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JANUARY 1960
VOLUME XLIV • NUMBER 1

CONTENTS

TECHNICAL

Hams on Ice... Robert H. Mellen, W1JID, with Fred J. Williams, W1WFJ, and Carl T. Milner, W1FVY

Mixing for Two-Meter V.F.O., S.S.B. and F.S.K.
Frank C. White, W3PYW

A Complete Break-In Unit for C.W.
Robert V. McGraw, W2LYH

A Table-Top Half Kilowatt
Ernest A. Coons, W1JLN/FOE

Some Amateur Applications of the Smith Chart
L. A. Cholewski, K6CHT, ex-W8SVK

Radioteletype Conversion from Receiver L.F.
James L. McCoy, W10LQV/AF2LQV

Two-Band Coverage with the BC-454
Yardley Beers, W2AWH

The "S.S.B. Package" Plus Stirling M. Olberg, W1SNN

3 Bands on a 12-Foot Boom... K. W. Swain, W9KPM

Recent Equipment:
Johnson Viking 6N2 Thunderbolt

New Apparatus:
Amphenol Marine-Core Twin-Lead
Esico Gunchoke

BEGINNER & NOVICE

How to Get Rid of the Other Fellow's Key Clicks
Lewis G. McCoy, W11CP

OPERATING

26th ARRL International DX Competition
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Annual ARRL Novice Roundup Competition

GENERAL

So You Want to Win a Contest!
Donald McLenon, W3EIS

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Our Cover
In QST 23 Years Ago
Feedback
Hints and Kinks
Happenings
Silent Keys
Quiz Quiz Quiz
World Above 90 Mc

YL News and Views
How's DX?
Correspondence from the Members
Operating News
With the AREC
ARRL Activities Calendar
Station Activities
Index to Advertisers
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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.

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"It Seems to Us..."

THE YEAR IN REVIEW

Bright-eyed, young 1959 is running hard (it’s a political year). He’d like to match an impressive list of amateur activities and achievements recorded in 1959.

Old Man 1959 leaves him a legacy that’s going to be hard to beat. For one thing, there’s the Geneva radio conference, a success story climaxing more than three years of work on the part of government and industry people, including the League. A kind word from President Eisenhower, two new third-party traffic agreements, new FCC rules permitting Technicians on two meters, along with other changes, four new v.h.f. records, increased Field Day activity, continued growth in the National Traffic System, strengthening of RACES, award winners—all these are part of the 1959 history book.

Topping the list is the Geneva story. For a solid four months commencing in mid-August, delegates from more than 80 nations met to examine the world’s radio regulations and discuss their numerous proposals for revision. At our copy deadline the conference is almost—but not quite—over. Thus we can only report the outlook as of the moment—the happy prospect that the Geneva (1959) radio regulations will continue provisions for every amateur frequency assignment now available in Canada and the United States. Should more definite news arrive by press time, we shall include it elsewhere in this issue.

More good news in 1959 was that President Eisenhower, on the occasion of the opening of the International Radio Consultative Committee technical radio conference at Los Angeles, April 1, sent by amateur radio a message of greetings and welcome to the delegates from all over the world. The President’s message, bestowing praise on amateurs, was delivered from W3WTE, the amateur station at the White House, which was in contact with K6USA, special amateur station at the CCIR conference.

From the White House where the amateur was in the limelight, we turn to the State Department, which announced two new third-party agreements, one of them just at year’s end. U. S. amateurs may now exchange messages on behalf of third parties with Mexico and Venezuela, making eleven countries with which our government has agreements.

Domestically, the Federal Communications Commission amended amateur rules making two meters (actually 145-147 Mc.) available to Technician Class licensees. As the year drew to a close, three amateur rockets awaited Commission decision: the possibility of Extra Class license incentives, two and six meter e.w. sub-bands, and the proposed expansion of the 20-meter phone sub-band.

That the FCC’s amateur license unit was again a beehive of activity is best illustrated by the fact that we’re now over the 200,000 mark in numbers of U. S. amateur licensees. Only eight years ago we topped 100,000; how soon will it be 500,000—or a million?

RACES also got a boost. Additional frequencies now include segments for e.w. (in 20, 40, 20 and 15) and phone (in 75, 40 and 15), along with militry-to-amateur liaison channels at 75 and 6 meters. F.s.k. is now permitted in the 6-meter RACES band. There was also a change to provide remote control above 220 Mc.

During the year, FCC made other miscellaneous changes in the regulations—for example, giving notice that it might call up Technician and Novice Class licensees for personal examination in the event of a serious violation such as out-of-band operation, lack of purity and stability of signals, or transmitter-caused BCI or TVI. State governments kept pace with the FCC amateur actions, too: West Virginia and Iowa, during the year, were added to the list of states issuing amateur call letter license plates, for a total of 45 out of the 50, including Alaska and Hawaii.

The growing number of amateur licensees was paralleled by notable gains in the National Traffic System. Setting a good example, young 1959, for the month of January, reported message traffic totals rose from 14,000 to 24,500. The 1959 Field Day will also share in the growth spotlight—more than 13,000 amateurs participated, representing a gain of 16% over the previous year. There was also a marked rise in general contest activity and award applications such as DXCC and WAS.

Taking advantage of summer propagation conditions, v.h.f. enthusiasts accomplished four new DX records. Untopped at press time: W6DQI 6-K6AXN 6, June 14, on 1215 Mc., 400 miles; W7JIP 7-W7LHL 7, July 21, 10,000 Mc., 187 miles; W6NLZ-KH6UK

(End of Available Pages)
Our Cover

Our cover this month is a “teaser,” giving you an idea of what’s coming in the February issue. It’s a front-panel view of the DC5-500, a receiver built by W1ZIF and featuring 500-cycle selectivity. Judging from our correspondence during the past year, interest in home-built receivers is running high, and we’re glad to add another suitable design to the list.

And say, people really do look at QST covers! The proof of that will be in the “Correspondence from Members” section of the February issue, where you will hear about the shocking December cover from a number of eagle-eyed readers.

Hamfest Calendar

Florida — The Dade Radio Club is sponsoring the Tropical Hamboree in Miami on January 30 and 31. Two days of activities include technical talks and sessions on DX, VHF, antennas, sidetone, and so forth. There will be contests and prizes, and a display of commercial equipment. The Hamboree activities will be held at the Miami Bayfront Park Auditorium. Pre-registration (prior to Jan. 15) is $5.00, or $1.00 at the door. The Saturday night banquet will be held at the MeAllister Hotel, and the tab will be $5.75 per person. Special hamboree hotel rates at the MeAllister are $7 for a single and $10 for a double. For further information contact the Hamboree Chairman, % Dade Radio Club, P. O. Box 101, Miami 1, Fla.

Back Copies and Photographs

Back copies of QST referred to in this issue are currently available, unless otherwise indicated, from our Circulation Department. Please send money order or check — $5.00 for each copy — with your order; we cannot bill small orders nor can we ship c.o.d.

Full size (8 by 10) glossy prints of equipment described in QST by staff members (only) can be furnished at $1.50 each. Please indicate the QST issue, page number, and other necessary identification when ordering, and include full remittance with your order — we do not bill nor ship c.o.d.

COMING A.R.L. CONVENTIONS
March 18-19 — Michigan State, Saginaw, Michigan.
May 1 — New England Division, Swampscott, Massachusetts.
July 30-31 — North Dakota State, Minot, North Dakota.

Strays

A QSL card intended for K1BQT had a long trip — from Boothbay Harbor in Maine to Raymond, Maine, by way of Oregon.

The address read K7BQT, Chief Op., Raymond, Box 7, Portland, Maine. The box address was apparently no good. There was no name. A helpful postal clerk with some ham district knowledge forwarded it on to Oregon. The Oregon people discovered K1BQT on the face side of the QSL and sent it to Raymond, Maine, where it belonged.

The Oregon ham and postal clerk W7NGW — who rescued this card — comments: “This represents only a small percentage of cards with bad addresses. Most would be destroyed. If a card is worth having printed and filling out, it should be worth the time to do it right.”
Hams on Ice

Six-Meter DX Operation at Fletcher's Ice Island, T3

After years of trying to work those rare Arctic DX stations, few of us could resist the chance to actually operate one. Our opportunity finally came about when the U.S. Navy Underwater Sound Laboratory, New London, Conn., became involved with Arctic work in connection with submarine operation under the ice pack. After talking with the boys who participated in last year's program in the far North, Fred Williams, W1WFJ, and I decided that it probably wasn't as rigorous as it might first appear, and it would give us a chance to try out some ideas on v.h.f. propagation from north of the auroral zone.

A letter to Ed Tilton, QST V.H.F. Editor, requesting information about summer v.h.f. propagation conditions in the Arctic gave us the answer that very little was known and this might be an excellent chance to learn something about it. Carl Milner, WIFVY, veteran of the Nautilus polar trip, offered his spare-time services as expedition outfitter, procurement officer, public relations man, equipment debugger, and guardian of our interests at the home front while we were away, and the project got under way. By the first of April all gear was ready and packed and I headed north with three other Laboratory people toward our destination, Fletcher's Ice Island, T3. Fred was to follow later in May.

T3 is a 150-foot thick kidney bean of glacial ice about 5 by 10 miles in size, which had been drifting around the Arctic Ocean long before the Air Force first established a camp there in 1952. Since then it has served as a scientific station and home for as many as a dozen scientists at a time, with about an equal number of supporting military personnel.

In April of this year, T3 was still under the Greenland Air Command so entry to the far north was made via Thule. Our call, KG1FN, assigned by the MARS Director, Eighth Air Force, reflects the Greenland origin and also is appropriate for the phonetics "Frozen North," later modified to "Frozen Nose." In July the island was transferred to the Alaskan Air Command since it is quite a bit closer to Alaska than to Greenland.

During the week layover at Thule Air Force Base we met some of the Greenland hams so familiar to stateside sidebanders; among them Rick DeZadre, KG1DZ, and Mel Fuhrmann at KG1BO. Here my first contact was made with home, via W1PPH and W1VP. Later during the summer we contacted Thule many times and chatted with the boys we had met on the way through.

The flight to T3 from Thule was a long one; more than a thousand miles over rugged islands and oceans of ice. T3 had drifted southwest to about 74°N, 130°W, far from its position near the pole a few years earlier. On the afternoon of April 11, the plane let down into the snowy mist and landed smoothly on the 6000-foot snowcovered runway. The camp, which was to be home for six months, looked like an oasis in the frozen wastes, a far cry from the pathetic windblown tents of the early Arctic explorers.

We were met by the entire camp personnel, including Trump, the huge Husky who turned out to greet us, taking advantage of the nose wheel to salute us in the manner common to all canines. Two of the boys held up a large banner reading "Welcome Arctic Hero." This was for former T3er Paul Adams, KN1LCP, who came to replace one of the Weather Bureau men. The temperature was 30° below but at least the welcome was warm.

After introduction to Col. Ed Feathers, the camp commander, I headed for camp to see the boys at the radio shack. The camp, a neat arrangement of 20-foot aluminum house trailers without wheels, looked very livable. One group of three trailers formed the main complex, housing the mess hall, recreation room and work room. Five others served as living quarters, and another four were scientific laboratories and the radio shack. Besides these buildings there were also a large garage housing the weasel and snow vehicle, a supply building and numbers of canvas-covered Jamesway huts. All buildings were ele-
vated on ice pinnacles about ten feet above the general ice level, a reminder of the previous summer's melt which eroded away the ice surface everywhere except under the trailers. Already the yearly task of resetting them on the level ice and blasting away the remaining pinnacle was in progress.

At the KG1DT shack, I was warmly welcomed by old-timer and chief operator Bob Olson, W7YJF, and replacements Al Creese, K5KJF and Bill Yarborough, K5DHY. The interior of the shack looked like any first-class station at home with the familiar KWS-1 and 75A-4, as well as the usual BC-610, military v.h.f. gear, and two beacon transmitters. With all the gear we brought along, it was sure to be an interesting summer. I was soon initiated into the group with a QSO with Stan Surber, W9NZZ, and sent some of the famous Stan-O-Ograms. These were to substitute well for mail service, especially after the runway melted out, when we would be completely isolated from the outside world.

The next weeks were spent setting up our Jamesway laboratory hut at the edge of the island about a mile from the main camp and getting our scientific projects going. Since the island was completely surrounded by sea ice, we had some trouble finding the edge and the extreme cold made our work quite difficult. One morning we awoke to 40° below temperature and 30° below was common, but we knew the days were rapidly getting longer and the spring warm-up comes fast. Soon the midnight sun would bring temperatures into the comfortable 30s.

Business Before Pleasure

There wasn't much time for ham radio during these first few weeks. Our project required drilling several holes through the ice, which we soon found was 18 feet thick and cold enough to freeze shut again in a few hours. Keeping the holes open was a full-time job.

By the middle of June, however, all the snow was gone and the melt season began. Water collected everywhere in ponds and puddles before overflowing into the streams carrying it down to the sea ice. A large pond behind the shack was frequented by a dozen friendly and curious seals, which in turn attracted hungry polar bears. We spotted more than a dozen of these white monsters during our stay, but only one gave trouble.

He was surprised in the camp area and chased the commander into his quarters.

After these many trials and tribulations things settled down and life was pretty easy. By the time Fred arrived in the middle of May our scientific projects were going well and we were on the air on 20 c.w. and phone with a long-wire antenna, Viking II CDC and GPR-30 receiver. The v.h.f. beams had been installed and the 6N2 fired up to automatically crank out KG1FN on 6 meters whenever possible. Soon Carl, W1FVY, reported the welcome news that he had contacted the Collins Company about our project and they were shipping us a KWM-1 on loan, to be returned if it survived air drop and rigors of the Arctic. Luckily, it arrived on the last plane of the season and we quickly hooked it up to our Telex Tri-band beam to begin our almost daily schedules with W1HPF and the Lab Club station, W1RQJ, operated by Carl. We were even able to continue our regular schedules on the Shoreline V.H.F. Society 2-Meter Net, with the help of a microphone patch by W1HPF. Fred, who had been forced to leave home to get to T3, before the runway disappeared, was anxiously awaiting news of the long-delayed arrival of a new junior operator. When it finally happened the news took less than twenty-four hours to get through via W1HPF and the next morning Fred was able to get the news firsthand via W1VP. We got so used to chatting with the boys back in the States that only when the blackouts knocked out all h.f. signals did we begin to feel the isolation of our drifting home.

Six-Meter Signals, at Last!

In spite of the fact that Carl had written to 6-meter v.i.p.s. throughout the world asking them to listen for KG1FN's six-meter signals on 50.01 Mc., and publicity had been given our project in QST and over W1AW, there was no sign of activity until May 7. At 2055 PST, several weak phone signals were heard coming from the direction of the Great Lakes. These could not be identified and faded out quickly. Nothing more occurred until late in June, when Carl reported that we had been heard in Tennessee and Florida on June 20 at 2055 EST.1 I was sure to sorry to have missed the opening but the long weary hours of fruitless operating had dulled our alertness. From that time on things started to pop and we seldom suffered the frustration of lack of activity on 6.

Word finally got to us that Jack Reich, K7LAUV, at Anchorage, about 900 miles to the southwest, had his beam toward us and was running automatic keying between 6:45 and 7:45 A.M.

1 The time of this report does not tie in with the experience of the KG1FN operators as to time of band openings in the evening hours. More information would be helpful, and 50-Mc. operators who may have heard the KG1FN signal in any areas or at times not mentioned in this article are asked to send details to ARRL.
every day on 50.08. On July 7, the first time we listened, Jack was heard weakly but apparently he could not hear us. We continued to listen for him throughout our entire stay and heard him almost every morning except during h.f. blackouts. He deserves a medal for persistence, having operated more than 150 hours before finally making the grade.

Towards the end of July, strong signals below the six-meter band and Canadian Channel 2 TV signals were heard almost every evening. Finally, on July 25 at 1830 Alaskan time (2230 CST), our CQ was answered by W9ADM, Baraboo, Wisc., giving us our first complete QSO. This was followed by an incomplete try with a VE4 in Manitoba, and a solid contact with K9HQ, New Prague, Minn. That evening WA6AXG (?) and other California stations were heard but not worked. All were phone signals; weak and mostly unreadable. Our calls on c.w. failed to attract their attention. Where were the c.w. DX hounds who operate on 50 Mc.? The next morning at 0900 a.m. KL7AVU answered our call and our first Alaskan contact was completed on c.w. with 85 signals.

Many evenings there were loads of signals just below the band, from the south, but no ham signals were heard again until July 31, when QSOs were completed with stations in Minnesota, Wisconsin and Alberta. On August 1 ten stations in these areas, and North Dakota and Michigan, were worked between 1920 and 2110 AST. DX breaks continued throughout August and early September. The total number of stations worked increased to fifty, with repeats contacts bringing the number of 6-meter QSOs to more than twice that number. Numerous attempts were made to break through on 2 meters but these failed, even when 6-meter signals were 40 over 9. The final score on 6 meters was 9 states worked, in the 7, 8, 9, 0 and KL7 call areas, plus VE1 and VE6.

We missed a rare Utah contact August 11, when a Salt Lake City station was heard with an 89 signal at 2130. Some of the contacts with KL7CDG and KL7C9N were really "ragchews" when the Alaska path opened up in the evening. Our states worked were Alaska, Minnesota, North Dakota, Wisconsin, Michigan, Illinois, Nebraska, Iowa and Montana. Utah and California were heard.

If this doesn’t seem like much of a score for six months’ activity, compared to the hundreds of QSOs on the lower bands, consider that it was all done without $F_2$ openings, yet most of the distances were over 2000 miles. It would appear that this mode of propagation, whatever it may have been, has no counterpart at lower latitudes.

Fred did most of the operating on 15 and 20 c.w. and s.s.b. and racked up quite a number of contacts. Among the more interesting was a three-way between KC4USB in the Antarctic giving a number of stationside stations pole-to-pole contact in one operation. We also made contact regularly with Chuck, W7BCJ/MM, aboard the icebreaker Staten Island, which was operating in the area at the time, and in September learned that they were breaking through the polar pack to T3. Fred took advantage of this unusual mode of transportation to get to Point Barrow where he picked up a plane back to home and family.

**New Propagation Mode?**

As so often happens, the results of our v.h.f. experience seem to raise more questions than they answer. At least we know that during the summer and early fall months a sporadic type of propagation occurs fairly frequently. Whether this is connected in any way with auroral conditions is not known. One of the problems we were most curious about was the effect of transmitting through the auroral zone. This is a circle of high activity centered roughly at the north magnetic pole and passing through College, Alaska. During some periods of auroral propagation in the states our signals were reported steady and clear without any sign of auroral growth. If this is a type of forward scatter, it appears to be peculiar to 6 meters, since we never heard signals on the 2-meter band, in many hours of listening.

KL7AVU’s signal from Anchorage in the mornings was also quite remarkable. At first, the burst quality reminded one of tropospheric or ionospheric scatter. Between bursts there was a weak but steady background. The signals ap-
By the first of October the new runway was ready and our projects completed. When we left on October 9, the 0-meter gear which had been left in the care of a new operator, K4XL, was quietly grinding out KG1FN, but the equipment was taken off the air in late November. We are planning to return to the far North in February, but expect to stay at the second ice station, "Charlie," which should be very near the pole at that time. Plans for bigger and better V.H.F. beams and full scale operation on both 6 and 2 are under way and we are looking forward to more interesting V.H.F. activity from the North Pole.

Further Comments by W1FVY

Since this article was first prepared further study of transmission modes has led to some interesting possibilities. I had been telling Dr. Mellen that I felt sure that the auroral zone held the key to the explanation, but not as originally envisioned.

Last year the December issue of Military Electronics had an article on auroral effects on communications, which showed the location of the auroral zone. A study of Harang's book The Aurora revealed the distribution of ionization in this layer to be highly concentrated at about 480 kilometers mean altitude. A reference to work of Lovett, et al., reported in Nature of September 13, 1947, showed that their tests indicated that the base of the auroral cloud reflected 40-Mc. signals, not 76-Mc. signals. The latter work was apparently in connection with sounding the ionosphere from a location beneath the auroral zone.

With these bits of information the next step was to investigate the behavior of the ionized "auroral cloud" as a mirror reflecstor. Using a chart, we laid out the position of the auroral zone and of T3. Next, we drew a line representing the locus of reflections of T3 signals by the auroral mirror. Lo and behold — this line neatly falls directly through all the areas which Bob had worked this summer.

We next used the 4/3 earth radius formula to determine how far along the auroral zone we could go before we reached the radio horizon, taking the effective height of our reflector to be about 500 km. This procedure indicated that Bob should have been able to reach as far east as the Washington, D. C. area.

One other factor which may be of significance was gleaned from the log: almost all contacts were made with stateside stations in periods of high auroral activity and within an hour of solar midnight at the stateside station, progressing westward in step with midnight in each zone.

The idea that the mode was some sort of reflection is borne out in the fact that the signals were of high intensity and showed very little "Arctic growl" or flutter. There was no auroral character reported from any of the stations worked and most reported only normal fading usually associated with $F_2$ or sporadic-$E$ signals.

Harang's book indicates the base of the auroral layer is essentially flat and may be up to several degrees wide (100 to 200 miles). When this is considered, the mirror reflection zone will be twice
this width, due to square-law spreading. The fact that no 144-Mc. signals ever got through agrees with Lovett’s findings for auroral reflection.

This theory may be verified during our 1960 winter trip to Station Charlie. A quick estimate shows that due to the more northerly location of Charlie the probable mirror zone may be limited to California, Nevada and Arizona. Areas farther east may be beyond the radio horizon. It also appears that a 6-meter station at Point Barrow ought to be able to work into the lakes region, and a station at Resolute, on Cornwallis Island in the Canadian Arctic, should be able to reach a zone extending all across the southern part of the United States. We hope we can get someone to set up 50-Mc. gear in these areas, to see if this theory can be confirmed.

Editor’s Note — Examination of the KG1FN log shows instances of the band being open, judging by the evidence of commercial signals close to the band edges, but no signals of amateur origin in the band. Other entries show amateur signals heard, but no contacts possible. This lack of success can be charged in part to the large time differences. (T3 time was 3 hours earlier than Eastern Standard, and nearly all the KG1FN contacts were made after 1830, their time.) But lack of alertness on the part of some v.h.f. enthusiasts must also be admitted. We need to keep a more careful watch for weak signals, especially c.w., and we should not let our operating fall into too-rigid patterns as far as beam aiming is concerned.

Future operation on 50 and 144 Mc. at Ice Station Charlie, probably under a KL7 call will offer fine opportunities for gathering information on v.h.f. propagation in the far North. V.h.f. amateurs everywhere are asked to be on the lookout for these stations, and to report contact with or reception of them to ARRL. Whenever possible, details of these operations will be run in QST. Late information will be put out via the Headquarters station, W1AW, and other Bulletin stations.

