real S9 wallop. The RME6900 provides better than 1 uv sensitivity, exceptionally sharp selectivity, plus tunable T-Notch filtering for true QSK.

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COMPLETE PLANS $1.

- No Stubs
- High F to B
- Very Broad
- High Gain
- Low S. W. R.
- 30 Lbs. Max.

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