A possible explanation for the far-north 50-Mc. propagation from KG1FN is reflection from the base of the aurora. The auroral zone is shown here as a solid line, centered on the geomagnetic pole. The broken line shows points that are within theoretical working range, assuming a reflection height of 500 kilometers. It will be seen that the areas worked by KG1FN on 50 Mc. following this line closely, though they cover by no means all of it.
Mixing for Two-Meter V.F.O., S.S.B. and F.S.K.

V.H.F. Operation with an Existing H.F. Exciter

BY FRANK C. WHITE,* W3PYW

After missing some choice DX contacts during the last V.H.F. Sweepstakes, I decided that a v.f.o. for my two-meter rig was a "must." During the contest, I wanted to be within 10 kc. of the edge of the band, and I didn’t have a rock that close. I also wanted to zero in on a local’s frequency and work VE3DIR as soon as the local signed, and I didn’t have a rock for that frequency, and so it went. Most v.h.f. enthusiasts will have a dozen reasons of their own for wanting v.f.o., but the conventional oscillator-multiplier arrangement simply is not good enough to satisfy the exacting v.h.f. man. If I was going to plunge and go v.f.o. on two, the results had to be topnotch. Here were my requirements:

1) Accuracy in calibration, preferably to within a kilocycle.
2) Stability, better than any crystal-controlled two-meter rigs currently in use.
3) Good keying; no chirps, no key clicks.
4) Ability to use s.s.b. or f.s.k. on two, when desired.
5) Suppression of all undesired products to at least 50 db. down; preferably 70 db.

The foregoing requirements meant only one thing, mixing in the v.h.f. range had to be employed. Mixing is a technique that has been used since the advent of superhet receivers, and more recently in all transmitters designed for s.s.b. operation. It was apparent that a crystal-controlled frequency would have to be generated up near 144 Mc., with which a stable h.f. signal could be mixed to give the 144-Mc. output frequency. Several rules would be applied early in the design of such a unit. The crystal frequency should be as high as possible to eliminate unwanted harmonic radiation. The v.f.o. frequency should be as high as practical to simplify elimination of unwanted products in the mixing process. Harmonics of the v.f.o. or crystal should not fall near the desired two-meter output frequency.

Some examples will serve to illustrate the trouble that can be encountered. Let us assume that we are going to use a 13-Mc. crystal with a quintupler and a doubler to give a crystal-controlled 130-Mc. signal. To the 130 Mc. we could add 14 Mc. from the v.f.o. to give 144. But wait a minute! The ninth harmonic of the crystal (117 Mc.) when added to the second

* 2706 Harmon Road, Silver Spring, Md.
harmonic of the 14-Mc. signal (you can hardly keep it out) gives an undesired product of 145 Mc. And more yet! The thirteenth harmonic of the crystal gives you 143 Mc. This particular arrangement would give strong unwanted products every megacycle and weaker products every 500 kc. We can throw that combination out!

If we use a 26-Mc. third-overtone crystal (an obviously better answer) we make out somewhat better, but don’t forget the tenth harmonic of the 14-Mc. v.f.o. which ends up right smack on 144 Mc., when the desired output is 144.8 Mc. (28.8 X 5). Thus, as you v.f.o. up the band toward 145 Mc., the undesired tenth harmonic and the desired mixing product get closer together in frequency. There is nothing much you can do to get rid of the unwanted products when this occurs.

I was fortunate in one respect; I had a KWS-1 which seemed like an appropriate source of a stable h.f. signal. The KWS-1 is provided with several convenient test jacks, one of which can be used to “rob” a small amount of h.f. energy. The decision was made to use the 11-meter range of the KWS-1, by taking the 27-Mc. signal from the plate of the 6CL6 driver.

If you don’t own a KWS-1, don’t sign off at this point. It is relatively simple to obtain a watt or so from most any h.f. rig without a major modification. All you need to do is put a 5-µuf. capacitor in series with the plate of a driver stage providing a few watts of power, and go through a pi network to match to a 50-ohm coax cable. In the case of the KWS-1, it was necessary only to insert a BNC plug in the 6CL6 driver plate circuit test point (which already had the 5-µuf. capacitor in series with it) and build the pi network into the smallest-sized Minibox. See Fig. 1. This was attached to the back of the KWS-1. Note that the capacitance of the coax cable to the KWS-1 provides the input capacitance for the network. The coil is a small slug-tuned 2-inch job, available ready-made. The output capacitance need not be variable unless you are a bit shy on drive. In my case, I use thirty feet of coax cable and end up with ample 27-Mc. signal to drive the grid of the v.h.f. mixer at the far end.

When the KWS-1 is used in this way, the heater use for the final (fuse P100) is removed and the heaters and blower motor are shut down. When the KWS-1 is used on the h.f. bands, the pi network is left plugged in, as it has no effect on the normal operation.

The 11-meter band of the KWS-1 was used, to reduce undesired products in the mixer as much as possible. If the 10-meter band had been used and the 28-Mc. output were mixed with a 116-Mc. crystal-controlled signal obtained from the third harmonic of a 38,000-Mc. crystal, trouble would be encountered as this combination is tuned toward 115 Mc. When it is being used at the low end of the two-meter band, the fifth harmonic of the 28-Mc. signal (140 Mc.) is 4 Mc. removed from the desired output on 144 Mc. (28 + 116). Four megacycles is enough separation to keep the undesired products down pretty well, but it doesn’t provide the 70-db. reduction which was stated in my requirements as the goal. If you do not have an 11-meter output available, the 28 + 116 combination can be used for covering the lowest 500 kc. of the two-meter band, but not much more, unless you live out in the “boon dollars” where a signal 30 to 40 db. down from your fundamental won’t bother neighboring hams. The best answer is buy several crystals and cover the band in 500-ke. chunks and restrict the v.f.o. range to 28 to 28.5 Mc. The overtone crystals are relatively inexpensive anyhow.

The 11-meter range of the KWS-1 is ideal for the purpose. It covers from 26.1 to 27.4 Mc., which provides 1-Mc. coverage at two meters.

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Bottom view of the three Minibox assemblies, with components in the order shown in the other photograph. Note that copper shields are mounted across the tube sockets in the middle unit.
third-overtone crystal at 39.2 Mc. is used. The third harmonic (117.6) is mixed with 26.4 to give 144 Mc. With this particular combination of frequencies the nearest unwanted products are 157.6 (39.2 × 2 + 26.4 × 8) and the fifth and sixth harmonics of the crystal which fall at 132 and 158.4 Mc. By careful check with a 75A-4 receiver, it has been proven that there are no unwanted products with this frequency combination that can be found, when a +50 db. over S9 signal on the fundamental frequency is used as a reference.

The entire oscillator-mixer assembly is built in three 2 × 4 × 1 1/2-inch Miniboxes. The transistor oscillator (Fig. 2) is novel and is highly recommended. It is stable and settles down on frequency after thirty seconds warm up. You may have a pentode overtone oscillator circuit that gives more output than the one shown, but I doubt if you can find one more stable. In my opinion, a major contribution to the success of my unit has been this circuit. The crystal is series resonant and is part of a pi network. The grid-cathode capacitance of the 6AS6 is the other capacitive portion of the network. The output of the oscillator is only a few milliwatts. The 5-μf coupling capacitor is made from the insulated wire leads twisted together. Originally, I had planned to triple in the 6A5K (5051) stage that followed the oscillator but because of the low output from the oscillator it was found necessary to run straight through on the crystal frequency. Although I anticipated trouble with the 6A5K buffer, there was no tendency to oscillation.

The voltages of both the 6AS6 and 6A5K are stabilized, even though a plot of frequency variation with a.c. voltage change (no VR tube) shows only minor frequency change. With the VR tube installed, I varied the line voltage from 90 volts to 120 a.c. and the crystal frequency didn’t move a cycle. As shown by the schematic, the crystal oscillator and buffer are in a Minibox by themselves. This type of construction is recommended for circuit isolation. The power leads enter each Minibox on feed-through capacitors. I had 55 μf, on hand. Any similar or larger value would suffice.

The output of the 6A5K buffer is fed to a second 6A5K which operates as a tripler driving a 6300 buffer on 117.6 Mc. With these two stages, Fig. 3, housed in their own Minibox, the circuit isolation is ideal. The 6300 mixer is in a third Minibox. The 117.6-Mc. output of the 6300 buffer is fed to the cathode of the mixer. This is highly preferable to use on the screen, which has been suggested previously. Cathode injection with push-pull output nicely eliminates the 117.6-Mc. energy from the output. The cathode

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**QST for**
of the 6360 is not tuned.

The 11-meter output from the KWS-1 (about a watt) was fed to the mixer through coax cable and link-coupled to the grid of the 6360. With push-pull input and output, the even-order harmonics are eliminated in the output.

The 6360 mixer gives about 3 watts output, which is used to drive a pair of 6155S, Class AB3, at about 175 watts output. This combination, using the KWS-1 as a source of 11-meter s.s.b. signal, has provided many excellent s.s.b. contacts on two meters.

The KWS-1 frequency is varied to permit covering from 144 to 145 Mc. with only a "touch-up" of the 6360 mixer and 6155 output tuning near 145 Mc. A crystal on 39.583 Mc. is plugged in to cover 145-146 Mc. No adjustment of the tuned circuits of the crystal oscillator portion is necessary. Assuming the frequency of the 11-meter signal is correct, the two-meter output frequency should be within 5 kc. of that predicted. The crystals supplied to me by the American Crystal Company (323 Fifth St., Kansas City, Mo.) produced an output on two meters that was within 2 kc. of the predicted frequency.

Anyone who has used a mixer to produce clean signals knows the pleasure that can be expected in keying the 11-meter signal to produce e.w. on two meters. The signal is chripless and sounds more like a 40- or 80-meter signal than one on two meters. I have been most pleased with the performance of the unit described and want to pass on the information on design for the benefit of others.

**Strays**

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

**First Army MARS**

(Wednesday evenings, 2100 EST, 4030 kc. upper sideband)

Jan. 6 — The Autometer.
Jan. 13 — Antenna Multi-Couplers.
Jan. 20 — Television and the Amateur Operator.
Jan. 27 — Basics and Applications of Re-inforced Plastics in Communications Products.

**AF-MARS Eastern**

(Sundays 1400 EST; 3295, 7540 and 15,715 kc.)

Jan. 3 — Reversal date.
Jan. 10 — Review of Technical Topics.

Jan. 31 — Optics and the Visible Spectrum.

**AF-MARS Western**

(Sundays 1400 local time; 7832.5, 3295 kc. and 143,46 Mc.)

Jan. 3 — Technical Net Session.
Jan. 10 — Basic Radioteletype Discussion.
Jan. 31 — Net Session and Conversion Information with a Technical Discussion.

"Radio amateurs' Field Day is known far and wide among the radio hams as real fun, but we never saw a more serious, harassed bunch of guys in our lives."

January 1960
A Complete Break-In Unit for C.W.

BY ROBERT V. McGRAW,* W2LYH

Of one of my favorite ham radio subjects has always been break-in c.w. operation, and the different methods of obtaining it. Since descriptions of these methods have been very interesting to me, I thought that perhaps the system used at this station might be of some interest to others who have been working on the same problem. The system provides full break-in operation, in which the breaking signal can be heard between dots at the fastest sending speed, with no compromise in the quality of the transmitted signal. It uses only one antenna and gives monitoring of the keying without clicks or thumps in the headphones. Most of the functions of the system have been combined into one unit, as shown in the photographs. These functions will be described separately.

Transmitter Keying

The transmitter uses a shielded v.f.o. unit with a continuously-running oscillator and two untuned Class A buffer stages, and grid-block keying is applied in a stage which doubles to 80 meters. The local signal is absolutely inaudible on any band with the key up, so there is no need to key the oscillator, and the keying can be shaped as desired by adjusting the constants of the keyer circuit.

The blocking bias is supplied by a half-wave rectifier, $V_{eb}$, Fig. 1. The leading and trailing edges of the keying envelope are adjusted by

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* Peg's Lane, Riverhead, N. Y.

1 This requires using a low-frequency (100-meter or broadcast band) v.f.o., followed by a Class A amplifier, both well-shielded, before the keyed stage. Such a unit was described in QST for February, 1939 (Smith, "A Solution to the Keyed V.F.O. Problem").

Fig. 1 — Circuit diagram of the c.w. break-in unit. Return paths for keying, audio and send-receive switch circuits are to ground (chassis). See Fig. 3 for t.r. relay circuit. Unless otherwise indicated, capacitances are in μf, resistances are in ohms, fixed resistors are ½ watt. Capacitors with polarity marked are electrolytic; others may be paper, mica, or ceramic as convenient.

C₁, C₂—0.1-μf. paper.
C₃—0.035-μf. paper.
K₁—Fast-acting sensitive relay, s.p.s.t. or s.p.d.t. (see Fig. 3).
L₁—Audio transformer, interstage type; see text.
R₁, R₂—Composition control, linear taper.
R₃—0.5 megohm, ½ watt.
R₄, R₅—Composition control, linear taper.
R₆—Composition control, audio taper.

Stage is driven beyond the point where its output ceases to rise; it will act as a limiter and will tend to square up the keying envelope. The v.f.o. is provided with an output control, which is set at the point where the antenna current just starts to drop. This control is also used for adjusting the power output of the transmitter, giving smooth control from zero to maximum.

Fig. 2—Trailing-edge wave shapes with RC and LC circuits.

R₀, R₉—Composition control, linear taper.
T₁—Interstage audio transformer, single plate to p.p. grids (any type satisfactory).
T₂, T₃—Output transformer, plate to line type (Thordarson 22572 or equivalent suggested).
T₄—Power transformer, 125 volts at 15 ma. (Stancor PS-8415 or similar).
T₅—Filament transformer, 6.3 volts at 3 amp.

**Limiter and Keyed Audio Stage**

The audio output of the receiver is fed through a limiter, V₃, and a keyed audio amplifier, V₂, to the headphones. The limiter prevents signals from rising above a chosen audio level, and is quite useful for saving the eardrums. The keyed amplifier serves to disconnect the phones from the receiver when the key is down, so that any clicks or thumps which might be generated in the receiver are not heard. When the key is closed, V₃A conducts, and the voltage drop across R₃ and C₉ instantly biases both triodes of V₂ beyond cutoff. When the key is opened, the triodes do not conduct again until C₉ has discharged through R₃, giving a few milliseconds delay, during which time the transmitter output drops to zero, the receiver r.f. gain is keyed to normal level, and the
antenna is switched to the receiver. A push-pull amplifier is used so that the plate current can be cut off sharply without causing a click in the phones. Potentiometer $R_2$ is set to the point where the click is balanced out.

Relay Tube

The "relay tube", $V_3$, performs two functions. One triode keys the audio amplifier, $V_2$, as just described. The other has two relays in its plate circuit. One relay (Fig. 3) serves as a t.r. switch,

![Fig. 3 - Coax-line break-in relay circuit. In actual construction, a single chassis-mounting type coax connector is used at the junction of the lines from the transmitter and antenna tuner, with a "Tee" fitting for making the connection, as shown in one of the photographs. The relay is the same as the keying relay in Fig. 1; the one used by the author is a Signal Corps type BK-35, but any fast-acting relay having a 10,000-ohm coil can be used. Suggested alternatives are the Sigma 4F, 5F or 11F, Advance SV, Potter & Brumfield SSSD, or Struthers-Dunn 1AXA124.](image)

and the other, $K_1$, keys the receiver r.f. gain by the well-known method of lifting the normally-grounded end of the r.f. gain control from ground. Since there is no need to reduce the gain all the way to zero, $R_4$ is included to provide a means for adjusting the key-down gain; this gives the relay contacts less work to do, and also permits monitoring the transmitted signal directly at the receiver output if desired. It is evident from the circuit diagram that when the key is closed, capacitor $C_3$ will discharge rapidly through diode $V_{3A}$, triode $V_{3B}$ will conduct, and both relays will operate. The relays are closed before any r.f. comes from the transmitter.

While it is desired that the relays operate quickly when the key is closed, they should hold in for a few milliseconds after opening the key, until the transmitter output has dropped to zero. This action is achieved by allowing $C_3$ to discharge rapidly through diode $V_{3A}$ when the key is closed, and to charge more slowly through $R_5$ when the key is opened. The cathodes of the relay tube and the audio oscillator are returned to ground through one pair of contacts on an external d.p.s.t. "send-receive" switch, the other contacts of which control the transmitter power supplies. When the switch is in the receiving (open) position the break-in system is thus disabled, to allow spotting of the v.f.o. frequency.
A neat wiring and cabling job makes the bottom of the chassis look simple. The power transformer visible through the cutout at the lower right is a surplus item combining the plate and filament functions specified in Fig. 1 for $T_s$ and $T_s$.

**Analysis of Operation**

The sequence of the over-all operation is shown in Fig. 4. Potentiometer $R_8$ in the grid-blocking supply is provided for setting the level of the blocking bias. To key the v.f.o., it is required only that this voltage be set to a value sufficient to cut off the keyed stage. However, if we set the voltage slightly beyond this point, there will be a time interval, with proper shaping of the leading edge, after the key is closed and before there is any output from the v.f.o., which can be used for setting the system to the transmitting condition. During this period the phones are disconnected from the receiver, the receiver r.f. gain is reduced, and the antenna is switched, all before any r.f. comes from the transmitter. When the key is opened, the transmitter output falls to zero, the relays open, and the keyed audio amplifier again connects the phones to the receiver. This action is repeated for every dot and dash, giving the maximum opportunity to hear a breaking signal without the annoyance of clicks and thumps in the phones.

**Adjustment**

The nine potentiometers mounted on the panel provide the adjustments required for setting up the system for smooth operation. The first step is to set the keying bias level ($R_8$) somewhat beyond the voltage required to block the keyed stage. Then the leading and trailing edges are shaped ($R_9$ and $R_{10}$) to give the desired keying characteristics. Next, the “relay hold” control ($R_5$) is set so that the relays hold in until the transmitter output has dropped to zero, as determined by listening directly at the receiver output. If the relays open too soon, a loud click will be heard when the key is opened. $R_5$ should be set just beyond the point where this click disappears. The “amplifier balance” control ($R_2$) should be adjusted to balance out any click which might be heard at the instant of closing the key. The limiter control ($R_7$) sets a maximum on the level of audio signal in the phones, and should be set so that no clipping occurs on normal signals. The pitch ($R_4$) and volume ($R_8$) of the keying monitor can be adjusted to suit your preference, and then you are all set for some smooth break-in c.w. operating.

The only way I can think of to improve on the system would be to locate the transmitter about ten miles away, but it’s handier to have it within reach.

**Strays**

It looked like a hungry trip ahead when Captain R. J. Beach’s river boat ran out of chow on the Tahquamenon River in the wilds of Michigan’s upper peninsula.

There were 80 passengers aboard and a five-hour run to any restaurant. But the captain is W8NBJ. Operating 75-meter mobile, he called W8ZDF who phoned the captain’s XYL Mrs. Beach drove to the rescue with hamburger and buns, hiking the last part of the way to hail the boat from a deer camp near the down river tie-up.
This amplifier operates at a plate input of approximately 500 watts, uses a pair of 811As in grounded-grid, and is complete with power supply on a 13 x 17 x 4-inch chassis. The rack panel is 10% by 19 inches. Front-panel controls, arranged to give a balanced appearance, include the plate tuning capacitor and band switch in the center, filament and plate power switches with their pilot lights at the lower left, sensitivity control and forward-reflected power switch for the directional coupler at the lower right, variable loading capacitor and auxiliary loading-capacitor switch underneath the 0-1 milliammeter at the right, and the grid-cathode milliammeter with its switch at the upper left. The filter choke, 866As and plate transformer occupy the rear section of the chassis.

A Table-Top Half Kilowatt

An amplifier-cum-power supply on one chassis is a convenient package to have, especially when it fits in a receiver-size table-type cabinet and can be run at a half kilowatt input. Add constructional simplicity, a minimum of operating controls, and pleasing appearance and you have the article described here.

The amplifier shown here will run at about 500 watts input on c.w.—or p.e.p. input as an s.s.b. linear—on all bands from 80 through 10 meters. I wanted a simple amplifier that would be small and neat, and with which I could change bands quickly. The result is small enough to sit on the operating table right along with the rest of the station equipment; no need for big racks here!

Using a pair of 811As in parallel in the grounded-grid circuit, this rig is a good one to use following transmitters such as the Viking Ranger, DX-10, Globe Scout, and others of similar power class, for a worth-while increase in power output on c.w. As a linear amplifier following an s.s.b. exciter it requires no swamping not only because the 811A grids provide a fairly constant load in themselves, but also because the feed-through power with grounded-grid presents an additional constant load to the driver. The total driving power needed on any band is less than 20 watts.

An additional useful feature is a built-in directional coupler using a version of the "Mickey Match." Besides its obvious application for checking the s.w.r. on the transmission line to the antenna or for help in tuning up a coax-coupled antenna coupler, it is practically indispensable as an indicator of relative power output in tuning the amplifier, for reasons which will be discussed later.

Grounded-Grid Parallel

811As for S.S.B. or C.W.

BY ERNEST A. COONS,* W1LN/FOE

The Circuit

A number of tube types could be used in an amplifier of this power class, but I decided on the 811As because they do not need a bias supply and are not expensive. (Surplus 811s can be used if you don't want to buy new tubes; the ratings are not quite as high but they can be pushed a bit in intermittent service such as c.w. and s.s.b.)

The complete circuit is shown in Fig. 1. Don't expect to find anything startling—the whole thing was taken from parts of proven circuits here and there in the Handbook and put together to meet my needs. To save trouble and work, standard components were used throughout—the only special construction is the shielding and a few simple r.f. chokes. The tube filaments are driven directly from coax input from the driver; no tuning is used or is needed in this circuit. The filaments are kept above ground by the B & W type FC15 filament choke.

The plate tank is the familiar pi network, using a B & W type 851 tapped coil and band-switch assembly. This assembly has been modified slightly in two respects: First, the copper-strip 10-meter coil normally mounted at the top of the rear plate was taken off and moved so that it is supported between the tank assembly and the stator of the tank tuning capacitor as shown in

* 25 Atlantic Terrace, Lynn, Mass.

1 Bonne, "The 'Mickey Match'," QST, November, 1958. A modified version also is described in the chapter on measurements in the 1950 edition of The Radio Amateur's Handbook. The circuit used here combines the r.f. switching of the original "Mickey Match" with the fixed load resistor used in the Handbook arrangement, — Editor.
the top view. A short length of copper strip isolts between the free end of the coil and the
right-hand stator connection of the tuning capaci-
tor, to support the free end. This change was
made in order to avoid the long lead that would
have had to be run from the capacitor to the
regular input terminal on the tank assembly,
since this terminal is at the right-hand side of the
assembly as viewed from the top. The turns of the
10-meter coil were also squeezed together a
bit to increase the inductance, because it was
found that a rather large amount of capacitance
had to be used to tune the circuit to the band
with the coil at its original length. The length is
now 1½ inches between mounting holes.

The second modification was the addition of a

\[
\text{DECIMAL VALUES OF CAPACITANCE ARE IN \mu\text{F}.}
\]
\[
\text{OTHERS ARE IN \mu\text{F} EXCEPT AS INDICATED.}
\]

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**Fig. 1 — Circuit diagram of the parallel-811A grounded-grid amplifier. Unless otherwise specified, fixed capacitors are
disk ceramic, 600-volt rating.**

- \( C_1 = 500 \mu\text{F}, 20,000 \text{ volts (TV "doorknob" type).} \)
- \( C_2 = 250-\mu\text{F. variable, 2000 \text{ volts (Johnson 250E20).}} \)
- \( C_6 = 325-\mu\text{F. variable, receiving type (Hammarlund MC-325-M).} \)
- \( C_4 = C_5, \text{ inc.} = 1200-\text{volt mica, case style CM-45.} \)
- \( I_1, I_2 = 6.3-\text{volt dial lamp, 150-ma. (No. 47).} \)
- \( J_1, J_2 = \text{Coax connector, chassis mounting.} \)
- \( J_3, J_4 = \text{Closed-circuit phone jack.} \)
- \( J_5, J_6 = 115-\text{volt male connector, chassis mounting (Am-
plonel 61-M1).} \)
- \( L_1, L_2, S_1 = 5-\text{band pi-network coil-switch assembly; see} \)
  \( \text{text (B & W 851).} \)
- \( L_3, L_5 = \text{Swinging choke, 4-20 henrys, 300 ma. (UTC S-34).} \)
- \( L_4 = \text{Section of coax line with extra conductor inserted;} \)
  \( \text{see Footnote 1 for construction references.} \)
- \( M_1, M_2 = \text{Millimiameter, 3½-inch plastic case (Triplatt 327-PI).} \)
- \( R_1 = 20,000-\text{ohm composition control, linear taper.} \)
- \( RFC_1, RFC_2 = \text{Filament choke assembly, to carry 8 amp. (B & W} \)
  \( \text{FC15).} \)
- \( RFC_3, RFC_4 = 2 \mu\text{F. (National R-60).} \)
- \( RFC_5, RFC_6 = 90 \mu\text{F., 4½-inch winding of No. 26, 40 t.p.i., on} \)
  \( \frac{3}{4}-\text{inch ceramic form (B & W 800).} \)
- \( RFC_7, RFC_8 = 2.5 \text{ mh, any type.} \)
- \( RFC_9, RFC_{10} = \text{Ind. = 18 turns No. 14 enam., close-wound,} \)
  \( \frac{3}{8}-\text{inch diam., self-supporting.} \)
- \( S_1 = \text{4-pole 2-position rotary, nonshorting (Mallory 3242) or} \)
  \( \text{Centralab 1430).} \)
- \( S_2 = \text{Part of tank assembly; see L_1.} \)
- \( S_3 = \text{Miniature ceramic rotary, 1 section, 1 pole, 6 positions} \)
  \( \text{used, progressive shorting (Centralab 2042).} \)
- \( S_4 = \text{Miniature ceramic rotary, 1 section, 2 poles, 2 positions} \)
  \( \text{used, nonshorting (Centralab 2003).} \)
- \( S_5, S_6 = \text{Spst. toggle.} \)
- \( T_1 = \text{Filament transformer, 6.3 volts, 8 amp. min. (UTC} \)
  \( S-61).} \)
- \( T_2 = \text{Filament transformer, 2.5 volts, 10 amp. (UTC S-57).} \)
- \( T_3 = \text{Plate transformer, 3000 volts center-tapped, 300 ma.} \)
  \( \text{d.c. (UTC S-47).} \)
- \( Z_1, Z_2 = \text{Parasitic suppressor, 100-ohm 2-watt carbon resis-
}\)
  \( \text{tor assembled inside 2½-turn coil of No. 16} \)
  \( \text{tinned, ½-inch diameter, ½-inch long.} \)
pair of switch contacts on the rear switch plate of the tank assembly. There is an extra position on this plate with holes already provided for contacts, and it seemed like a good idea to use a set of contacts here to switch in additional output loading capacitance on 80 meters, where a large output capacitance is needed. The variable loading capacitor, C3, and the five fixed mica capacitors, C5 to C9 inclusive, give continuous variation of capacitance up to 1275 µf, on all bands, including the regular band-switch position for the 80-meter band. However, if the switch is turned to the extra position an additional 1000-µf. mica capacitor is connected in parallel, so that continuous variation of capacitance to over 2200 µf. is possible on 80. This takes care of cases where the load resistance happens to be unusually low or reactive.2

A 500-ma. d.c. meter is used for reading either total cathode current or grid current alone. The cathode current is read in preference to plate current because of safety considerations. Putting the meter in the hot d.c. plate lead leaves nothing but a little plastic insulation between the high voltage and the meter adjusting screw. Although the meter could have been connected in the negative plate supply lead since the power supply is self-contained, I prefer to have the negative firmly grounded to the chassis. It is a bit of a nuisance to have to subtract the grid current from the cathode current in order to find the plate current, but it isn’t serious. The d.c. grid circuit has a jack, J3, for introducing external bias either for blocked-grid keying or for cutting off the plate current during receiving, and a four-pole switch, S1, is therefore needed for handling the meter switching while keeping all circuits functioning normally.

The power supply uses 806As with a plate transformer giving 1500 volts each side of the center tap, and working into a single-section choke-input filter. The filter capacitor consists of four 80-µf. electrolytics connected in series to handle the voltage, giving an effective filter capacitance of 20 µf. This supply is running well below its capabilities in the intermittent type of operation represented by c.w. and s.s.b., and the amplifier is somewhat “over-powered” in this respect. A lighter plate transformer can be used since the average current in regular operation is only about half the maximum tube rating of 350 ma. for the pair. However, a heavier supply was used here because plate modulation may be tried some day. This might make it necessary to use a tank capacitor with larger plate spacing (3000-volt rating instead of 2000 volts, which is plenty adequate for c.w. and s.s.b.) but there is room enough to install a capacitor about two inches longer if it is needed.

The a.c. input to both filaments and plates have TVI filters installed right at the a.c. connectors. The chokes in these filters, RFC5 to RFC9 inclusive, are homemade by winding 18 turns of No. 14 enameled wire close-wound on a half-inch dowel or drill.

**Construction**

The ordinary principles of good construction as given in the handbooks were followed in layout and assembly. The only space available for the filament transformers was below chassis, so these were mounted on the front wall of the chassis as shown in the bottom view. There is plenty of room for all other power-supply parts below chassis, and the photographs make any further comment on this section unnecessary.

The r.f. layout shown in the top view is almost an exact copy of the circuit layout as given in Fig. 1. The plate blocking capacitor, C1, is mounted on a small right-angle bracket fastened to the left-hand side of the tank capacitor, C5. The plate plates are connected to C1 through individual parasite-suppressor assemblies, Z1 and Z2. The hot end of the plate choke, RFC3, also connects to this same point. The tank capacitor is mounted on 3½-inch ceramic pillars to bring its shaft to the same height as the switch shaft on the tank-coil assembly. The capacitor is grounded by connecting the bottom of its frame through a half-inch wide strip of

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2 These contacts can be obtained directly from the manufacturer of the tank assembly. To secure a set of contacts with mounting hardware, send one dollar to Barker & Williamson, Beaver Dam and Canal, Bristol, Penna., specifying the type of tank assembly for which they are wanted. The contacts are not catalog items and are not available through dealers.—Editor.
aluminum to essentially the same point at which the plate-choke bypass capacitor, a 0.001-μf, 2000-volt disk, is grounded. The ground end of the aluminum strip actually is under the bottom of the plate choke, and the ground lug for the bypass capacitor is just to the left. This strip, plus short leads in the circuit from the tube plates through the tank capacitor to ground, keeps the resonant frequency of the loop thus formed well up in the v.h.f. region: this is important because it permits using low-inductance parasitic chokes in shunt with the suppressor resistors, and thus tends to keep the r.f. plate current at the regular operating frequencies out of the resistors. With other tank grounding arrangements originally tried, larger parasitic chokes had to be used and it was impossible to prevent the resistors from burning up when operating on 10, 15 and even 20 meters. Now they do not overheat on any frequency, and v.h.f. parasitics are nonexistent — although without the suppressors the parasitics are only too much in evidence.

The output loading capacitors, C3 through C9, are mounted toward the rear so the leads from the tank coil can be kept as short as possible. A length of copper strip is used between the coil and the stator of C2; originally this lead was No. 14 wire but on 10 meters the tank current was enough to heat it to the point of disoloration. The ground lead from the fixed units, made to the rear bearing connection of C3, is also copper strip. C4 and C5 are operated through extension shafts, using Millen flexible couplings to simplify the alignment problem.

Underneath the chassis, each 811A grid is bypassed directly to the socket-mounting screw nearest the plate choke (right-hand side of the socket in the bottom view). The d.c. leads have small chokes, RPC5 and RPC9, with additional bypasses for good r.f. filtering, particularly at v.h.f. since grid rectification generates harmonics in the TV bands. The filament choke, RPC3, is mounted so that the filament end is close to the filament terminals on the tube sockets: the other end is bypassed directly to the chassis.

The shielding around the amplifier consists of two pieces of sheet aluminum and a perforated aluminum ("do-it-yourself" type) cover having the shape of an inverted U. The top view shows how the rear wall is made. Its edges are bent to provide flanges for fastening the cover with sheet-metal screws, and there is a similar flange projecting to the rear at the bottom for fastening the wall to the chassis. The front piece extends the full height of the panel and is identically drilled and cut out for meters and controls. It has flanges at the top and extending down the sides from the top to the chassis. The cover itself extends down over the sides of the chassis for about one inch. Numerous screws are used for fastening the cover, to prevent leakage of harmonics.

The shields over the meters are made as described in the caption for the inside top view. Meter leads are bypassed to the shield boxes where they emerge.

The Handbook should be consulted for methods of checking and adjustment of the directional coupler.

**Operating Conditions and Tuning**

The voltage delivered by the power supply is approximately 1500 volts with no drive and with the tubes taking only the no-bias static plate current, which is about 60 ma. At the full load of 350 ma, the voltage is slightly under 1400. Optimum operating conditions for 1400 volts at 350 ma, peak-envelope power input as an s.s.b. linear call for a peak-envelope grid current of 60 ma. The peak-envelope tube power output is close to 350 watts under these conditions. The same operating conditions are also about optimum for c.w.

The behavior of the cathode current when tuning a grounded-grid triode amplifier is extremely confusing, and the meter is principally useful as a check on operating conditions rather than as a tuning indicator. The best indicator of proper tuning of the plate tank capacitor is the forward-power reading of the directional coupler. For any trial setting of the loading controls and driving power, always set the plate tank capacitor control at the point which results in a maximum reading on the power-output indicator. The power indications are only relative, of course, and the sensitivity control should be set to give a reading in the upper half of the scale.

The objective in adjusting loading and drive is to arrive at maximum power output simultaneously with a plate current of 350 ma. and a grid current of 60 ma.— that is, a total cathode current of 410 ma. when the grid current reading is 60 ma. The loading is critical. If the amplifier is not loaded heavily enough the grid current will be too high and the right value of total cathode current either will not be reached or, if reached, the amplifier will be operating in the

(Continued on page 168)

The r.f. section with the shield cover removed. Components here are readily identifiable by reference to the circuit diagram. The meters are enclosed in rectangular boxes made from thin aluminum sheet, formed to be fastened by the meter mounting screws. The back covers on these boxes are made from perforated aluminum, folded over at the edges and held on the boxes by sheet-metal screws. The switch for shifting the 0-500 millimeter (left) from grid to cathode is concealed by the box which encloses the meter.

**January 1960**
One of the most useful tools at the disposal of the radio engineer is a transmission-line calculator known as the Smith Chart. This device eliminates the need for mathematical gymnastics and greatly reduces the laborious task of solving most transmission-line problems. In this article, K6CRT discusses the use of the Chart in some of its simpler applications.

By L. A. CHOLEWSKI, K6CRT, EX-W8SVK

In all probability, the chief reason that more use of the Smith Chart is not made by amateurs in solving some of their antenna-feeding problems is its formidable appearance at first glance. But a brief description of its construction and some of its simpler applications will show that it is far less complicated than its aspect.

Resistance Scales

Referring to Fig. 1, the Smith Chart 1 consists basically of a circle upon which are placed various circular scales. The only straight line on the Chart—the vertical one in Fig. 1A—is the resistance axis. The numbers along this line indicate percentages of the value assigned to the center point—the 100 per cent point indicated by the numeral 1.0—usually referred to as prime center. The calibration of this line runs from 0 at the top to infinity (∞) at the bottom. If prime center is assigned a value of 100 ohms, then 0.5 represents 50 ohms, 0.2 represents 20 ohms, 2.0 represents 200 ohms, etc. If a value of 50 ohms is assigned to prime center, corresponding values will be 25, 10 and 100 ohms.

It is seen that in each case the point on the Chart for any resistance value is determined by dividing the value by the number assigned to prime center. This is called “normalizing.” Similarly, points on the Chart are converted back to actual resistance values by multiplying by the value assigned prime center. This process permits the use of the numbers printed on the Smith Charts for values irrespective of their magnitudes. It is common practice to indicate actual impedance values in capital letters (Z1, Z2, Z3, etc.) and corresponding normalized values in small letters (z1, z2, z3, etc.).

Resistance circles (see Fig. 1A) are centered on the resistance axis, are tangent to the outer circle at the $R = \infty$ point, and pass through the calibrated points on the resistance axis. All points along any resistance circle have the same resistive value as the point where the circle crosses the resistance axis.

1 Smith Charts can be obtained at most college book stores.

Some Amateur Applications of the Smith Chart

Reactance Scales

Superimposed on the resistance-circle pattern are segments of other circles tangent to the resistance axis at $R = \infty$. See Fig. 1B. These are reactance circles, the large outer circle being the reactance axis. The reactance axis is also calibrated in percentages of a selected value—usually the value assigned to prime center. All points along any reactance circle have the same reactive value as the point where the reactance circle touches the reactance axis (outer circle). Values to the right of the resistance axis are positive (inductive), and those to the left of the resistance axis are negative (capacitive).

Plotting Impedances

The plotting of complex impedances can best be explained by one or two examples. Suppose we have an impedance consisting of 50 ohms resistance and 100 ohms inductive reactance ($Z = 50 + j100$). If we assign a value of 100 ohms to prime center ($Z_p = 100$), the $z$ point will be plotted at the intersection of the $50/100 = 0.5$ resistance circle and the $100/100 = 1.0$ reactive reactance circle (point A in Fig. 1B). If a value of 50 ohms had been assigned to prime center, the same impedance would be plotted at the intersection of the $50/50 = 1.0$ resistance circle and the $100/50 = 2.0$ reactance circle (point B in Fig. 1B).

For example, if a value of 200 is assigned to prime center, then point C in Fig. 1B represents an impedance of $0.5 \times 200 = 100$ ohms resistance, and $1.0 \times 200 = 200$ ohms negative (capacitive) reactance ($Z = 100 - j200$).

In solving transmission-line problems, prime center is usually assigned a value equal to the characteristic impedance of the transmission line to be used. Always record this value at the start to avoid any possible confusion later on.

Wavelength Scales

Aside from the calibrations already mentioned, the perimeter of the large circle has additional scales. Two of these scales (see Fig. 1C) are calibrated in terms of portions of a wavelength.
along a transmission line, one scale (running counterclockwise) starts at the generator (transmitter) end of the line and progresses toward the load (antenna), while the other scale, in reverse, starts at the load and works back toward the generator. The complete circle represents a half wavelength. It is assumed that no amateur should have difficulty in determining portions of an electrical wavelength from the formula:

\[ \lambda = \frac{f \cdot 50}{1846} \]

where \( l \) = length in ft. and \( k \) is the velocity factor furnished in transmission-line characteristic tables. Since the same conditions repeat every half wavelength along the line, the zero point on the wavelength scales may be considered as any multiple of a half wavelength as well as zero. The use of the wavelength scales will be illustrated presently.

**Impedance Transformation**

When a lossless transmission line is terminated in some impedance other than a pure resistance having a magnitude equal to the characteristic impedance of the line, the input impedance of the line will vary depending on the length of the line. If the terminating impedance is known, it is a simple matter to determine the input impedance of the line for any length of line by means of the Smith Chart.

First we plot the load (antenna) impedance on the Chart. Suppose we have an antenna that shows a resistive component of 25 ohms and an inductive reactance of 25 ohms \((Z_{L} = 25 + j25)\). If the transmission line has a characteristic impedance of 50 ohms, we normalize the antenna impedance by dividing by 50 \((Z_L = 0.5 + j0.5)\). This is plotted as point \(Z_L\) on the Chart of Fig. 2.

A circle whose center is on prime center and whose perimeter passes through the plotted point is next inscribed on the Chart. This circle is usually referred to as an s.w.r. circle, since the s.w.r. on the line when terminated by the plotted impedance can be determined by the points at which the circle crosses the reactance axis. The s.w.r. (2.6 in this case) may be read directly where the bottom of the circle crosses the reactance axis. (The reading of 0.384 at the top of the circle is the reciprocal — 1/2.6 — which, of course, indicates the same s.w.r.)

The next step in determining the input impedance of the line is to draw a vector from prime center through \(Z_L\) to intersect the wavelength scales. Since we are starting at the load, the "Toward Generator" scale is used. To find the input impedance of the line at any desired distance from the antenna, we simply rotate the vector through this distance along the wavelength scale. The \(Z_L\) vector intersects the wavelength scale at 0.889. If we want to find the line input impedance when the line is 0.3 wavelength long, for instance, we add 0.088 + 0.3 = 0.388 and move the vector to this point on the wavelength scale. Then the normalized impedance is

![Fig. 1—Construction of the Smith Chart. A—Resistance scales, B—Chart with reactance scales added, C—Wavelength scales.](image-url)
read at the intersection of the new vector and the s.w.r. circle. The reading here is \( z_1 = 0.6 - j0.67 \). The actual input impedance is obtained by multiplying back by the line \( Z_0 = 50 \), to give \( Z_I = 30 - j33.5 \) (30 ohms resistance, 33.5 ohms capacitive reactance).

It is interesting to note that the Chart indicates two line lengths for which the input impedance will be resistive. These points are indicated by \( z_1 \) and \( z_2 \) in Fig. 2, where the antenna-impedance vector swings across the resistance axis. One of these lengths is \( 0.25 - 0.088 = 0.162 \) wavelength; the other is \( 0.5 - 0.088 = 0.412 \) wavelength. Since the Chart reading at \( z_1 \) is 2.6, \( 0 \), the line input impedance \( Z_I = 50 \times 2.6 = 130 \) ohms for the 0.162-wavelength line. Similarly, the reading at \( z_2 \) is 0.384, \( 0 \), and the input impedance with the 0.412-wavelength line is \( 50 \times 0.384 = 19.2 \) ohms. It should always be remembered that any number of half wavelengths can be added to the lengths given by the Chart without changing the line input impedance (assuming a lossless line).

From this, it can be seen that a transmission line terminated in a load not the same as the characteristic impedance of the line acts as an impedance transformer, transforming the value of the load resistance to some other value at the input to the line. By proper selection of line length characteristic impedance, any load resistance can be transformed to any other value desired.

**Measuring Antenna Impedance Remotely**

From the foregoing, it may be evident that the process can be reversed to determine the feed-point impedance of the antenna when the length of the line and the line input impedance are known. The line input impedance can be measured by means of an impedance bridge. The electrical length can also be determined either by direct measurement of its physical length and applying the velocity factor, or indirectly by measuring the input impedance of the line when the line is terminated in a short circuit.

In one actual measurement made by the author, the input impedance of a 50-ohm line terminated in a short circuit was \( 2.5 + j50 \), or a normalized value of \( 0.05 + j1 \). This point, \( z_{ls} \), is shown plotted on a Smith Chart in Fig. 3. The terminating load in this case is \( Z_{ls} = 0 + 0j \) (a short circuit). The vector for this load coincides with the upper half of the resistance axis. Using the “Toward Generator” scale, we find that the distance between the \( Z_{ls} \) vector and the \( Z_{ls} \) vector is 0.125 wavelength. This is the electrical length of the line.

With the antenna replacing the short circuit, the line input impedance was measured at \( Z_{IA} = 50 - j35 \), which normalizes to \( z_{IA} = 1.0 - j0.7 \). This impedance is plotted, the s.w.r. circle is sercibed and the \( z_{IA} \) vector drawn. Since this is the line input impedance, the “Toward Load” scale is used. The vector intersects the wave-
length scale at 0.153. The vector is now moved the length of the transmission line — 0.125 wavelength — toward the load, to 0.153 + 0.125 = 0.278 wavelength. The normalized antenna impedance, $z_A$, can now be read at the intersection of the new vector and the S.W.R. circle. The Chart shows this value to be $1.82 + j0.48$, which gives an actual value of $Z_A = 50 (1.82 + j0.48) = 91 + j24$. The S.W.R. circle shows that the S.W.R. on the line is 2.1.

**Cable Attenuation**

In the foregoing, a lossless transmission line has been assumed. With a practical line, the S.W.R. will change with the length of the line, being greatest at the load end of the line and decreasing as the length of the line is increased. Similarly, losses in the transmission line will cause the line input impedance to vary as the length of the line is changed, even though the line may be terminated in an accurately-matched load. Therefore, S.W.R. measurements made at the input end of the line are not a strictly true indication of the mismatch between the load and the transmission line, and losses in the line will cause some error in the calculations of load impedance from measurements of impedance made at the input to the line, unless suitable correction is applied. The error in both cases will be small if the line is short and has low inherent loss, and the load is reasonably well matched to the line. The error will be greater if the line is long, has high loss per unit length, or if it is operated at a high S.W.R.

True values of S.W.R. and load impedance can be determined from the Smith Chart if the total line loss is known, as in the following example.

The input impedance of a 50-ohm terminated line having a loss of 3 db, is measured and found to be $z_{IM} = 100 + j0$. This measured value is normalized and plotted and the S.W.R. circle and vector are drawn as shown in Fig. 4. The chart of Fig. 5 shows that a line having a 3-db loss when terminated by a load equal to the characteristic impedance of the line will have an S.W.R. of 3 when terminated in a short circuit. This S.W.R. circle is drawn on the chart. A line ABC is drawn at right angles to the $z_{IM}$ vector, intersecting the S.W.R. circle of the shorted line and the reactance axis. A straight line is then drawn from B to $z_{IM}$. A second line parallel to the latter is drawn from point C to intersect the $z_{IM}$ vector. An S.W.R. circle drawn through this intersection indicates the true S.W.R. (4.8). It should be noted that the ratio of measured load impedance, $100 + j0$, to the line characteristic impedance, 50 ohms, would indicate an S.W.R. of only 2 to 1. The true value of load impedance is $4.8Z_0 = 4.8 \times 50 = 240$ ohms. (This compares with the measured value of 100 ohms.)

The loss of 3 db, used in this example is representative of what might be found in a 150-foot length of small coax cable at 28 Mc. So the next time anyone tells you that his S.W.R. is 1 to 1, you will have good reason to doubt his accuracy. If the same construction is applied to Fig. 3, it will be found that the true values will be only slightly different from the uncorrected values. In this case the S.W.R. with the line shorted is 35 to 1, corresponding to a line loss of 0.25 db, on the chart of Fig. 5. This low line loss, of course, accounts for the smaller error.

![Graph showing the relationship between the S.W.R. measured with a line terminated in a short circuit and the loss in db, measured when the line is terminated in its characteristic impedance.](image)
Radioteletype Conversion from Receiver I.F.

The i.f. type converter for radioteletype makes direct use of the f.s.k. signal, with suitable cleaning up and amplification, and does not require the sharp audio filters used in the two-tone method. Although at first glance the unit described here may seem to be elaborate, this is partly because it includes power supplies and a scope amplifier for adjustment and monitoring. The principal sections are shown in four separate diagrams; in only one, the converter proper, are there any techniques unfamiliar to the amateur without previous RTTY experience.

There are two general methods of receiving radioteletype. One is to use a discriminator to detect the signal shift at the intermediate frequency of the receiver. The other is the audio system, using two tones either received directly from a modulated signal or developed in the receiver by using the b.f.o. to beat against the shifting carrier, the audio tones then being separated in filters to develop the proper keying.

This article will discuss the circuitry and operation of an i.f. type converter or terminal unit that was constructed as a project for the Central Technical Net of the Air Force MARS program. Certain portions of the circuit were taken from the CV-57/URR military radioteletype converter, with various modifications to make the unit adaptable to currently-available surplus parts.

Converter Circuit

The CV-57/URR converter operates on receiver intermediate frequencies from 395 to 470 kc. The receiver's i.f. is converted to 30 kc., then

\[ QST \text{ for} \]
amplified, clipped by a limiter and fed into a discriminator. The discriminator output is amplified, filtered, amplified again and then used to trigger two Eccles-Jordan flip-flop multivibrator stages in cascade to key the RTTY loop keyer tubes.

The main point of difference in the unit constructed here is the use of 85 kc., the intermediate frequency of the BC-453 Command receiver, as the second i.f. The 453 not only makes an excellent “front end” for the converter but is capable of tuning to any receiver intermediate frequency from 190 to 550 kc. The BC-453 is modified by removing the third i.f. can and the audio tubes, and then the plate of the 12SK7 second i.f. tube is coupled to an external i.f. strip using the same i.f. transformers as in the second stage of the BC-453 (part No. 7367). The signal next is passed through one stage of amplification and one stage of limiting, and then into a discriminator using two i.f. transformers as shown in Fig. 1.

From this point on the circuit, Fig. 2, is much the same as that of the CV-57. The pulses from the discriminator are amplified and fed into a low-pass filter having a cut-off frequency of 140 cycles. The signal is again amplified and then applied to the grid of the trigger driver tube. $V_9$, Connected between the grid of the trigger driver tube and ground is a d.c. restorer and its associated circuits. This circuit uses the two diodes of a 6AI5; $V_5$; the lower one in Fig. 2 clips off the negative portion of the signal and the upper one, with positive back bias, clips the signal above a level of plus four volts. The clipping eliminates any superimposed noise and telegraph distortion, so that the signal appearing at the grid of $V_8$ is a square wave having a peak amplitude of four volts and is identical in shape with the discriminator output.

**Keying Circuits**

The output of the trigger driver is directly-coupled to an Eccles-Jordan flip-flop stage, $V_7$, which in turn is capacity-coupled to a similar flip-flop stage, $V_5$. The flip-flop stages have two stable conditions, one of which results in a higher d.c. voltage across the load resistor than the other, and the stages are switched from one stable state to the other according to the polarity of the square wave of signal voltage from the trigger driver tube. The trigger output, taken from one or the other of the second-stage grids, is thus a keyed d.c. voltage, and is applied to the grids of the 6AQ5 keyer tubes to shift them between the conducting and nonconducting states.

In normal RTTY practice, the loop or locally-keyed circuit is closed during stand-by or mark signal. This keeps the machine in an idling condition to receive the coding pulses that key the loop circuit. The machine is keyed directly from the plates of the 6AQ5s in the CV-57, but in this unit we wished to key a
Fig. 2—Converter keyer circuit. Fixed resistors are 1/2-watt composition except as indicated. Capacitors with capacitance expressed in μf. are paper; others may be either ceramic or mica. The control circuit (K1) and external keying terminals are used with associated FSK transmitting equipment.

J1—Open-circuit jack.
K1—Polarized relay (Sigma 7JOZ-160T).
K2—A.c. relay, 115-volt coil, s.p.d.t.
L1—32 henrys at zero d.c., approx. 500 ohms (military surplus; suggested replacement, UTC type VIC-18 or VIC-19, or filter choke rated at approx. 30 henrys).

Separate loop circuit so a biased polar relay is connected in the plate circuit of the 6AQ5s. Because of the capacitive coupling in the amplifiers, no d.c. voltage is available from the signal to keep the output tubes conducting during mark or idling. Therefore, a “mark return” circuit is provided in the trigger driver stage for this purpose. In the “normal” position of S1, used when the signal shifts to the higher frequency in the mark or stand-by position, the grid of the trigger driver is four volts positive, setting the trigger stages to cause the 6AQ5s to conduct. The “reverse” posi-

Top view, from the rear, of components on the 12 X 17 x 3-inch chassis. Power connections to the BC-453, at left, are made through the dynatron socket on its rear deck. Between the 453 and the chassis wall are the output jack (which must be insulated from the chassis) and the loop current control, R1. The external I.F. strip (Fig. 1) is alongside the 453, beginning near the rear edge of the chassis and running toward the front (top in this view). The 12AX7 scope amplifier is alongside the limiter, V1, with its controls, R2 and R4, nearby on the chassis. The signal amplifier and trigger circuits (Fig. 2) are alongside the two right-hand meters. The large can in this area is the low-pass filter inductor, and to its right is the polar relay, K1. Power-supply components are grouped on the near right-hand corner of the chassis.

QST for
tion is used when the r.f. signal shifts to the lower frequency on mark. In this position of $S_3$A the grid of the trigger driver is at zero voltage: this sets the trigger stages in the opposite state, but $S_2$ simultaneously selects the trigger output of proper polarity to cause the 6AQ5s again to conduct.

The "per cent mark" control, a variable resistor in the cathode circuit of the trigger driver, $V_n$, is for adjustment of the operating bias for most linear amplification of the pulses in this stage. This is necessary because the pulse widths in the loop circuit must be the same as at the output of the discriminator to prevent loss of printing margin. This control, $R_3$, is adjusted to give a symmetrical square wave at the plates of the 6AQ5s.

**Discriminator Alignment**

For proper operation the output of the discriminator must be kept at a zero average; that is, the incoming signal must be tuned so that its mean frequency is centered in the discriminator characteristic. The tuning (assuming that the discriminator circuits have been properly aligned for a symmetrical characteristic) is checked by connecting a 50-0-50 microammeter in series with the one-megohm "threshold" (audio level) control, $R_2$. This potentiometer limits the current through the meter as well as acting as an output control for the discriminator.

Most tele-type transmissions operating at sixty words per minute use a shift of 850 cycles. It was decided, therefore, to adjust the discriminator to detect a shift of 425 cycles either side of center of the nominal 85-ke i.f.

First, it is necessary to have some sort of signal generator which can be accurately adjusted to shift the output frequency 425 cycles either direction. Most signal generators will reach the normal i.f. of 45S ke. Connect the generator to the input terminals of the converter and adjust its fre-

![Fig. 3.—Oscilloscope monitor vertical output circuit. Capacities are in $\mu F$; fixed resistors are $\frac{1}{4}$ watt.](image)

$R_n$—1-megohm composition control, audio taper.

$R_p$—0.5-megohm composition control, linear taper.

$S_i$—S.p.d.t. push-button switch.

quency to the i.f. of the receiver to be used. Tune the BC-453 to this frequency and peak the i.f. strip in the BC-453, including transformers $T_1$, $T_2$, and $T_3$, for maximum d.c. voltage developed across the 1-megohm resistor in the grid return of $T_3$ (see Fig. 1). With full limiting this should be about $-40$ volts.

Next, increase the generator frequency 425 cycles and adjust $T_4$ for maximum positive output at Pin 1 of the 6AL5 discriminator, $V_{ua}$, using a v.t.v.m. with a zero-center scale. Reduce the generator frequency 850 cycles and tune $T_4$ for maximum negative output. Adjustment of one transformer affects the adjustment of the others; consequently, alternate adjustments must be made as the frequency is shifted through 850 cycles to obtain equal and opposite voltages at Pin 1 of $T_3$. It should be remembered that in i.s.k. the mark condition is high and the shift to the space condition is to a frequency 850

(Continued on page 158)
Two-Band Coverage with the BC-454

The BC-454 Command receiver, whose tuning range is nominally from 3 to 6 Mc, may be modified very simply to cover the entire 3.5- and 7-Mc bands.

With the bottom cover removed, the coil unit is observed right behind the front adapter. Remove the two screws which hold the coil unit to the sides of the cabinet and then gently pull the coil unit, which is held in place by sets of miniature banana plugs, out of the chassis.

* Coil Alterations *

Remove the coil for the r.f. amplifier, which is identified by a red dot and which hereafter will be called L4, from its case and remove 7 turns and then restore it to its case. In the correct orientation, the three colored dots are in a line.

Next remove the interstage transformer, denoted by a yellow dot, from its case. This contains two coils. The multilayer coil, L2, is connected to the plate of the amplifier and is untuned, while the single-layer coil, L3, is connected to the grid of the mixer. Remove 7 turns from the single-layer coil at the end remote from L3, and then restore the transformer to its case.

Next, remove the local oscillator coil denoted by a blue dot. This contains a small tickler coil, L4, and a larger tuned coil, L5. Remove 4 turns from the far end of the long coil, and restore this to the holder. Note that in the correct orientation the banana jacks of the blue-dot coils are oppositely directed to the others. In soldering, be sure that no excess solder flows into these jacks, as the plugs will jam. Then replace the coil set in the chassis. Before applying any appreciable force, be careful that the plugs and jacks are correctly seated because these miniature plugs will not withstand much abuse, and a broken plug would be almost impossible to replace.

*Circuit Alignment*

Next, remove the outer cover exposing the screw adjustments on the trimmer capacitors. Get the main tuning dial to the highest possible frequency setting (considerably beyond the 6-Mc mark). Adjust the frequency of a signal generator to 7.3 Mc, and align all the trimmers. Then set the generator to 3.5 Mc, and its signal should be found very close to the lowest frequency setting of the main dial. Test the alignment of the mixer trimmer and see whether maximum response on the input circuit can be obtained within range of the trimmer on the front panel.

If these tests yield satisfactory results, the modification can be considered complete. Otherwise it is necessary to trim the coils. If the tuning range of any circuit is insufficient (a situation which is indicated by the need for more capacitance than is available in the trimmers to reach 3.5 Mc), the inductance must be increased and the capacitance of the trimmer must be decreased. Conversely, if the tuning range is excessive, the inductance must be decreased and the trimmer capacitance increased. In this way good tracking can be obtained in the amateur bands at the ends of the dial. In the center the tracking is not perfect but is adequate for most purposes.

On finding that the performance generally was satisfactory by following this procedure, I put both covers back on and indicated the new calibration on the dial by making faint scratches at 0.1-Mc intervals. Because of the success of this modification, I have never felt the desire to buy a 6-9.1-Mc Command receiver for covering the 7-Mc band.

*Other Bands*

Some time later I bought a second BC-154, and I had the unusual luck of being able to obtain several extra coil sets also. I proceeded to wind coils which covered all bands from 1.7 to 50 Mc, inclusive, as shown in the accompanying table. Coil Sets A (1.7-3.6 Mc) and C (7.0-14.4 Mc) employed the original forms. In fact, some of the windings were left undisturbed. In set C, the desired tuning range was obtained by removing more turns than in set B. In set A, part of the original windings were removed and replaced by new windings. In sets D and E, the original forms were replaced by pieces of 3/8-inch polystyrene rod held by screws tapped in at one end (except that L4 in set E is self-supporting). The spacings between the near ends of the L3 and L4, and the near ends of L4 and L5, were about 1/16 inch. The coils were trimmed by a
process analogous to that described in connection with set B (3.5-7.3 Mc.). On several of the higher-frequency coils it was necessary to adjust the spacing of the last one or two turns to get good tracking. The values for $L_2$ and $L_4$ were determined by guesswork, except that $L_2$ of set B was adjusted for resonance at 51 Mc. with a grid-dip meter, with $L_4$ disconnected. Also, no attempt was made to vary the resistors in the oscillator coil holder. Holes were drilled in the outer cover to permit direct access to all trimmers.

With set A, some background QRM results from i.f. feedthrough because the i.f. of 1.415 Mc. is so close to the signal frequency. Also, for the same reason, tracking is difficult and it is not possible to cover both the 1.7- and 3.5-Mc. bands with the same coils. With sets C and D, tracking in the center of the dial is poorer than with set B, and it is usually worth the effort to rotate the mixer trimmer on 21 Mc., after having set it for 14 and 28 Mc. The stability is not good, but c.w. contacts may be carried out on 28 Mc. with a little effort. Although set E tunes down through the 28-Mc. band, no satisfactory operation below about 40 Mc. was obtained. Stability for phone contacts on 50 Mc. is adequate, but it is inadequate for c.w. contacts. On those higher frequency bands greater stability and sensitivity can be obtained by using this receiver at low frequency with a converter ahead of it.

Even though I have demonstrated that the BC-454 can cover all the bands from 1.7 to 50 Mc., I do not feel that it should be considered an "all-band" receiver, even if one is able to acquire extra coil sets.

The inaccessibility of the coils and the fragility of the miniature banana plugs makes frequent coil changing undesirable, and ideally each receiver should be permanently on one range. With two receivers respectively employing sets A and C, one can effectively monitor the five most popular bands, 3.5-28 Mc., inclusive, and should there develop any pile-ups denoting the presence of some rare DX, he can then set his receiver of more advanced design and his transmitter on that band and go after it. This is one of the principal facilities provided by Larson B. Rapp's famous Q8-50 receiver, and it is obtainable by the method which has been described at a price somewhat less than $1,000.

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### Data for Modified BC-454 Coils

<table>
<thead>
<tr>
<th>Frequency Set (Mc.)</th>
<th>$L_1$ (R.F. Amp.)</th>
<th>$L_2$ (Amp. Plate)</th>
<th>$L_3$ (Mixer Grid)</th>
<th>$L_4$ (Osc. Plate)</th>
<th>$L_5$ (Osc. Tuning)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 1.7-3.8 Original</td>
<td>$\frac{1}{2}''$ of orig. with $\frac{1}{4}''$ winding of No. 22 wire added at end</td>
<td>Original $\frac{1}{4}''$ of orig. with $\frac{1}{4}''$ of No. 32 wire added to near end and $\frac{1}{4}''$ of No. 32 added to far end</td>
<td>Original $\frac{1}{4}''$ of No. 32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 3.5-7.3 Original</td>
<td>7 turns off original</td>
<td>Original</td>
<td>7 turns off far end</td>
<td>Original</td>
<td>4 turns off far end</td>
</tr>
<tr>
<td>C 7.0-14.4 Original</td>
<td>Original trimmed until 14 turns remain</td>
<td>Original Far end of original trimmed until 12 turns remain</td>
<td>Original Far end of original trimmed until 11 turns remain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 14.0-28.7 $\frac{3}{4}''$</td>
<td>9 turns No. 22, $\frac{1}{4}''$ long</td>
<td>15 turns No. 28</td>
<td>10 turns No. 22, $\frac{3}{4}''$ long</td>
<td>14 turns No. 28</td>
<td>9 turns No. 22, $\frac{1}{4}''$ long</td>
</tr>
<tr>
<td>E 40-50 $\frac{3}{4}''$</td>
<td>5 turns No. 14, $\frac{1}{4}''$ long</td>
<td>8 turns No. 28</td>
<td>4 turns No. 14, $\frac{3}{4}''$ long</td>
<td>5 turns No. 28</td>
<td>4 turns No. 14, $\frac{1}{4}''$ long</td>
</tr>
</tbody>
</table>

Notes:
1. All wire enamelled.
2. All windings are close wound unless both the number of turns and the length are specified.
3. $L_4$ and $L_5$ are wound in the same direction.
4. "Far" denotes the end remote from the other winding on the same form, and "near" denotes the end adjacent to the other winding on the same form.
5. The oscillator operates on the high-frequency side of the signal.

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January 1960
Some Modifications for a Popular Unit

BY STIRLING M. OLBERG, WISNN

The “S.S.B. Package” Plus

A home-built s.s.b. exciter with professional appearance. The slide-rule dial is described in the text.

3) A slide-rule dial to fit the required capacitor gang.
4) An electronically-regulated power supply for the 195-volt needs of the unit.
5) A notebook and mechanical-layout diagrams so that the unit could be reproduced. These objectives were accomplished as follows:

Filter

1) The use of a mechanical filter involved a change in the original circuitry. Considerable time was spent in deciding what type of circuit should be used with a Collins Model F-455 mechanical filter. A breadboard unit was constructed and several popular systems tried. These did not work well or would not stay in adjustment as far as carrier balance was concerned. A circuit shown in the Collins advertisement on page 2 of the June, 1958 issue of QST was the next to be tried. It seemed to be the answer to the problem and was the circuit eventually used.

To solve the problem of obtaining closely-matched diodes, a Sylvania Type 1N40 was purchased. This small unit, which resembles outwardly a 6L6 tube, proved to be an excellent choice since it is not affected by ambient-temper-

Fig. 1 — Diagram showing balanced-modulator circuit and connections to mechanical filter. Unless otherwise indicated, capacitances are in µuf, capacities marked with polarity are electrolytic, resistances are in ohms, and resistors 1/2 watt.

C₁—Value designated for each filter by manufacturer.
C₂—Ceramic trimmer.
T₁—Tube-to-line transformer; primary 10 to 20 K, secondary 500 or 600 ohms, c.f. (Thordarson 22595, UTC A29 or equivalent).
Z₁—1N40 (Sylvania). Numbering refers to pins on octal base of 1N40.
F₂—Mechanical filter (Collins F455 F-31).

QST for
ature changes that might seriously affect carrier balance. This unit is easily mounted in an octal socket. The circuit is shown in Fig. 1. A photograph of the s.s.b. generator unit is also included.

2) The keying relay for this unit is a double-throw type. It was evident that the thermal noise generated in the 6146 amplifier while in a stand-by condition impaired reception. This relay therefore swings the screen voltage from a positive voltage to a negative one.

The relay is a Sigma type 22RJCC-5000-G/SIL found in most surplus advertisements. Its coil resistance is 5000 ohms and the relay directly replaces the Potter-Brumfield type SM5LS originally designated. The circuit changes involved in the use of this relay are shown in Fig. 2. The relay is small enough so that it can be mounted in the same position as the original one.

**Dial**

3) The ARC-5 gang capacitor originally prescribed for this unit can be modified for a slide-rule dial very easily and without the need for any special tools. A 2\(\frac{1}{4}\)-inch dial pulley is fastened to the threaded dial shaft with the original dial nut. At the top front will be found on either end of the capacitor two threaded mounting tabs bent at right angles to the gang. An aluminum plate 7 inches long and 2\(\frac{1}{2}\) inches wide, made of 16-gauge aluminum, is mounted on these tabs. This provides a mounting plate for two cable pulleys. The cable, made of standard radio dial cord, is fastened to the large dial pulley at one end. Two turns are wound around the drum and then passed over the cable pulleys and back to the dial pulley, where it is tensioned with a radio dial spring.

Attention should be given to the direction that the gang moves so that it will coincide with a dial scale marked 0 to 1. The dial is marked off in tenths for a one-megacycle range. The photograph and the sketch found in Fig. 3 will probably furnish a better description.

**Regulated Supply**

4) An electronically regulated supply was used.
because the screen voltage of the 6146 and all other circuits at 195 volts seemed quite a load to pull through a resistor and two VR tubes. The circuit used can be found in The Radio Amateur's Handbook, 1957 edition, Chapter 7, page 228, Fig. 7-17. (Also page 232, Fig. 7-17, 1959 edition — Ed.)

**Drawings**

5) A notebook full of data was kept on the progress and results of this exciter. All schematic changes were entered, and last but most important, mechanical layout drawings were made to full scale. Two units were constructed from these drawings. A full set of drawings for the mechanical layout of the panel, chassis, s.s.b. generator chassis and dial are available at W1SNN for postage to anyone who would like them.

A Variflex chassis was used. This is made by the Hammar Company (Princeton, N. J.) and can be obtained at most electronic distributors for a moderate sum.

The unit in use at this station has given me many happy hours of s.s.b. and e.w. operation; the unit for WIAZI is nearing completion and looks exactly like mine. Two other operators, W1YBN and W1KYE, have constructed these units, one with the crystal filter, the other with a mechanical filter, and they likewise find them a pleasure to operate.

A phasing-type s.s.b. generator chassis that can be used in place of either crystal or mechanical-filter chassis is being tried experimentally and works quite well. It follows the circuitry of W2EWI's "Cheap and Easy Sideband," without the amplifier. It fits on a small chassis that could replace the mechanical-filter or crystal-filter chassis.

The only adverse comments on the whole system were by nonhams. My XYLs and XYUs of W1YBN and W1KYE feel that it looks nice when it's all done, but the interval between the start and finish was sort of hard to take, since we all became very hard to live with until we had the beasts tamed and on the air.

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**New Apparatus —**

**Amphenol Marine-Core Twin-Lead**

Amphenol's new Marine-Core Twin-Lead is an inexpensive, flexible, lightweight and low-loss transmission line designed for television use in weak-signal or fringe areas where attenuation should be kept at a minimum. Of course it has immediate amateur application as a low-loss line, especially at v.h.f., where damp or rainy conditions usually upset transmission-line performance. Marine-Core line is practically impervious to moisture effects and the attenuation increases only slightly even when the line is completely submerged in water! For instance, 100 feet of regular Twin-Lead submerged in water has an attenuation at 100 Mc. of 11.5 db., but Marine-Core shows only 2.5 db. In dry air it has an attenuation of about 1.5 db. per 100 feet at 100 Mc. It probably would be possible to bury Marine-Core, if necessary — an advantage formerly possible only with coaxial feed lines.

Marine-Core has a nominal impedance of three hundred ohms, an over-all width of a little under 1/2 inch and a conductor spacing of 0.178 inch. The two conductors are each 7 strands of No. 28 copper wire, imbedded in foamed polyethylene. The entire cable is covered with an outer jacket of brown polyethylene. A cutaway section of Marine-Core Twin-Lead is shown in the accompanying photograph. It is available in 50-, 75-, 100- and 500-foot coils.

— E. L. C.
IN COMMON with many others who do not have the space for a full-size 20-meter beam, I have been sold on the short-beam compromise ever since the idea was first introduced several years ago. More recently, having the desire to expand to three-band operation, I decided to see what could be done using elements of essentially 10-meter size. The final result is shown in the sketch of Fig. 1 and the photographs.

There is a total of four elements. Three elements are active on 20 meters and two elements on 15 and 10 meters. Element A is the driven element for both 15 and 20. Capacitive hats (see Fig. 2) serve to load the element to resonance at 15 meters. Loading coils \( L_1 \) are used to load the elements further for 20-meter resonance. \( L_2 \) and \( C_1 \) are series resonant at 15 meters and serve as an electronic switch to automatically short out the 20-meter loading coil when operating on 15.

Element B is a 15/20-meter reflector operating on the same principle as the driven element. Operating in a like manner, Element C serves as director for 10 and 20 meters, the series-tuned circuits in this case being tuned to 10 meters. Element D is a conventional 10-meter driven element.

The driven element A is fed with a single RG-58/U line with separate gamma matching sections for 15 and 20, while the 10-meter driven element also has its own line and matching section. The matching sections are the "trombone" type described in earlier issues of QST.\(^1\)

**Construction**

The capacitive hats, shown in Fig. 2, are 18-inch wheels of 1/4-inch aluminum tubing with

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four spokes of the same material. The ends of the spokes are flattened, bent at right angles, and drilled. Small rivets are used to fasten the spokes to the rim. Two bolts at right angles fasten opposing pairs of spokes to the ends of telescoping outer sections of the 15/20-meter elements.

The construction of the sections which include the loading coils and the associated series-tuned circuits is shown in Fig. 3. Each of the loading coils has 18 turns of No. 12 wire wound at the center of a 12-inch length of 1-inch maple dowel boiled in paraffin. The ends of the dowel are inserted 4 inches into the adjacent element members, leaving a 4-inch length of exposed dowel on which \( L_1 \) is wound. Bolts through the tubing and dowel keep the dowel in place.

The series capacitors are tubular, made in the same manner as the gamma capacitors. Aluminum strap is used to suspend the capacitor from the element members so that it will bridge the loading coil. One of the straps is broken with a strip of polystyrene insulation, and the series coil, \( L_2 \), is bridged across the polystyrene. Each of these coils has 12 turns of No. 12 wire \( \frac{3}{4} \) inch in diameter, approximately 2 inches long, self-supporting.

**Adjustment**

The adjustment procedure should be the same as for any other parasitic beam, with the following variations. With shorting jumpers placed across the loading coils, the 15-meter series circuits are tuned to the center of the band (21.35 Mc. for phone), using a grid-dip oscillator. Then, with the jumpers removed, the element length is adjusted for resonance at the same frequency. Finally, with the element excited at the center of the desired portion of the 20-meter band (14.25 for phone), the taps on the loading coils are adjusted to resonate the element at this frequency, keeping the taps equal in the two coils.

The same procedure is followed next in adjusting the 15/20-meter reflector, but using frequencies of 20.35 and 13.6 Mc. The 10/20-meter director (Element C) is adjusted similarly for frequencies of 20.5 and 14.85 Mc. Adjustments of antenna resonance and the gamma matching sections were made with the aid of an "antenna scope."

Performance of the beam compares very well with a standard 2-element short beam on 10 and 15 meters. Estimated gain is at least 4 db. On 20 meters, performance equals or better a well-known 3-element center-loaded commercial short beam which we have had in use here for the last four and one half years. Checks with an s.w.r.

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Fig. 3—Details of the 20-meter loading coils and series-tuned shunts. The loading coil $L_1$ has 18 turns No. 12 wire wound at the center of a 1-inch hardwood dowel to a length of 4 inches. The ends of the dowel extend 4 inches into each section of the element, the total dowel length being 12 inches. Coils $L_2$ have 12 turns of No. 12, 3/4 inch in diameter. Turns spacing is adjusted as necessary. The capacitor $C_1$ is composed of two lengths of aluminum tubing with a section of polystyrene tubing as the dielectric. Capacitance can be adjusted by sliding the 1/2-inch inner tubing back and forth. Maximum capacitance is approximately 35 $\mu$F. Other suggestions for capacitor construction will be found in footnote references.

bridge after final adjustment indicated an s.w.r. of less than 1.5 to 1 over the 10- and 15-meter bands. As might be expected, the loaded 20-meter elements caused some rise in the s.w.r. at the high and low ends of the band, but held within less than 1.5 to 1 over the range of 14,150 to 14,300, when the tuning was centered on the phone band.

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**New Apparatus**

*Esico Gunchoke*

The formidable looking object shown in the photograph is not a shotgun accessory as its name might imply. Instead, it is a power reducer that is inserted between the a.c. line and a soldering gun, for use when soldering printed circuits and laminated wiring boards. Using the gun with full-on heat could damage the delicate printed circuits.

The Gunchoke reduces temperatures of soldering guns to two selectable temperatures of 500 or 600 degrees Fahrenheit. Selection is made by simply plugging the soldering gun into either one of two sockets provided at one end of the Gunchoke. The soldering gun (or a conventional iron of equivalent wattage) takes slightly longer to heat up to the required temperature when the device is in use: the time lag varies from 25 to 40 seconds depending upon the type of iron or Gunchoke. Several models are available for almost every widely-used gun.

The Gunchoke measures about 6 inches long and 2 inches wide and is manufactured by the Electric Soldering Iron Co., Inc., Deep River, Conn.

—E. L. C.

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**&-Strays**

Ernest T. Rosing, W0ZZU, is looking for fellow hams who were in the submarine service during World War II. Rosing, second vice president of the U.S. Submarine Veterans of World War II, says the group is planning a big reunion in San Diego, Calif. next August. Meanwhile, he'd enjoy some ragchewing about old underwater days.

How many times have you had a QSO fouled up because of key clicks from some other station? You've probably had it happen often, in spite of the fact that clicks are prohibited by the amateur regulations. What you probably don't know is that there is a simple way of getting rid of the problem. No, you don't have to chop down the other guy's antenna — although you probably would like to!

This "way" is a simple device, called an audio limiter, that can be plugged into the headphone jack on your receiver. Not only will it help on clicks, it will also serve as a noise limiter for certain types of noise, including the popping type of noise you get from spark plugs and electrical switches. The limiter has another useful function in that it tends to hold very strong c.w. signals down to a comfortable listening level. If you use your own receiver for monitoring your sending, as many hams do, the limiter eliminates the necessity for changing the gain-control setting of your receiver when you transmit.¹

How It Works

The circuit of the limiter is shown in Fig. 1. The unit consists principally of two 1N34 diodes, two penlite cells, a resistor, and a switch. All the components are mounted in a small metal box which is equipped with a phone jack and plug.

¹ Providing, that is, that the receiver, with the gain controls set for normal reception, is capable of giving a satisfactory beat tone on your transmitted signal. Many receivers are overloaded so badly that the beat note either isn't heard or is chirpy. — Editor.

The plug is inserted into the headphone jack on the receiver and the headphones into the unit. No modifications are necessary as far as the receiver is concerned because the limiter is entirely external.

As you probably have observed when listening to c.w. signals on your communications receiver, the signals reaching the headphones will vary considerably in amplitude. They will range from ear-busting loud ones to very weak signals. When the receiver is switched for a.m. phone reception this condition is not as noticeable because nearly all communications receivers have automatic volume control for a.m. reception and the a.v.c. holds the stronger signals down to a comfortable listening level. However, when switched to c.w., most receivers have no provision for automatic gain control and the stronger signals blast through. Many hams maintain a comfortable listening level by "riding" the gain controls on their receivers. With the audio limiter connected to the receiver any signals that exceed a certain level are automatically clipped.

The diodes, CR₁ and CR₂, are back-biased by 1½ volts from the penlite cells. With this bias voltage the diodes are normally nonconducting. When a signal from the receiver exceeds the bias voltage the diodes conduct, putting a short circuit across the headphones for all voltages above the bias level. There is no limiting action when the signal voltage is below the bias voltage on the diodes. One diode clips the positive signal peaks and the other, the negative.

The limiter circuit as shown works best with high-impedance headphones, 2000 ohms or more. Many of the headphones that were available on

For what it costs in time and money, an "ear-saver" simple audio limiter is one of the best investments you can make for operating comfort in c.w. work. It's useful in other types of reception, too.
the surplus market are the low-impedance type and the clipper will not work well with these unless a step-down transformer is used. (A tube-to-line output transformer having 500-ohm output is suitable. The headset should be connected to the 500-ohm winding. The high-impedance winding can be connected to a phone plug to go into J1.) Also, the clipper will not work when a speaker voice coil is plugged into J1.

Construction and Wiring

The unit shown in the photograph was constructed in a 2½ x 2½ x 4-inch Minibox. However, any convenient size box or chassis can be used as neither the dimensions nor layout are critical. The penlite cells are held in place by a small bracket, secured by a screw and nut that also holds a two-terminal tie point. If desired, battery holders can be used for the cells, but it was felt that the extra expense wasn’t warranted in this unit.

The leads from CR1 and CR2 are soldered directly to the penlite case (negative) and tip (positive), respectively. If you happen to get the type of cell that has a foil wrapping, take it out of the wrapping so you can solder directly to the case, because the contact between the cell case and the disk at the bottom of the wrapping is poor unless there is pressure on the bottom. Wrap the bare cell case with tape, if necessary, to avoid short circuits.

When soldering a diode lead, hold the lead with metal pliers near the point being soldered. This will serve to conduct any heat away from the diode. This is important because it is very easy to ruin the diode if too much heat reaches it.

How To Use It

To use the limiter, simply plug it into the receiver phone jack and plug your headphones into J1. Set your receiver gain controls as you normally operate them, and then tune across the band with limiter switched off. Next, switch in the limiter and go across the band again. You should immediately note the difference, since the stronger signals will be held to one level and any noisy clicks should be suppressed to the point where they are hardly noticeable.

In this simple limiter circuit there is no control over the maximum headphone volume, because the peak signal voltage is set by the bias voltage (1.5 volts in this case) on the clipper diodes. As it happens, this represents a signal level that is satisfactory to most operators. The fact that the clipper bias is not adjustable simply means that the overall signal level has to be fitted to the clipper, for optimum results. The optimum con-

The simplicity of the audio limiter is apparent from this interior view. The headphone jack is on the end at the top in this view. The two flashlight cells are clamped to the case by the small bracket, above which the two diodes and the series resistor can be seen. The cord to the phone plug (ordinary lamp cord is suitable) can be any convenient length.

January 1960
Johnson Viking 6N2 Thunderbolt

Those familiar with the Johnson Viking Thunderbolt, will realize, after a glance at the photographs shown on these pages, that there is something new and different about the v.h.f. version. The most obvious feature of the 6N2 model is the unique r.f. circuitry which is contained in a special silver-plated r.f. compartment.

The amplifier is designed for bandswitched coverage of the amateur 6- and 2-meter bands. It uses two 7034 power tetrodes connected in parallel and contains its own high-voltage plate, screen and bias supplies. It is capable of the maximum legal input on both bands when operated Class C. It can also be operated Class AB1 for s.s.b. or d.s.b. emission at the legal input. If a.m. linear operation is desired, the amplifier may be biased for AB1 operation at reduced input. Drive requirements for the amplifier are about 5 watts for Class AB1 linear operation or about 8 watts for Class C.

Fig. 1 shows a simplified diagram of the 6N2's r.f. input circuitry. Although the input is switched from the front panel for 6- or 2-meter operation, the grid circuit is actually a multiband circuit; the switching action simply connects the proper link to couple energy into the network. Fig. 2 is a simplified diagram showing how the multiband input circuit appears on the two bands. On six meters, the circuit is a conventional parallel-tuned circuit with \( L_4 \) and \( C_4 \) forming the resonant circuit. Inductance \( L_4 \), which is a two-turn strip coil (see photographs), appears on six meters as a "hunk of connecting wire" which joins the tuned circuit to the grids. However, on two meters the circuit becomes series tuned with \( L_4 \) being the tank inductance. The 6-meter tank, \( L_4C_4 \), has capacitive reactance on this frequency, and varying \( C_4 \) tunes the series circuit much as if \( L_4 \) were not present. However, \( L_3 \) provides a convenient means for coupling drive power into the 2-meter circuit.

Simplified diagrams of the 6- and 2-meter plate tank circuits are also shown in Fig. 2. The output circuit will match transmission-line impedances of 30 to 300 ohms. On 6 the tank is easily recognizable as a pi network. The tank inductance, \( L_6 \), is a five-turn coil wound with silver-plated tubing (see photographs). When changing to two meters \( L_6 \) is shorted out, leaving in the circuit a coaxial line consisting of a large-diameter silver-plated cylinder as the inner conductor and the shield box as the outer conductor (on 6 meters the cylinder acts merely as a

Fig. 1 — Simplified diagram of a portion of the 6N2 Thunderbolt transmitter's r.f. section. Capacitances are in \( \mu \)f. Capacitor \( C_1 \) is the grid tuning control, \( C_4 \) and \( C_6 \) are in the bridge neutralizing network and \( C_{R1} \) is the grid-circuit parasitic suppressor.

\(^1\) QST, "Recent Equipment," July 1958.
connecting lead between the tubes and the 6-meter inductance, $L_0$. The r.f. compartment box is also silver-plated. Since the line is short it has inductive reactance, and it operates as a high-Q tank coil in a pi network. The same input and output capacitors used in the 6-meter pi also are used on two meters, but since the plate tuning capacitor $C_4$ has a relatively large capacitance for two meters (25 µf) it is tapped down slightly on the line which is labelled $L_4$ in Fig. 2. Use of the high-Q coaxial line on two meters boosts the efficiency of the amplifier. The manufacturer claims that losses on 144 Mc. are only about 5 per cent of the total tube output.

To insure stability in the amplifier, Johnson uses a parasitic suppressor in the grid circuit (see Fig. 1). It consists of an RCL network which includes $C_4$ and $R_1$ in shunt with the inductance of the grid-lead strap which, although small, is not negligible at 144 Mc. This network, along with the two 15,000-ohm grid loading resistors, can be seen in the close-up view of the grid circuit. In addition to the parasitic suppressor the amplifier also has capacity-bridge neutralization, using capacitors $C_3$ and $C_6$, Fig. 1, as part of the bridge. Capacitor $C_4$ is a small post that comes up between the two 7034 tubes from the lower grid compartment.

The grid circuit r.f. bypass capacitor, $C_2$, is a metal plate, about $3\frac{3}{4} \times 3\frac{1}{2}$ inches in dimensions, separated from the chassis by a sheet of plastic dielectric. All leads in the grid circuit requiring an r.f. ground return are physically connected to this capacitor.

The Thunderbolt plate power supply delivers about 2000 volts under full load. Screen voltage is obtained from the plate supply through a screen-dropping resistor and is regulated by a string of VR tubes. Bias for the amplifier is supplied by a combination bias-filament transformer which delivers heater voltage to the final amplifier tubes, filament voltage for the 806AX rectifiers, and 115 volts for the bias rectifier.

A selenium diode half-wave rectifier is used with a capacitor-input LC filter in the bias supply circuit and is regulated by a VR tube.

Adequate filtering in the high-voltage circuit is insured by a 5- to 25-henry swinging choke and six series-connected 80-mf. electrolytic capacitors. Safety features are not overlooked either. The transmitter incorporates an interlock that shortens the high-voltage circuit when triggered. Also, the plate-current meter is connected between chassis and the negative high-voltage output terminal of the supply.

This view underneath the chassis of the 6N2 Thunderbolt shows the separate r.f. compartment at the top with its cover plate removed. Three of the six filter capacitors, which are mounted on a phenolic board, can be seen at the bottom next to the rectifier filament transformer. For cooling the final amplifier tubes and circuitry, air is sucked into the lower compartment in the photograph through a group of holes spaced at intervals in the chassis, then pumped into the r.f. compartment by the squirrel-cage blower. In the pressurized r.f. compartment the air is forced to flow through special tube sockets and chimneys and cools the tubes and output-circuit components above the chassis.
The power supply is wired for operation from a 3-wire single-phase 230-volt power source but, if necessary, it can be wired to operate from single-phase 115-volt power. In either case, the maximum power demand at full output doesn't exceed about 1600 watts.

Controls and meters on the 6N2 Thunderbolt include a plate-current/power-input meter calibrated in both milliamperes and amplifier power input (for a plate voltage of 2100 volts). A second meter can be switched to show grid current, screen current, plate voltage, or r.f. output voltage. The latter is measured with a shunt diode rectifier tapped down across the amplifier r.f. output circuit. Fig. 3 shows the voltmeter circuit.

A toggle FIL switch controls the filament and bias voltages while a PLATE toggle switch turns on the plate and screen voltages. Jumper pilot lamps are mounted above each switch to indicate “on.” The MODE switch selects the proper bias and screen voltages for the three positions of CW, TUNE, and LINEAR. The CW position is used for Class C operation while TUNE permits tuning and loading of the amplifier at reduced input. For A.M., S.S.B. and D.S.B. operation the switch is turned to LINEAR. Two band switches are necessary, one for the plate circuit and one for input switching. The GRID INPUT switch, in addition to shifting the input link for 6- or 2-meter operation, also allows selection of three resistances, 60, 100 or 200 ohms, to act as “swamping” resistors across the input circuit when the amplifier is operated as a linear. GRID TUNING and PLATE TUNING controls are provided, plus a COUPLING control for adjusting the amplifier loading.

![Fig. 3](image)

**Fig. 3**—Relative r.f. output is measured in this shunt diode detector circuit. The diode CR is placed across the capacitive divider so that it “sees” only about 1/200th of the total power. Capacitances are in μF.

The 6N2 Thunderbolt is housed in a perforated metal maroon-finished cabinet (not shown in the photographs) which measures about 21 inches wide, 11⅛ inches high and 16⅞ inches deep. To suppress spurious radiation all surfaces between the one-piece cabinet and panel make positive electrical connection when fitted together. The indicating meters are electrically outside the shielded cabinet and so their leads have r.f. filters. The a.c. line connections and outside control connections are also equipped with r.f. filters for TVI suppression. The total weight of the amplifier is about 120 pounds. It is manufactured by the E. F. Johnson Co., Waseca, Minnesota.

—E. L. C.

The coaxial tank output circuit with the compartment cover removed. The 7034 amplifier tubes are at the bottom of the photograph. The coil above the right-hand tube is the plate r.f. choke. The large cylinder running almost the length of the compartment is the center conductor of the 2-meter coaxial line while the coil at the top end of the box is the 6-meter tank inductance. For 2-meter operation the latter coil is shorted out by the ceramic wafer switch at the top.

Output capacitor C is just below this switch. The plate tuning capacitor cannot be seen in this view but is located under the 2-meter cylinder. Most of the components, as well as the surfaces of the compartment, are silver-plated.
26th ARRL International DX Competition

Phone: Feb. 5-7 and Mar. 4-6;
C. W.: Feb. 19-21 and Mar. 18-20

Yes, DX Contest time is right around the corner again. Amateurs throughout the four corners of the globe are invited to participate in the 26th ARRL International DX Competition. This is the chance for WAVE stations to chalk up new countries for DXCC, and for other amateurs to put the finishing touches on WAS and WAVE. Your entry in this four week affair will ensure you a flock of frolic and fun.

There is one change in the rules this year. Alaska (KL7) and Hawaii (KH6) by virtue of now being states of the United States will no longer be counted in the DX contingent, but will be working the rest of the world along with the other W and VE stations. That makes a total of 21 licensing areas for which the DX amateurs will have to be on the lookout. DX amateurs remember: KL7 and KH6 now count for you!

Certificates are offered to the top single-operator phone and c.w. scorer in each country and ARRL section. A special category recognizes multi-operator stations in sections and countries from which at least three such entries are received. Also within ARRL-affiliated clubs, single-operator members may compete for certificates for the highest c.w. and phone efforts. A gavel will again be on the block, to be awarded to the club which compiles the highest aggregate score.

The award and scoring system is designed to encourage the widest use of our bands; so flexibility of operation is the thing (no certificates are offered for one-band work). Repeat QSOs on additional bands are permitted. For example, when W5ECR and PA9LZ exchange contest information on 10, 15, 20, and 40 meters, the contact-point total, multiplier, and score rise for both entrants. For the DX, the multiplier is the sum of the U. S. A.-Canada licensing areas worked per band, while the W/VE multiplier consists of the sum of different countries (see ARRL Countries List, p. 53) contacted per band. No credit for W/VE-to-W/VE QSOs is allowed.

It is suggested that W/VE e.w. entrants refer to this tabulation in indicating states and provinces. Overseas competitors may use it as a check-off list of states and provinces and for logging abbreviations.

W7 — CONN MAINE MASS NH RI VT
W2 — NJ NY
W3 — DE MD PA DC
W4 — ALA FLA GA KY NC SC TENN VA
W5 — ARK LA MISS NMX OKLA TExAS
W6 — CAL
K16 — HAWAII
W7 — ARIZ IDAHO MONT NEV ORE UTAH
WASH WYO
K17 — ALASKA
W8 — MICH OHIO WVA
W9 — IN WIS
W0 — COLO IOWA KANS MINN MO NEBR
NDAK NDAK
W61 — NB NS PEI
W62 — QUE
W63 — ONT
W64 — MAN
W65 — SASK
W66 — ALTA
W67 — BC
W68 — NWT YUKON
W9 — NFLD LAB

U. S.-Canadian amateurs have quotas on e.w. (see rule 10) but none on phone. DX amateurs have no quotas; they will QSO as many stations as they can in the 21 W(K) and VE/VO licensing areas on each band. Note: With the addition of Alaska and Hawaii there are now 21 areas.

Keep your log neatly and carefully and send a copy to ARRL, in the form shown, as soon as the contest ends. It must be postmarked by April

EXPLANATION OF DX CONTEST EXCHANGES

<table>
<thead>
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<th>Stations in U. S. and Canada Send:</th>
<th>RS or RST Report of</th>
<th>Your State or Province (or Abbreviation)</th>
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<td>Sample (phone)</td>
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</table>

January 1960 49
Sample of report form that must be used by W/VE c.w. participants. When a station is worked for less than the maximum number of points allowed, the additional contact to make up the points not earned in the first contact should be entered at the bottom of the sheet. Canadian entrants should allow two blocks for each country, but may record no more than eight contacts therein. A separate set of sheets should be used for each band.

30, 1960, to be eligible for awards and QST listing. No matter how small your report, it is welcome. Convenient sheets are now available free on request from the ARRL Communications Dept.

Mark the dates on your calendar, check the rules below carefully, get your rig in tip-top shape for action, and stand by for the 1960 ARRL International DX Competition scheduled for February and March.

**Rules**

1) **Eligibility**: Amateurs operating fixed amateur stations in any and all parts of the world are invited to participate.

2) **Object**: Amateurs in the United States and Canada will try to work as many amateur stations in other parts of the world as possible under the rules and during the contest periods.

3) **Conditions of Entry**: Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

4) **Entry Classifications**: Entry may be made in either or both the phone or c.w. sections; c.w. scores are independent of phone scores. Entries will be further classified as single-people, single-band, and station classes.

**LOG, 26th INTERNATIONAL DX COMPETITION**

<table>
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<th>Received</th>
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<td>France</td>
<td>G2CP</td>
<td>2/20</td>
<td>1300</td>
<td>599CONN</td>
<td>459150</td>
</tr>
<tr>
<td></td>
<td>G4RIJ</td>
<td>2/21</td>
<td>1245</td>
<td>597CONN</td>
<td>460125</td>
</tr>
<tr>
<td></td>
<td>G2KP</td>
<td>2/21</td>
<td>1355</td>
<td>599CONN</td>
<td>579100</td>
</tr>
<tr>
<td></td>
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<td>3/19</td>
<td>1430</td>
<td>499CONN</td>
<td>559100</td>
</tr>
<tr>
<td></td>
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<td>3/20</td>
<td>1822</td>
<td>598CONN</td>
<td>599125</td>
</tr>
<tr>
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<td>G5ABO</td>
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<td>1885</td>
<td>499CONN</td>
<td>450075</td>
</tr>
<tr>
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<td>440050</td>
</tr>
<tr>
<td></td>
<td>DL1BZ</td>
<td>2/21</td>
<td>1149</td>
<td>499CONN</td>
<td>559090</td>
</tr>
<tr>
<td></td>
<td>DJ2KR</td>
<td>3/19</td>
<td>1002</td>
<td>599CONN</td>
<td>550015</td>
</tr>
<tr>
<td>Germany</td>
<td>G2CP</td>
<td>2/20</td>
<td>1300</td>
<td>599CONN</td>
<td>459150</td>
</tr>
</tbody>
</table>

Sample of report form that must be used by W/VE phone entrants and all participants outside U. S. and Canada, phone and c.w. This example is a U. S. A. phone log. Foreign competitors, of course, would have reverse information in the "Sent" and "Received" columns; their "Received" column would show exchanges like "579CAL," "589PONT" (or, on phone, "46 Vermont," "58 Georgia," etc.), indicating signal reports received and different states and provinces worked; their "Sent" column would carry signal reports and power indicators transmitted.

**LOG, 26th INTERNATIONAL DX COMPETITION**

<table>
<thead>
<tr>
<th>Date &amp; Time GMT</th>
<th>Station Worked</th>
<th>Country</th>
<th>Record of New Countries for Each Band</th>
<th>Exchange</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 6</td>
<td>U2BU</td>
<td>Estonia</td>
<td>1</td>
<td>58 Maine</td>
<td>57080</td>
</tr>
<tr>
<td>Mar. 5</td>
<td>ZLING</td>
<td>New Zealand</td>
<td>2</td>
<td>58 Maine</td>
<td>58075</td>
</tr>
<tr>
<td>Feb. 7</td>
<td>PABHBO</td>
<td>Netherlands</td>
<td>1</td>
<td>58 Maine</td>
<td>47075</td>
</tr>
<tr>
<td>2/20</td>
<td>ZL1MQ</td>
<td>New Zealand</td>
<td>1</td>
<td>58 Maine</td>
<td>50090</td>
</tr>
<tr>
<td>2/21</td>
<td>VZ3K</td>
<td>Australia</td>
<td>2</td>
<td>58 Maine</td>
<td>57750</td>
</tr>
<tr>
<td>3/10</td>
<td>ZL1MQ</td>
<td>New Zealand</td>
<td>2</td>
<td>58 Maine</td>
<td>50090</td>
</tr>
<tr>
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<td>VK3MX</td>
<td>Australia</td>
<td>2</td>
<td>58 Maine</td>
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</tr>
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<td>New Zealand</td>
<td>2</td>
<td>58 Maine</td>
<td>50090</td>
</tr>
<tr>
<td>4/20</td>
<td>ZL1MQ</td>
<td>New Zealand</td>
<td>2</td>
<td>58 Maine</td>
<td>57750</td>
</tr>
<tr>
<td>5/25</td>
<td>RA2VE</td>
<td>Spain</td>
<td>3</td>
<td>57 Maine</td>
<td>57050</td>
</tr>
<tr>
<td>5/25</td>
<td>G2JYV</td>
<td>England</td>
<td>3</td>
<td>57 Maine</td>
<td>57050</td>
</tr>
<tr>
<td>6/25</td>
<td>G2JYV</td>
<td>England</td>
<td>3</td>
<td>57 Maine</td>
<td>57050</td>
</tr>
<tr>
<td>7/25</td>
<td>G2JYV</td>
<td>England</td>
<td>3</td>
<td>57 Maine</td>
<td>57050</td>
</tr>
<tr>
<td>8/25</td>
<td>YN1CB</td>
<td>Nicaragua</td>
<td>4</td>
<td>58 Maine</td>
<td>58500</td>
</tr>
</tbody>
</table>

**QST**
SUMMARY, 26th A.R.R.L. INTERNATIONAL DX COMPETITION

Entry Call...................................................... A.R.R.L. Section.................................................. or Country.
(C.W. or Phone)

Name............................................................ Address.................................................................

Transmitter Tube.................................................. Power Input......................................................

Receiver.......................................................... Inten(no(s)....................................................

(Logs from W/K and VE/VO show number of foreign countries worked. Logs from other countries show number of U.S.A. and Canadian calls direct worked.)

<table>
<thead>
<tr>
<th>Bands</th>
<th>1.5 Mc.</th>
<th>3.5 Mc.</th>
<th>7 Mc.</th>
<th>14 Mc.</th>
<th>21 Mc.</th>
<th>28 Mc.</th>
<th>50 Mc.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Countries QSO'd</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
<td>10^4</td>
</tr>
<tr>
<td>No. of Contacts</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

Number of Different Countries Worked..................................... Number of Hours of Station Operation ....................................

Assisting Person(s): Name(s) and Call(s)....................................

389

<table>
<thead>
<tr>
<th>(Points)</th>
<th>(Multiplier)</th>
<th>FINAL SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Participation for Club Award in the ____________________________

I certify, on my honor, that I have observed all competition rules as well as all regulations established for amateur radio in my country, and that my report is correct and true to the best of my belief. I agree to be bound by the decisions of the A.R.R.L. Award Committee.

Operator's Signature and Call ...........................................

Sample of summary sheet that must accompany all reports.

or multiple-operator stations. Single-operator stations are those at which one person performs all the operating functions. Multiple-operator stations are those obtaining assistance, such as from "spotting" or relief operators, or in keeping the station log and records.

5) Contest Period: There are four week ends, each 48 hours long: two for phone work and two for c.w. The phone session starts at 2400 GMT, Friday, February 5 and Friday, March 6. The c.w. session starts at 0000 GMT, Friday, February 19 and Friday, March 22.

6) Valid Contacts: In the phone section, all claimed credits must be made voice-to-voice. In the telegraph section, only c.w.-c.w. contacts count. Crossband contacts may not be counted.

7) Exchanges:
a) <i>Amateurs in U. S. and Canada</i> will transmit a three-figure number, representing the RST report, plus their state or province. (The latter may consist of an appropriate abbreviation.) Phone participants will transmit a two-figure number consisting of the readability-strength report plus the state or province. Example: W6YF might transmit "596CAL," on c.w., "596 California" on phone.
b) <i>Amateurs outside W (K) and VE/VO</i> will transmit six-figure numbers, each consisting of the RST report plus three "power" numbers: the power indicator will represent the approximate transmitter power input. Phone contacts will transmit five-figure numbers, each consisting of a readability-strength report and the three "power" numbers. Example: VK2GW, with 100 watts input, might transmit "5901000" on c.w., "590100" on phone. If the input power varies considerably on different bands, the "power" number should be changed accordingly.

8) Scoring:
a) Points: One point is earned by a W (K) or VE/VO station upon receiving acknowledgment of a contact exchange sent, and two points upon acknowledging an exchange received. Two points are earned by any other station upon receiving acknowledgment of a contest exchange sent, and one point upon acknowledging an exchange received.
b) Final Score: W (K) and VE/VO stations multiply total points earned under Rule 8(a) by the sum of the number of W (K) and VE/VO licenses held in the United States (W1-8, KH6, KL7), 9 in Canada (VO, VE1-VE8). [See Countries List on p. 58 — Fo].

REMEMBER

<i>DX Stations</i>: Alaska (KL7) and Hawaii (KH6) can now be worked, making a total maximum multiplier of 21 for any one band.

<i>KL7's & KH6's</i>: You now work DX stations only. VE and other W contacts do not count.

<i>W/VE Stations</i>: KL7 and KH6 contacts do not count.

January 1960
WHAT'S THE SCORE?

BY

Western Pennsylvania Multispot Station W3A0H
(W3A0H, LAM, MIVQ, QJ4, UH9, YKD and K3DKD)

Having read the results and got quite a jolt, We "seven ops" wonder just who's the doll. Who tooted the scores and failed to see, As listed on page 61, October QST? That W3A0H with its seven ops, In multispot phone, came out as tops? Instead, on page 54, you will see, A worthy competitor, and a W-three, Is far out in front and deserves some acclaim, As winner and champion of this phone DX game. Our score of 417 thousand three hundred twelve Is hardly one you can conveniently shell out, Are all our efforts to go so nought, No recognition for the battle fought, And won, as we see it, fair and square, A gruelingly ninety hour grind on the air, With parties and thrusters and some fancy passes? We think ye old contest editor needs glasses There's no way of knowing what your answer may be, But seven ops, W three, say seventy-three, If a correction is issued, despite the late date, We'll drop all discussions and go eighty-eight!

A "hammy" wedding was performed recently with K0AUS as groom, KOMBL as best man, and K0UIC officiating.

Coincidence Department: WSGBH lives in Belleire, Ohio — W5GBH lives in Belleaire, Texas.

———

QST for January 1935

... W51IQ won the second annual WVU contest with 22,410 points. WSGBT led the United States with 7,938.

... Ross Hull reported a new triumph on 56 Mc. — hams from Montclair, N. J. and Yonkers, N. Y. reached beyond Boston. A reader suggested dissolving celluloid from an old toothbrush handle in lumps of oil (easily available from hardware dealers) to make a quick-drying coil dope.

... W3ID, 20-year-old Thomas A. Bonham of Andover Pa., constructed a complete station, including a portable outfit, entirely by himself — although Tom was totally blind from infancy. W3ID is still active today.

Technical articles included a new, simpler circuit for obtaining voice-controlled carrier power... a design of high-frequency stages for the amateur superhet... and George Grammer's description of a 50-watt transmitter combining modern and less-modern circuits for multi-band operation.

And the new Radio Amateur Calendar was advertised as hot off the presses for $1.25, or 50c for the year.

FEEDBACK

In the circuit diagram of Fig. 1, page 31 of the November issue, the arm of switch S1 should go to ground, rather than to the positive side of the I-µF capacitor as shown.

With reference to the transistor modulator described on page 24 of the November issue, W6HQT of the Bircher Corporation tells us the Bircher Type 3B415 is not audionized and so does not provide the necessary electrical insulation.
PORTABLE ANTENNA MAST

This 40-foot vertical mast shown in Fig. 1 is extremely simple to construct and lightweight, yet has sufficient strength when properly guyed to support almost any Field Day antenna. The mast is constructed of 3-inch o.d. aluminum irrigation pipe cut into three sections each, approximately 14 feet long. The pipe is available from Sears, Roebuck and Company in 20- and 30-foot lengths and in diameters of 2, 3 and 4 inches and can be found listed in the Sears Farm Equipment catalog. The pipe joints are made by cutting a 1/8-inch slot lengthwise through two 3-foot sections. These slotted sections are then compressed until they will slide into the full-sized pipe at the two joints. Eight sheet-metal screws at each top joint hold the sections and sleeves together.

Fig. 1 — K6QHZ's portable mast.

Ground support for the mast is provided by a 3-inch diameter section of treated fence post forced a few inches into the pipe. Of course, the mast can be placed on a flat board or hard surface instead. A wood insert is forced into the top section to provide mounting for four guy blocks which are screwed through the tubing and into the block.

After the mast is assembled on the ground, it can be swung into position by one man while assistants stake and place the guys. Disassembled, the tower can be made up into a simple bundle that can be tied to the side of a car. If the mast is going to be used for Field Day activities, the joints should be coated with vaseline to facilitate easy assembly and disassembly.

— R. Bunce, K6QHZ

USING DYNAMIC SPEAKERS

If you have an old electrodynamic speaker in your junk box it can be put to good use as a shack speaker. All that's needed is a straight-forward half-wave rectifier circuit to power the speaker field coil. Such a circuit is shown in Fig. 2. For safety reasons, care should be taken to isolate the circuit from ground and all leads should be insulated.

It is a good idea to check the d.c. resistance of these speakers since some of them were used with automobile broadcast receivers where the field coil was excited with the car's primary voltage. These car speakers will have a low-resistance coil and are not applicable for use with the circuit in Fig. 2.

— John P. Stockes, K5SOIF

USEFUL WASHERS

A heavy semihard rubber washer, 3/4 inch thick, with one tapered side and one flat side (intended for closet-bowl drain use) makes a snug fit around two-inch pipe. It can be used to protect antenna rotators or the like from moisture and dust (see Fig. 3). The washers can probably be obtained from most hardware or plumbing-supply stores.

— Dr. George B. Bean, W5DVI/K5KUR

Fig. 2 — Power supply suitable for use with dynamic speakers.

CR1 — 150-ma. rectifier.

Fig. 3 — Rubber washer protects rotator housing from moisture and dust.
INEXPENSIVE ANTENNA WIRE

Electric fence wire (Sears, Roebuck catalog No. HR 7785) is an inexpensive source of No. 18 copperweld antenna wire. About ten dollars will get you a ½-mile roll!

— R. C. Bianc, K6QHZ

ONE-TUBE CRYSTAL-V.F.O. INPUT CIRCUIT

There are several types of oscillator circuits which make good crystal oscillators, but when these circuits are used following a v.f.o. they become temperamental and sometimes unstable. The circuit shown in Fig. 4 is a crystal-oscillator, grounded-grid amplifier which, with the flick of a switch, becomes a cathode-follower, grounded-grid amplifier for v.f.o. operation.

— Patrick B. Hamel, K8DJK

MORE SWEEP VOLTAGE FOR THE ELECTRONIC EYEBALL

The article "The Electronic Eyeball" in QST, January 1959, stirred my desire to build a panoramic adapter. After building the unit, I found that I could not get enough sweep voltage from the 12AX7 tube for full linear horizontal deflection.

Fig. 5—Modified sweep circuit for the Electronic Eyeball
All resistors are ½ watt unless otherwise specified.

I gave the problem some thought, thumbed through tube data and then decided to use a 6J8 in place of the 12AX7. The results were gratifying. I had almost twice the linear sweep voltage that I had before. The new circuit for the oscillator-amplifier is shown in Fig. 5. The only additional voltage required is 150 volts regulated for the screen of the pentode section.

— Donald C. Hanna, VE2CD

OSCILLOSCOPE CIRCUIT

Many homemade oscilloscopes do not include sweep, sync, or amplifier circuits. Sometimes, however, these circuits are necessary for ham measurements, and they can be added readily to an existing scope which contains its own power supply. Fig. 6 shows a simple circuit that includes vertical and horizontal-amplifier and sawtooth-oscillator circuits. The only power necessary other than heater is 300 and 400 volts at about 25 ma. — C. O. Williamson, W8HHZ

Fig. 6—Oscilloscope circuits—(A) sawtooth oscillator, (B) horizontal amplifier, and (C) vertical amplifier. All capacitances are in μf. Those marked with polarity are electrolytic. Resistors are ½ watt unless otherwise indicated. Terminals V and H are connected to the vertical and horizontal plates of the cathode-ray tube.
The author

Pertinent Factors and
Suggested Techniques

BY DONALD McCLENON, W3EIS

So You Want to Win a Contest!

In this era of skyrocketing interest in contests, few experts are as qualified to discuss the subject as W3EIS. McLenon won seven of the last nine c.w. Sweepstakes awards in highly competitive Md.-Del.-D.C. Section, placing fourth nationally last year, and co-holds the all-time score/contact record among two-man Field Day portables. He is currently president of Washington’s Potomac Valley Radio Club, possessors of a sizable stack of contest gavels. This article is an updated version of a talk delivered at the 1958 ARRL National Convention.

There are some regularly scheduled amateur radio contests which are so popular that nearly all other on-the-air activity ceases when they are in progress. These include ARRL’s Sweepstakes, International DX Competition, and Field Day. It should be evident that these events develop operating proficiency, demonstrate desirable station improvements, and foster emergency preparedness. Probably the biggest attraction, however, is that contests are a lot of fun. The enjoyment to be derived will usually be greater if the participant is doing well, which usually means he is running up a good score. This discussion will deal with certain important techniques contributing to good scores in the three events mentioned, and will supplement the excellent recommendations given in W9IOP’s article.¹

The Sweepstakes

In the SS, an amateur located in any of the 73 ARRL Sections attempts to contact as many others in as many of these sections as possible in the 48 hours of operating time allowed him during the 48-hour contest period. Stations must exchange six elements of information to obtain points for the contact. These multiplied by the number of sections worked and the power multiplier (if applicable) give the score. Once a station has been worked he may not be reworked on any other band. A prime feature of the contest is the QSO serial number sent during each contact, which tells how many stations you have worked up to this point and likewise lets you know how the station contacted is doing. You may take time out whenever you like until you have used up the 48 on-the-air hours or the two weeks.

Just knowing someone’s contact total does not appear to make possible the determination of his score, because his multiplier is unknown. This can be obtained with surprising accuracy with the technique to be described, an extension of which also helps plan future contest strategy.

The results of SS operation by thousands of amateurs have been tabulated in QST. When an operator’s score is plotted against his total contacts, a smooth curve may be drawn through the area of greatest density of those points, with about as many on one side of the line as on the other. Such a line represents the performance of the average SSer, regardless of how well or poorly he does. Better performance simply moves him farther up the line. This is the typical score buildup of Fig. 1. Since we have found that the average participant with a given number of contacts must have a certain score, he must also have a corresponding number of contacts as shown in the ‘sections’ scale of the figure.

Those who stay on one band for long periods or who work only the stronger signals will have lower than average scores for their contact totals and their results will appear below the line in the ‘rag chewers’ region. Those who spend a lot of
time seeking out new sections and allow their contact totals to fall slightly in the 'DX men' portion above the line. In this curve, all participants start at zero and the points spread further and farther on each side of the line up to about 350 contacts, after which they converge again to the line at about 1000 QSOs, because anyone with this many is likely to have practically all the sections.

Fig. 1 is exponential up to about 200 contacts and essentially linear thereafter. This is true whether one takes the entire 40-hour period to make his 200 contacts or does it in the first five hours. Actual scores usually go in 'steps' when several new multipliers are obtained close together, but the scores alternate above and below the line of Fig. 1.

With the aid of Fig. 1, it is possible to estimate the final score of most of those worked. You determine the ratio of his number to yours when you work him. At the end of the contest you multiply your final number of contacts by this ratio to obtain his final contact total and read his final score from Fig. 1 using his QSO total. This technique applied to all club members enables the Potomac Valley Radio Club and the Frankford Radio Club to know who won the gavel for the highest scoring club a day after the contest is over, and thus avoids the six months of suspense while awaiting publication of the official word.

The assumptions made in using this method are that (1) both stations have used about the same amount of time, (2) both follow a normal pattern in making contacts, (3) neither has any serious equipment breakdown, (4) the other fellow is in the 150-watts-or-less class, will operate the full 40 hours, and keep a fairly accurate duplicate check, (5) he sent a true consecutive number and (6) he will postmark his log by the mailing deadline. This method of prediction is inaccurate the first few hours because the other chap may have started late, or you might be off to a slow start, etc., in which case you can obtain the information from a friend who worked the same station later in the contest. Corrections must also be made if you finish several hours before the contest ends. The errors made on a large group of operators just about balance out, making their total reasonably close to the correct value.

As W1ZDP pointed out in the 1957 SS results (May 1958 QST), if you use some such system and have your hopes of winning a section certificate apparently dashed by receiving a high number, heed these words of caution: the guy might (1) have a kw. and be ineligible for the power multiplier, (2) be a multi-operator entry not competing for an award, (3) have more hours in than you, (4) be disqualified for rules violations or mail his log late or not submit one at all, or (5) be kidding by sending a number far above the correct one. Try not to be discouraged easily, but keep going. The turtle may not often win the race, but in this one you can surely do better than a fast-moving, prevaricating hare.

It should be expected that as time elapses the contacts-per-hour rate will drop. This is because you keep on hearing those previously worked and new stations become harder to find. Studies of a good many logs show that while the contact rate jumps around, it follows the typical smoothed pattern of Fig. 2. The solid line is for a 1000-QSO log and the dotted one for a 350-QSO entry. These assume that each op put in half-time (20 hours) the first week end. At the beginning of the
second week end new stations appear, and the rate is much higher than at the close of the previous period. However, it again drops with time to well below the previous low point for the last several hours. Studying these curves should suggest strategy for improving next year's score. It would be better to put in more than half the time in the first weekend, for example.

Most SSers—especially beginners—have no expectation of being section winners but would like to do better than the last time. Since this is primarily a matter of making more contacts in the same time, the best how'm-I-doing? yardstick is a chart of QSOs plotted against operating hours for the previous effort, on which this time's results are posted as they occur. Fig. 3 is such a measure drawn by the author for typical years over the past decade, this showing continuous improvement. Some of this is due to station equipment and layout changes, some to improvement in operator skill, some to the fact that there are more people to work each year. The ham population is growing and once anyone tries the SS he is bound to enjoy it and be on in the future. He's hooked!

One of the most frequently asked questions is "How long should I wait for a new section?" The answer depends on when you ask. At the beginning you shouldn't ordinarily wait at all because anything worked will be new. At the end you can't wait as your time has expired. Assume that you have tried reasonably hard to raise most of the sections for 38 hours, but still don't have them all. Your contact rate has followed the pattern of Fig. 2, so you can predict what your score will be for the remaining two hours if you don't get a new multiplier. Now assume you hear a new one and stand in line, eventually landing him. If the new number of contacts (one more) times the new multiplier (one more) is not equal to an unknown number of QSOs times the old multiplier, we can solve for the unknown to see how many contacts the new multiplier is worth. W1YYM discussed this in an article emphasizing that the calculation can be made at any point in the contest. This is true but not helpful (or significant), and the QSO rate is then higher than it will become later. The number of contacts so determined divided by the present contact rate gives the fraction of an hour which makes the two scores the same. Getting the multiplier faster shows a profit, a story shown in Fig. 4. The interesting result is that the additional section is worth one hour of your time regardless of how hot or cold an operator you may be, though there are fallacies to this line of reasoning. You might have gotten the multiplier later with no waiting and be better off. Also, if you need Vermont after 38 hours, all the Vermont boys may already have their time in and have quit by then. You should know which sections are rare and get them salted away earlier. Do the waiting when you hear them because it may not be possible later. Be on the bands where they are most likely to be found as a result of propagation conditions.

A week prior to the 1958 SS, I became concerned about the probable scarcity of KZ5s and worked three of them before one could be per-

---

snared to sked me at starting time. My beam could be rotated only after a trip to the back yard to walk it around with a rope, so it was aimed south when the SS began. After several fruitless calls to him, I settled down to work a few of the Florida and Georgia contestants, but decided the contact rate would be better if the beam was aimed west. A quick dash out back, a yank on the rope, a rush back to the shack, and there was a pile-up calling the K75! The second trip to the yard and the return of the beam south was much faster than the first, to say nothing of the return sprint to the rig—when he was calling me! I worked him and then ran out to put the beam west again.

Fortunately, not all multipliers come this hard. What is scarce in one part of the country may be plentiful in another. From my QTH (besides Canal Zone), it is always nice to raise Vermont, Idaho, Utah, Wyoming, West Indies, KL7, and V55. For me, any of these are worth waiting for whenever they are new.

The International DX Competition

This is an event in which W/K/VE/VO stations attempt to work as many DX countries on as many bands as possible for the multiplier, and on c.w. there is a limit (quota) to how many are workable on each band. This puts a premium on multiband operation, good antennas, propagation knowledge, and operating experience. The total operating period is 96 hours in two week ends with no time-outs. Ability to forgo sleep thus becomes a plus factor.

Universal DX Contest score-versus-contact curves centered on QST-published phone and c.w. scores were constructed in the same manner as those described for the Sweepstakes. The c.w. scores run higher for a given number of contacts for the same setup and conditions because the phone system prevents making many QSOs in any one country, while any number are permitted on phone. C.W. scores rise exponentially up to about 550 contacts and phone scores to about 700, after which they become essentially linear (multipliers become harder to come by!).

To illustrate how typical c.w. scores increase with time, several medium-to-high scorers' logs were examined and their scores calculated for each hour of the 96-hour contest. Each curve in Fig. 5 represents one of these operators. To avoid possible embarrassment, they are not identified by call. It will be seen that they all follow a pattern, even to the horizontal portions which indicate sleeping or other time-outs. (Let's hope none of them were for correcting TVI complaints!) The man who placed fourth in this group tried running straight through the first night and all the next day with essentially no time off. He was in third place for a while, and then hit the sack at 1 A.M. the second night for about nine hours, sleeping his way back to fourth place. The dotted lines for the third-place man are to facilitate following him through the crossovers. The first-place "iron man" did not appear to require any sleep! A point of interest to club statisticians is that most DX Contest scores (where the operator is on most of the time with the same setup and conditions) at the end of the first week end are about one-third of their final value.

In following the same procedure as used for the SS to determine how many contacts are worth a new multiplier, the curve of Fig. 6 is obtained. This varies slowly about a value of three for everyone; thus the better you are doing the less time you can afford to spend in pile-ups for a new one (but then if you are doing well you evidently don't have to wait long for most of them!). An hour wait for a new one is worthwhile if your final contact total is below 300, and this drops to a little over a half hour if your total is 900. The experts all agree that waiting does not pay. You should move on if you aren't getting to that station. Maybe propagation will favor you later on. In the meantime you can be scoring
elsewhere. Good judgment is required to decide whether multipliers can be obtained faster by joining the pile-ups, going after more contacts, or trying another band. Top scorers seldom stay on the same band for as long as an hour—they keep hopping between bands so as not to miss new multipliers that pop up, and profit by rapidly changing band conditions.

This contest is likely to be a disappointing experience to those in the U. S. and Canada not well equipped for such an affair. Those who run less than 150 watts input or who do not have beams for 14 Mc., and above may be able to work a lot of DX and get well up in the DXCC lists when a contest is not in progress, but they may find themselves “also run” during one. The competition for the rarer multipliers is terrific. Those with the best punch usually get there first unless they are lacking in operating skill, which most of them are not.

Field Day

This is an activity devoted to the demonstration of emergency preparedness, with an outdoor atmosphere and good contest techniques required to place high in the standings. Several different categories of participation are available. These include club or nonclub groups using various numbers of simultaneously operated stations, unit or individual portables, mobiles, and home stations. Multipliers are based on degree of independence of commercial power and on power input. Completely independent power and under 30 watts input are required to place well in the competitive classes. There are no operating multipliers, so the score is essentially proportional to the total contacts made. General operating procedure is the same as in the SS, except that the time period is 24 hours and there are no time-outs. The same station may be reworked on phone and c.w. on each band. The information sent is much less than in the SS and no sequential numbers are used.

The high score in each entry class throughout Field Day history is plotted in the solid line of Fig. 7, where Class C represents mobiles, Class B one portable rig with one or two operators, and Class A clubs and groups with the number of simultaneously-operated transmitters indicated. The dotted line of Fig. 7 breaks down the all-time high score made with ten transmitters. This shows the best scoring one, best two, best three, etc. of the group’s rigs, which beat all other groups in the three to nine transmitter classes.

Which class to enter? Except for numbers greater than ten, the six and seven transmitter classes seem to have been least exploited and appear to be the best bet for a well organized club having to be tops in its category. Class 1A is probably the most competitive of them all—Frankford Radio Club’s W3BES/3 set twin records of 816 QSOs and 7585 points there in 1957, rugged targets for future challengers. Some hotshots might be interested in bettering the all-time scores of K6EIT/6, 10,863 points in Class 2A in 1959 and W1FU/7, 12,006 points in 3A in 1959.

After the author’s two decades of Field Day experience in several classes, usually with improved results each time, and in order to reduce the effects of Murphy’s Law,3 the following are recommended: Stay in the 30-watt class with well engineered equipment free from key clicks, modulation splatter, and excessive harmonics. Employ a foot-switching i.r. arrangement. Obtain a reliable radio power source. Perform antenna design and fabrication well ahead of time, so only installation is required on FD. Use antennas suited for the job: horizontal dipoles on 1.8, 3.5, and 7 Mc, and horizontal beams on other bands. Have good operators who are familiar with the rigs, and get in some practice time before zero hour. Develop a foolproof logging and duplicate checking system and be sure all operators know how to use it. Arrange for physical comforts such as housing, lights, mosquito control, chairs, and good food.

When you have all those factors under control and, from past experience, plan to keep the contact rate above 25-per-hour throughout, then you will be hit by a terrific aurora storm and nothing you can do will maintain the expected average. This is like a horse race on a muddy track—there is still a winner even though no track records are made.

Despite every adversity, always keep plugging! In ham radio contests when the going gets rough, the winner will be the one who is best prepared and who gave his best all the way.

3 Occasionally quoted in QST as “If anything can possibly go wrong, it will.”

K6HCDY is a ham with the proper initials—C.W. and C.Q. His name is Charles W. Queenuel, Sr.

And speaking of odd modes of communication—K4LHB, a tuba player, reports that he QSO’d trumpet player W4DHO across a football field . . . while K4BWI and K3CHD hold nightly conversations by tapping on the radiators of a Penn State dormitory—to the indignation of other residents.
January 31 through February 15

Annual ARRL Novice Roundup Competition

NR = BFO. What, you've never seen this well-known formula in your physics book? This is the Novice Roundup formula, which substitution shows to mean: The Novice Roundup equals a Barrel of Fun Operating. Yes, sir, the Ninth Annual ARRL Novice Roundup Competition is about to step into the limelight for 1960. It's easy to enter — has few rules. The idea is for Novices to contact as many other Novices, and also Non-Novices, as possible, exchanging QSO number and section. Operating, listening, and logging time must not exceed 40 hours. How about having your station prove the Novice Roundup formula NR = BFO?

Scoring

To obtain the final score simply add the total number of your NR QSOs to the highest w.p.m. from your Code Proficiency certificate. Multiply this sum by the number of different ARRL sections (page 6) worked during the contest. A check of last year's scores shows that the possession of a CP award determined in some cases who was a section winner, as the scores came that close. So let a word to the wise be sufficient. Besides, what an excellent way to get that code speed up.

Novices should keep an eagle eye out just above and below the Novice frequencies (3700-3750 Kc.; 7150-7200 Kc.; 21,100-21,250 Kc.; 145-147 Mc.) for the higher power Generals who will be calling outside the Novice bands to help alleviate the sure-to-be QRM.

How To Participate

WV2BEX in the Western New York section hears KN5SPD in the South Texas section calling

Sample log form that must be used by all contestants.

| Station WV2BEX — Summary of Contacts Novice Roundup |
|-------------|-------------|-------------|-------------|-------------|-------------|
| Band | Time or Date | Date, Time of Contacts | My Hrs. Section | His Hrs. Band | His Call | His Section | Number of Contacts as Worked |
| 80 | 1801 | Jan. 31 | W. N. Y. | 1 | KN5SPD | S. Tex. | 1 |
| 80 | 1807 | 1807 | 1 | 2 | KN5LUD | Mich. | 3 |
| 40 | 1915 | 1850 | 3 | 2 | WIFIS | Conn. | 3 |
| 80 | 1890 | 1850 | 4 | 2 | WY2LJ | N. J. | 3 |
| 80 | 1860 | 1850 | 5 | 2 | KH4ZO | Ohio | 3 |
| 15 | 2020 | 2805 | 6 | 3 | K7NQ | Wash. | 6 |
| 15 | 2005 | 2805 | 7 | 3 | WTTW | Conn. | 3 |
| 15 | 1250 | 1250 | 8 | 3 | WZCIA | Ill. | 3 |
| 15 | 2522 | 1250 | 9 | 3 | WZCIA | Ill. | 3 |
| 15 | 2508 | 1250 | 10 | 3 | R5NPPV | Kan. | 3 |

Total operating time: 3 hours 18 min.
Hands used: 80, 40 and 15

Claimed score: 10 contacts plus 10 CP = 20 x 9 sections = 180

“Code Proficiency credit” multiplied by the “section multiplier.”

CQ NR. A correctly negotiated QSO would go something like this:

CQ NR CQ NR CQ NR DE KN5SPD
KN5SPD KN5SPD K
KN5SPD KN5SDP DE WV2BEX WV2BEX
WV2BEX AR
WV2BEX DE KN5SPD R HR NR 2 STEX
BK
KN5SPD DE WV2BEX R HR NR 6 WNY
BK
WV2BEX DE KN5SPD R TNX ES 73 SK
DE KN5SPD

That's all there is to it — another point and possibly another section added to your score.

Get that rig in tip-top shape, study the rules carefully, and drop a line to the ARRL Communications Department requesting the official log forms. Good luck and CU in NR. Prove, as many others have done, that NR = BFO!

Rules

1) Eligibility: The contest is open to all radio amateurs in the ARRL sections listed on page 6 of this QST.

2) Time: All contacts must be made during the contest, time indicated elsewhere in this announcement. Time may be divided as desired but must not exceed 40 hours total.

3) QSOs: Contacts must include certain information sent in the form as shown in the example. QSOs must take place on the 80, 40, 15- or 10-meter bands. Crossband contacts are not permitted. C.w. to phone, c.w. to c.w., phone to phone, phone to c.w., contacts are permitted. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your number and section and receipt of a number and section.

4) Scoring: Each exchange counts one point. Only one point may be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections used in this contest (p. 6 of this QST) worked during the contest is the "section multiplier." A fixed scoring credit may be earned by entrants who hold ARRL Code Proficiency certificates. If an entrant does not hold a CP award he can apply for credit by attaching to his Roundup report a copy of qualifying run from W6QEP, January 7 or February 3, or from W1AW, January 15 or February 15. CP credit equals the w.p.m. speed indicated on the latest certificate or sticker held by the entrant. The final score equals the "total points plus "Code Proficiency credit" multiplied by the "section multiplier."

(Continued on page 150)

January 1960
**Happenings of the Month**

**Report from Geneva**

**Election Results**

**Examination Schedule**

**GENEVA REPORT**

The one-month period just previous to our copy deadline for this issue (late November) has been a very quiet one at the Geneva radio conference so far as amateur radio allocations matters are concerned. Much of the time of the various working groups was spent dealing with specialized matters such as assignments to radio astronomy and for earth-space communications. Such problems were being solved without any adverse effect — at least, so far — on the amateur bands. Another delaying factor was the opening, on October 17, of the Plenipotentiary Conference — having no direct effect on amateur matters but sometimes competing with the radio conference for meeting room space and translating services — and for delegates' time in the cases of smaller countries.

Recommendations of lower-level working groups, in every single instance favorable to amateur bands as they exist in Region 11 (North and South America), began their progression through parent subcommittees and then to main Allocations Committee 4. The latter group, at our copy deadline, had worked its way up the spectrum as far as 4000 kc., meanwhile giving its approval to retention of the present arrangements for 1800-2000 and 3500-4000 kc, in this hemisphere. This and future Committee 4 decisions then must go to the plenary sessions for final adoption, and no action of the conference is final until it has received plenary approval — so it may be nearly middle December before anyone can know with certainty what the results of the conference will be. For example, one of the most serious threats to the amateur bands (and to other communications services as well) has yet to be settled finally by the conference — the possible expansion of international high-frequency broadcasting. We can say again, however, that if the final acts of the conference are the same as the recommendations of lower-level working groups, the amateur bands will be status quo in our portion of the world. This is no accident — the United States appears to be achieving the objectives which were carefully worked out in an extensive series of preparatory meetings held during the three years beginning in late 1956, and at which the League was the sole representative of the amateur radio service.

Assistant General Manager Huntoon returned to Hq. in middle November. General Manager Budlong is remaining in Geneva until the conference has made its final decisions — estimated to occur early in December.

**ELECTION RESULTS**

Balloting in the 1959 ARRL elections has resulted in the re-election of one director, “promotion” of two vice-directors to the top spot, re-election of one vice-director and election of two new vice-directors. Uncontested candidates for the remainder of the sixteen posts were previously declared elected, as reported in this department of the November issue.

Gilbert L. Crossley, W3YA/W3DKN, starts his fourth term as director of the Atlantic Division after defeating John W. Gore, W3PRL, by 3118 to 1043 votes. Thomas M. Moss, W4HYW, won a third term as vice-director of the Southeastern Division with 1088 votes to 733 votes for Arthur II. Benzke, W4PF.

In the Delta Division, an unusual situation developed; shortly after ballots were mailed to all Full Members of the division, one of the two candidates, William G. Davault, W5FQX, withdrew his name. Therefore, the Executive Committee declared Sanford B. DeHart, W4RRV, of Oak

Fifty-two amateurs, representing 15 government delegations, or otherwise participating in the international radio conference at Geneva, attended a dinner sponsored by the ARRL in late October. League president Dosland, W5TSN, acted as host, but there were few formalities and no speeches — just a pleasant evening of international fraternalism in the best amateur tradition. The facing diagram identifies individuals by calls, all that space permits.
Ridge, Tennessee, elected, as the only eligible candidate. “Doe” has just completed a term as vice-director of the Delta Division. He is a supervisor in the instrument and controls division at Oak Ridge National Laboratory. He serves as Section Emergency Coordination for Tennessee, and has put in two terms as president of Oak Ridge Radio Operators Club.

Winding up a term as vice-director, Dana E. Cartwright, W8UPB, moves up to the directorship of the Great Lakes Division, polling 2226 votes against 1087 for Ralph C. Charleenu, W8OLJ. “Carty” is plant engineer for the Stearns and Foster Company of Cincinnati. He has been radio consultant to the State of Ohio Civil Defense Communications Committee since 1951, and Ohio Section Emergency Coordinator since 1947. He also serves as trustee for Red Cross club stations W8YVL and W8YNV. A long-time ham, he built his first spark transmitter in 1912.

In the Atlantic Division vice-director contest, Edwin S. Van Deusen, W3ECP, won over Phil D. Boardman, W3LJEZ, 2116 votes to 1733 votes. Van has been an assistant director of the Atlantic Division for the past three years. He is a past president of the Mike and Key Club of Baltimore, the Yeadon (Pa.) Amateur Radio Club, the Washington Radio Club and the Foundation of Radio Amateur Clubs, Inc. He also served as chairman during the formation of the Foundation, and currently is its second vice president. Now retired from the U. S. Army with the rank of Colonel, Van takes an active part in MARS-Army, serving as state NCS and state director for Maryland and the District of Columbia. He is an Emergency Coordinator and Route Manager and holds an appointment as ORS and a membership in the A-1 Operators Club.

Canadian hams cast 982 ballots for Noel B. Eaton, VE3CJ, and 543 for William R. Savage, VE6EO, in the election for vice-director. Now retired, Noel ran his own business, The Eaton Knitting Company, Ltd., until a year ago. He is a past president of the Hamilton Amateur Radio Club, and has been president of the Ontario Amateur Radio Federation, Inc., for the past three years. Noel is perhaps better known to the DX fraternity as VY5BP in the Cayman Islands. A former Wing Commander in the telecommunications branch of RCAF, VE3CJ also is a member of AREC.

Robert B. Cooper, W8AQA, won the support of 2217 of the Great Lakes members to become vice-director of that division; Richard L. Alexander, W9TWO, had 1061 votes. Bob works for Consumers Power Company in Grand Rapids as a supervisor in the general meter and laboratory section. He is a director of the Kent Radio Club, and is a past president, past vice-president past secretary and past treasurer of the Grand Rapids Amateur Radio Association. Bob has served as an assistant director of the Great Lakes Division for ten years, and was Section Communications Manager of Michigan from 1949 to 1951. He holds PAM and ORS appointments.

The two-year term of office for these elected officials begins at noon on January 1, 1960.

EXAMINATION SCHEDULE

The Federal Communications Commission will give Extra and General Class amateur examinations during the first half of 1960 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. Even stated dates are tentative and should be verified with the Engineer as the date approaches.

No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque, N. M.: April 9 at 11:00 A.M.
Anchorage, Alaska: 53 U. S. Post office Bldg.: By appointment.
Atlanta, Georgia: 718 Atlanta National Bldg.: 50 Whitehall St., N.W.: Tuesday and Friday at 8:30 A.M.
Bakersfield, Calif.: Sometime in May.
Baltimore, Md.: 400 McCawley Bldg.: Monday and Friday, 8:30-10:00 A.M. and by appointment.
Bangor, Me.: May 11.
Baton Rouge, La.: 201 P. O. Bldg.: By appointment only.
Billings, Montana: Sometime in May.
Birmingham, Ala.: March 2, June 1.
Boise, Idaho: Sometime in April.
Boston, Mass.: 1639 Customhouse: Wednesday through Friday 9:00 A.M. to 10:00 A.M.
Buffalo, N. Y.: 328 P. O. Bldg.: 1st and 3rd Fridays.
Charleston, W. Va.: Sometime in March and June.
Chicago, Ill.: 826 S. Court House: Friday.
Cincinnati, Ohio: Sometime in February and May.
Cleveland, Ohio: Sometime in March and June.
Columbus, Ohio: Sometime in January and April.
Corpus Christi, Texas: March 3, June 2.
Dallas, Texas: 491 State General Life Insurance Bldg.: Tuesday.
Davenport, Iowa: Sometime in January and April.
Denver, Colo.: 531 New Customhouse: 1st and 2nd Thursdays, 8 A.M.

VENEZUELAN THIRD-PARTY TRAFFIC

As of December 12, add Venezuela to the growing list of South American countries where third-party traffic handling with U. S. amateurs is permissible. The bilateral agreement contains the usual broad restrictions limiting conversations or messages to purely personal and relatively unimportant matters — except, of course, in the event of emergency. The full list of countries where amateurs may freely handle such personal, unimportant traffic internationally is: Canada, Chile, Costa Rica, Cuba, Ecuador, Liberia, Mexico, Nicaragua, Panama, Peru and Venezuela.

Strays

Are there any students of Dr. Rhine in the house? WIZYD (5522 South Everett Ave., Chicago 37, Ill.) would like to hear from any hans interested in running radio-coordinated tests of extra-sensory perception (ESP). He believes that these will be the first tests of ESP conducted under such conditions.
RUSSIAN AMATEUR BAND CHANGES

Several frequency and power changes have gone into effect for Russian amateurs. Most of the changes, effective as of August 1, 1959, affect the beginning class of amateurs but several v.h.f. bands are now lost to all hams.

Beginning hams no longer have 1.715 — 1.8 Mc. Instead, they have been granted 7.0 — 7.1 Mc in the 40-meter band. The 80-meter band has likewise been extended from the former 3.5 — 3.6 Mc to 3.5 — 3.65 Mc.

Beginning hams have also lost the very popular 38 — 40-Mc band, but they have gained 28.0 — 29.7 Mc. The 430-Mc band has been extended from the former 432 — 435 Mc to include a full 15 Mc, 420 — 435 Mc.

Frequency tolerance must still be maintained at better than 0.1 per cent. Power limitations run a maximum of 200 watts with the various exceptions as stipulated. For example, in the 28 — 29.7 Mc band, beginning operating stations of the III category are allowed a maximum of 10 watts operating power. Stations of the II category are allowed 40 watts, and stations of the I category, 50 watts. Only 5 watts are permitted in the 144 — 146 Mc and 430 — 435 Mc bands.

Hams took a hand in Philippine elections recently. The Manila Times reported that radio stations were set up in 27 villages and two cities to pick up news and instructions and send returns to Police Headquarters.

W9ZOS made his first 6-meter QSO with K9EWW. One year later, to the day, he made his first Texas contact on 6. Guess who? Yep, K5EWW.
CONDUCTED BY EDWARD P. TILTON, * WIHDQ

In the more than thirty years that amateurs have used the frequencies in the v.h.f. range and higher our pioneering has resulted in a good many worthwhile contributions to wave-propagation knowledge. With the exception of moonbounce and ionospheric scatter, all known forms of long-distance v.h.f. propagation were discovered and first employed by amateurs.

Our usefulness in this way has done much to establish the basic worth of amateur radio, as a user of the radio spectrum operating in the public interest. Our record is a source of pride, but there are some who question whether we can long continue to add to it. With all the research now being conducted in ionospheric physics and the exploration of space, can the amateur continue to serve useful ends in the propagation field?

Perhaps the best answer lies in the considerable number of question marks still appearing in scientific literature devoted to the v.h.f. region. While there are still unexplained or only partially explained v.h.f. propagation phenomena, the alert amateur is still in a position to help. In support of this we cite the inclusion of two papers by amateurs, about amateur work, in the program of the 1965 Fall Meeting of the International Scientific Radio Union, held in San Diego in October. One by John Chambers, W6NLU, reported the work on 144 and 220 Mc. across the Pacific with KH6UK in detail. Their tropospheric DUX contacts have been without parallel in the world of science, thus far. The other, by Mason Southworth, W1VLH, covered data on trans-equatorial propagation, gathered by the ARRL Propagation Research Project. TEx propagation, discussed at length in December QST by ZE2JIV, is one of the outstanding amateur propagation discoveries of all time.

Elsewhere in this issue is a brief report on the v.h.f. work at KG1FN that may open up still another field for study: 50-Mc. propagation through the auroral zone. The possibility of this propagation has been suggested by far-north ionospheric soundings, and by studies of the aurora, but if actual v.h.f. communication by this medium has been mentioned previously it escaped notice of this propagation-minded reporter. Certainly 50-Mc. communication over distances of more than 2000 miles, at night, and in neither the F1 nor the sporadic-E seasons, fits into none of the accepted v.h.f. propagation pigeonholes.

The characteristics of the signals and the time of the contacts suggest a similarity to a kind of auroral propagation experienced occasionally on east-west paths in the north-eastern part of the country. At times (but during only a small percentage of aurora occurrences) strong and fairly steady signals are heard between New England and the Dakotas, Minnesota and Wisconsin. Usually the more common distorted signals are heard at the same time, but only from shorter distances, and on more northerly headings. As the east-west distance increases the speed of flutter and degree of distortion decreases, and the antenna heading for maximum signal more closely approaches the direct great-circle route.

The greatest distance reported for the mode we're talking about is New England to Winnipeg, Manitoba, about 1400 miles. This looks like a long sporadic-E hop, but the relatively few instances of it have always come during auroras, and at times of the year when sporadic-E propagation is quite rare. It has seemed to be associated with overhead aurora, or at least with auroras that extend considerably farther south than normal.

The work at KG1FN, and the similarity of the propagation to that we mention here suggest several new v.h.f. ideas. The short operating period at T3 produced contacts over only a limited geographical area, but alert operating by U.S. and Canadian 50-Mc. men might well stretch the potential coverage to a considerable degree. If more amateurs living or working in the far North can be interested in 50-Mc. DX tests, rather than in endless traffic with the home folks, there might be a lot more opportunities for v.h.f. DX than we have realized heretofore. For our part, it is quite possible that the 1400-mile limit we have ascribed to our 50-Mc. auroral DX might
only be evidence of the limit of activity at the western end. And though the phenomenon has been observed on 50 Mc., but not on 144, it should not be taken as firm evidence that it is not possible on the higher band, particularly as a weak-signal cw mode, with high power and large antenna arrays.

One thing is sure: we need, as much as ever, to take nothing for granted in our v.h.f. work. Letting our operating habits fall into patterns that fit preconceived notions of what is or is not possible can be disastrous. Surely a lot of us missed making contact with KG1FN because we were not looking in the right direction at the right time, or with sufficient care. How many other interesting possibilities have we missed, for the same laxity, all too common in today's v.h.f. picture?

SO-Mc. DX News

Conditions on 50 Mc. in November were a far cry from those of the same month of the past three years, but there was still life left in the band. Most of the DX heard or worked was in the lower latitudes. The North Atlantic path showed only occasional indications of high m.u.f., and no amateur 50-Mc. work with Europe had been reported as this summary was compiled late in the month. There were fairly frequent openings to South America, and occasional ones between the East and West Coasts, and between western states and Hawaii.

The first transcontinental contacts of the fall were made Nov. 1. WB6ML, Fresno, Cal., raised W4FT, Wilmington, N. C., at 0830 PST. Soon after, Florida stations broke through, and following them New Jersey, but it was all over by 0935.

W6FZA, Porterville, heard backscatter from the southwest, and tele-type signals from the Pacific between 1000 and 1100, Nov. 1. At about 1500 Alan heard weak signals above 51 Mc., indicating an opening to New Zealand. At 1530 ZL1HJ was worked on c.w., and each heard the other for about 20 minutes thereafter. Just a reminder: ZLs are confined to the portion of the band above 51 Mc.

A Nov. 1 opening to Hawaii was observed over quite an area. W4FT, Seattle, worked W5KV/KH6 at 1315 PST, K7AE and K7AE, Tucson, enjoyed 24 hours of work with the KHs, but heard no other DX on 51 in November until the opening to the East on the 17th. By comparison, last year they had been working VE1 almost daily for three weeks by mid-November, and had found the band open often to most of Eastern U. S., Hawaii, Alaska and Japan, at frequent intervals.

V.H.F. Sweepstakes, January 9-10

Everybody out for the big weekend event of the year on the v.h.f. man's calendar! It's the 15th V.H.F. Sweepstakes, Jan. 9 and 10. From all indications this should be the hottest contest in v.h.f. history. Get set for a week end of competitive thrills and valuable operating experience on your own, and for your local club. Rules in November QST, page 54. Reporting forms (they make it easier for you and us) are yours for the asking, from ARRL Headquarters.

If things have been relatively quiet in this country, our friends in South America have had enough activity to make up. LUSDCG writes that FF8AP, Dakar, French West Africa, was in almost daily for three weeks, after his first appearance Oct. 8, working LU, PY, CX and HG. Mike says that HR2DK and VP5FF brought his 6-meter country total to 29. For WAFNR's benefit, he has worked 21 different KP4's and is running for 23, in the hope of qualifying for the first KP4 certificate on 50 Mc. LUSDCG states that quite a few South Americans have QSL trouble on 6. One KH6 has confirmed no South American contacts. PY1XW has worked only one U. S. station on 6, and can get no card. These are just a few isolated examples. Mike claims LUS3EX lists 16 countries worked or heard on 6 during October in his PRP report. These include VP6PP, FF8AP, C1BSHE T18CV, 1K1GF, P91AE, ZP9AY, PJ2AN and many others. He says the band opens to Puerto Rico as early as 1430, and stays open regularly until after midnight. On Oct. 7 it was still open at 0400.

The ZE2JY-ZC4WR circuit also worked with clock-like regularity through October. Crossband contacts were made daily except on Oct. 9 and 12, and in the period Oct. 5-7, when ZE2JY was off the air due to fire in the shack. The 7F circuits between Australia and Japan were running solid in October, according to the PRP reports of VK3XK, VK8NG and others.

Hawaiian openings brought on a rash of claims for the first 50-50 WAS. At least three 40-staters added No. 50 on Oct. 25. From a check on contact times it now appears that the honor for the first goes to K6GDX, Fresno, whose

This 75-foot wooden tower was the work of K1AUD, Westport, Conn., and four other v.h.f. enthusiasts, all 17 years of age or under. Built in its entirety on the ground, it was raised with the help of a tow-car winch. Shown halfway up is one of the construction crew, K1DDQ. The proud owner, K1AUD, rests at the 5-foot square base. Antenna is a 5-element 6-meter beam. Total weight more than 1300 pounds.
QSO with K1OCDN was made at 11:20 PST, WSTM, Oregon, who made the first 40-meter 35-Mc. W, narrowly missed the 50-Mc. honor. His QSO with K1OCDN came 18 minutes after that of KG5XX, KG5NQ, Oakland, was even closer. Rob worked two K9Os, beginning at 11:30 PST.

Connecticut station K1BEC, New London, New York, and W1BH, Kingston, N.Y., worked each other at 12:25. The DX station CQ8 of the Dominican Republic worked each of the two stations on 15 meters.

K1K, New Haven, Conn., QSO'ed with K1QST, New York, N.Y., on 10.1 Mc., 13:10. No. 100 was wobbled at 13:25, then worked 1000 others.

K1DQ, 1460 Mc., worked KB9HY, 1300 Mc., at 13:05, then gave the first 1461 Mc. QSO to W3GWM, 13:15.

West Coast stations are still working each other, and the Pacific Ocean is filled with DXers making QSO's on all bands.

QST for

2-METER STANDINGS

Here is a listing of the standings on 2-Meter in the Eastern States, and results for the West Coast. However, keep in mind that DX bands, and DDS and DDSF contests, are far more pre-eminent in development now than 40-meter circuits are, so DX towers and high-powered stations are being built to overcome the signal losses.

Where does this leave the Pacific Northwest? Out in the cold, says W7L1N, Kirtland, Wash., and he shows typical weatherman's eyes for the season. It's cold now in the Northwest, the West Coast, and east, and everything will be just about like it was several years ago.

Northwest DXers have worked each other on 2 meters, however. But DX is the key, and while the DX will improve as the winter cereases, DXers in the Northwest are still working everybody east of the Rocky Mountains.

Attention amateurs north of the aurora belt: The Saskatchewan Amateur Radio Club, VESAA, has taken on an auroral research project with the University of Saskatchewan. They would like to find amateurs who can work on 50 Mc. in areas north of the auroral belt, in spots like Churchill, Uranium City, Great Slave Lake and Jasper, Alberta. More information from SARC, Box 801, Saskatoon, Saskatchewan, Canada. This is a project for high-powered, DX stations, and he begins by ordering a manufactured tower. The beautiful 75-foot structure shown in our pictures was the work of a 5-man team, the oldest member being 17 years of age. When Pacific Northwest DXers heard about the project, they quickly found out that the antenna is all important in developing good coverage in v.h.f. work. When summer time, date and town to W7CQV, 11140 Luther Ave. South, Seattle 88, Wash. The certificate is in the form of a decorated map of Western Washington, printed on parchment.

Attention amateurs north of the aurora belt: The Saskatchewan Amateur Radio Club, VESAA, has taken on an auroral research project with the University of Saskatchewan. They would like to find amateurs who can work on 50 Mc. in areas north of the aurora belt, in spots like Churchill, Uranium City, Great Slave Lake and Jasper, Alberta. More information from SARC, Box 801, Saskatoon, Saskatchewan, Canada. This is a project for high-powered, DX stations, and he begins by ordering a manufactured tower. The beautiful 75-foot structure shown in our pictures was the work of a 5-man team, the oldest member being 17 years of age. When Pacific Northwest DXers heard about the project, they quickly found out that the antenna is all important in developing good coverage in v.h.f. work. When summer
220 and Up

A nice silver-plated tank circuit for use with 2309 tubes, essentially convertible to 120-Mc. service, is available in the Navy M1R unit, now on surplus, according to W6NX, Los Angeles. The unit is sold at $10 to $20 dollars in the Los Angeles area, and the price is likely to stay low because the cost of the unit is of little value. These M1R units are also getting a play on 220. K6THC, Sunnyvale, sends us a list of twelve calls of stations running these units on 220 Mc. in the southern California Valley.

Good tropospheric propagation can be encountered at any season, but it develops less frequently in the winter months. There is enough occupancy of the 50- and 144-Mc. bands to ensure that conditions do not have too much effect on night-time interests, but on 220 and 430, occupancy is likely to drop off быстро, once band openings become less frequent. The best antidote for this is regular schedules, left religiously during the winter months. A good example is the nightly 220-mile workout between K2CBA, 220,005 Mc., and W3FYF, 220.14 Mc. They expect to continue through the winter, and they will work other stations at the conclusion of their 2130 schedule. Both are on the lookout for good conditions, particularly aurora.

Another schedule is being kept regularly over the rough path from Pittsburgh to near Washington, D.C., by W3KGE and W3CMG. This is just short of the W3FXF-K2CBA distance, apparently quite similar in character. W3KGE reports 40 contacts between Sept. 1 and Nov. 10. A B. had heard W1AZK, 480 miles, via aurora Oct. 4.

W3CMG, West Babylon, N.Y., is working on 432 Mc. the hard way. Harold mixes a 28-Mc., s.s.b. signal with 450,000 Mc., in a 804, the result being a 1-watt s.s.b., signed on 492. A high-Q coaxial tank is used on the output to remove spurious products. Results have been uniformly good, and contacts have been made at distances up to 40 miles.

W3KGE, Ridgewood, N.J., says that 232-Mc. operators in the New York area make it easy to find one another by the simple expedient of checking on the hour, between 2000 and 2300, when they have operating time available. Just one or two others, with normally a good signal, was fading into the noise, and peaking only on S4. Average signal level is lower than during the summer and early fall, but there are good nights, too; they merely come less frequently in the case.

The Sun Bernardo Microwave Society continues to do good work on bands that many hams have never even heard of. Weekly sheets on 3500 Mc. are kept at 2000 Sundays.

Laison is done on 146.25 Mc., when required, though contacts are usually made on the microwave equipment initially. K6M6L and W6YX1 are at the Pomona-Ontario end of the circuit, and W8BCT W6FBE and W8OYJ hold down the Coruna end.

The Corona-Ontario circuit shows strong signals, but K6M6L-W6EFE have terrain problems. W6EFE lives in a valley, with mountains on all sides, and for two years had been unable to hear any microwave signal at his home location. Recently he mounted his 30-inch parabola atop a 35-foot tower, and now he copies W6OYJ on 3335 Mc. This involves a 90-degree bounce off a ridge in the Santa Ana Mountains, south of Corona, but since there is no range of shadows, he is thus far able to reveal any object that might be causing the critical reflection. Distance between the stations is 16 miles, but the microwave path is about 9. W6EFE has also copied W6YX1, 16 miles away, over a direct path that includes at least one good-sized obstacle.

W6BCT and K6M6L, both in Pomona, had been unable to work via the microwaves because of obstructions, but encouraged by W6EFE's results they looked for reflection paths. They found three; one off Mt. Baldy, and two more from adjacent peaks.

In an effort to improve signal-to-noise ratio these microwave enthusiasts are working on stabilizing the transmitters, in order to use narrowband techniques, in place of the present L.f. systems which have wide-type bandwidth.

OES Notes

W1HDC, Canton, Conn.: — RIC video on 51.75 Mc., heard briefly around noon Nov. 21. Sound on 48.25 Mc., heard most days, but too weakly to indicate transatlantic 50-Mc. openings.

K2ZATZ, Baldwin, L.I., — HCNJW and H1CPE heard with 89 signals Nov. 1, 0930 to 0645 EST.

W3FFY, Lancaster, Pa.: — Nightly 220-Mc. skeds with K2CBA, Troy, New York, every Satur. night, down from 220 Mc., despite lower signal levels of late fall. Interference from TV oscillators and radio signals often makes going rough.

W4SH, Louisville, Ky., — Need more Kentucky activity on 6 and 2. Hear and work many out-of-state stations, but few in Kentucky, on Lone Star bands.

W8FRT, Benton Harbor, Mich., — Transm. Office Bulletin, on 220.16 Mc. at 2030 EST, Monday, Wednesday and Friday, then on Detroit. Would like 144-Mc. s.s.b. skeds with stations in South Carolina, South Texas and New Mexico, and 230-Mc. skeds with Wk.

W9OAB, Beloit, Wis., — Nightly skeds on 432 Mc., with W9031. Wheaton, Ill., show conditions paralleling those on 144 Mc., most of the time, though occasionally 432-Mc. signals are up when 144 is poor.

Have two parametric amplifiers working on 432 Mc., with noise figure of 1 db, using Hughes diodes.

January 1960

Page 69
Before plunging into a new year, and a new decade as well, let's pause for one look backward at the state of YL hamdom in the year which closed the fifth decade of the twentieth century.

The news is good; the picture is rosy. YL activity in 1959 seemed abundant, organized, and constructive.

Celebrating the twentieth anniversary of its birth date in 1939, the Young Ladies Radio League chalked up another successful year. Membership hit a new high — approximately 900 licensed YLs, including a growing number of DX YLs. Custodians for the WAS/YL, WAC/YL, DX/YL, and the YL Century Certificates were kept busy issuing awards and endorsements to eager certificate seekers, YL and OM. The club's revised constitution became effective Jan. 1, and among other changes it provided that those YL clubs with fifty per cent of their members belonging to the YLRL are eligible for national YLRL affiliation. Participation in the club's two annual contests, the Anniversary Party and the YL-OM contest, again broke records, and a new contest “Howdy Week” was tried for the first time.

Feminine statistics guessers could be grateful to the YLRL for conducting a survey and coming up with a reliable point of reference in the eternal question “how many licensed YLs are there?” Survey captains KB6US and W8OTK concluded that there were better than 4000 licensed YLs in the U.S., with an additional few hundred DX YLs.

The joys of single sideband operation were discovered by more YLs thanks to the crusading spirit of such “sidebanders in skirts” as K2MGE, K5BJU, W2TEX, W8SPU, K8IGG, W6NAZ, and Q05IE, to mention but a few. Interest warranted the start of a YL s.a.b. net on 20 meters conducted by K5BJU.

In the January 1959 column we noted that W2KEB, W3CUL, and W0LGG made the Brass Pounders League in each month in 1958 and that either W2KEB or W3CUL or both placed within the top three positions each month. The identical statement can again be applied to the records of the same three YL traffic handlers extraordinary for each month in 1959 as well. Slightly fabulous, is it not? Other 1959 BPL winners are W0KQD, W2RUF, W4RLG, K7BJU, and K6QWQ, most of whom have been BPL winners in previous years also. There's real public service through ham radio in the records of those persistent BPLers.

For the eighth year YLs assisted in the annual All Woman Transcontinental Air Race in July. Amateur radio chairman W3GTC deemed this year's net activities the most successful yet.

Get-togethers were numerous, with the YL meeting at the ARRL National Convention in Galveston, Texas, the most prominent. Those lucky enough to attend the Galveston affair appreciated the excellence of the YL program, arranged by members of the Gulf Area YL Amateur Radio Klub.

A busy year ended with plans already well under for a third international convention of the YLRL in 1960. Scheduled for June 17-19 at Boston, Mass., extensive publicity was pushed early with the hope of attracting the greatest number of YLs ever assembled at a ham convention.

Thus a busy year and a busy decade ended with a feeling of “good show” for the past and an optimistic “what's next?” for the future!
HOWDY WEEK RESULTS

A list of YLRL members who participated in the new "Howdy Week" contest in October conducted for the first time this year follows:

<table>
<thead>
<tr>
<th>Station</th>
<th>Score</th>
<th>Station</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>W6GCX</td>
<td>176</td>
<td>W1ZEN</td>
<td>55</td>
</tr>
<tr>
<td>KD8NQ</td>
<td>138</td>
<td>K12ZT</td>
<td>50</td>
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<tr>
<td>K4RNS</td>
<td>131</td>
<td>K6ZCR</td>
<td>38</td>
</tr>
<tr>
<td>K9QGR</td>
<td>106</td>
<td>K6QDD</td>
<td>34</td>
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<tr>
<td>K1JY</td>
<td>87</td>
<td>W8OTK</td>
<td>34</td>
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<tr>
<td>W8ATB</td>
<td>77</td>
<td>W8LGY</td>
<td>26</td>
</tr>
<tr>
<td>K9CTO</td>
<td>77</td>
<td>W7GQV</td>
<td>18</td>
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<td>76</td>
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<td>18</td>
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<tr>
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<td>65</td>
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<tr>
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<td>59</td>
<td>K6ANG</td>
<td>12</td>
</tr>
<tr>
<td>K6KCI</td>
<td>56</td>
<td>K8M1QG</td>
<td>7</td>
</tr>
<tr>
<td>W3TSC</td>
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<td>7</td>
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</table>

Eighty-nine non-YLRL members were contacted.

WRONE Certificate Rules

A further explanation of the rules for this new certificate offered by the Women Radio Operators of New England has been requested.

In order to qualify for the certificate an amateur must work six WRONE members after March 1, 1969, on any band, in three of the six New England states in any combination. After qualifying for the certificate if WRONE members are worked in all three of the other states not worked for the certificate originally, then a sticker will be issued. It is not necessary to qualify for a sticker at the time the certificate is initially issued, but when both the certificate and the sticker have been earned, the applicant will have worked nine WRONE members in all six N. E. states. Contacts should not be made during a WRONE net. QSL cards should be mailed to custodian Isabel Bunney, K1EAY, 47 Pine St., No. Billerica, Mass., accompanied by a self-addressed envelope with sufficient postage to cover their return and ten cents to cover cost of mailing the certificate.

COMING YL GET-TOGETHERS

Midwest YL Convention — The tenth annual will be held in Indianapolis, Ind. May 20-21, 1969. Pre-registration is $2.00. W9RTH is chairman; KD9XO, co-chairman.

YLRL International Convention — June 17-19, 1969, at the Hotel Commander near Boston, Mass. YLRL is hostess club. Co-chairmen are W1ZEN and W18VN.

Six months in the year Meg Hennon, K4HSC, hams from her log cabin high in the mountains in Hiawassee, Georgia. The remainder of the year finds her on the air from Coral Gables, Florida. Meg is currently Publicity Chairman for the Georgia Peaches Net.

This looks to us like the ultimate in rig installations in the kitchen. It’s hard to believe but this deluxe set-up is right in the midst of all of the accouterments usually found in the busiest room of any house. W4HLF has five harmonics too, so background QRN is a constant in Arlie’s operating. Hubub notwithstanding, she has made some enviable records in the nine years she has been licensed. A top scorer in several of the YL-OM and AP contests, the girl from Orange, Virginia is also foreign correspondent for the YLRL and in that capacity corresponds with over a hundred DX YLs each year.

German YL on single sideband is DL6VM, Ella Jacobs, of Munich. According to K2MGE, who supplied the photo, Ella has an impressive collection of certificates and awards to show for her on-the-air time.

As a KW6, K6QPG says that her popularity rating has never been so high. To better than 90% of her many contacts, Mary Garlow is the first KW6 and often the first YL worked. Mary and her OM KW6CQ have been on Wake Island for a year and will remain until March. On 10 and 15 phone and c.w. and 20 c.w. at all hours, Mary looks especially for stateside YLs.
How's DX?

CONDUCTED BY ROD NEWKIRK, W9BRD

How?

As 1950 sinks slowly into the west we set sail for the fair shores of 1959 in the good ship DX; and a promising year it is! Our file of accumulated information is abundant and ample for DXing in the coming years. It points out that there appears to be a tendency for a series of high maximum sunspot cycles to be followed by a series of cycles having lower maxima. It is not improbable, the article states, that the maximum of the next one or two cycles will be considerably lower than that of the present and recent cycles, and that it is possible that radio services may be faced with several decades of what, from a radio point of view, could be considered as virtually sunspot minimum conditions. The article concludes by advocating the laying of a cable to some part of the Commonwealth in the equatorial belt where the ionization is higher, and the building there of all main commercial transmitters. So unless you can emigrate, have sufficient room for a 7-Mc. beam, or know where to pick up several thousand miles of cheap surplus cable, you had better make good use of that 28-Mc. beam while the band is still open.

Several decades! Could this be possible? Unfortunately, yes; according to sunspot history it could occur. Our June 37 column touched upon the fact that sunspots, phenomena necessary for a healthy ionosphere, were totally absent from Old Sol’s feverish brow from the year 1670 to 1684, and the following thirty years produced a measly two dozen measles.

But cheer up, OMs. We can always dig those clever sinesong commercials on our faithful Conelrad monitors till a meteor trail shows up.

And then there’s the one about the unclaimed DX QSLs cluttering our ARRL Bureaus, and an idea revived by W4CQG of the W6YDK staff. Syd, a BPL type, figures that amateur traffic nets might well assist ARRL QSL Managers in buttonholing delinquent QSL claimants — although it’s definitely not the responsibility of a QSL Manager to plead cooperation from those he’s trying to serve.

Much of the bulk of a QM’s unclaimed backlog consists of cards destined for casual workers of DX, guys who catch a hot opening now and then and who aren’t aware that the Bureau is bothered by cards awaiting their self-addressed envelopes. Sooner or later they’ll wake up, perhaps, but meanwhile the Manager is burdened by a batch of aging QSO certifications that menace his sanity.

W4CQG’s QTC approach conceivably could help educate some of the unenlightened. One reminder per year per haggard ought to be sufficient, and any implementation of the scheme naturally would be up to individual QSL Managers and their traffic-bound acquaintances.

What:

After a respite in October, normally a month of poppy propagation, conditions bounded right back to boost out the old year in fairly solid style. Let’s grab a handful of “How’s” ticker tape fresh from the bounce to check recent fluctuations on our favorite stock, International Transmissions Preferred. . .

40 c.w., becoming quite a fakemor issue, sells at a brisk clip. “Low power and crystals can really compete on 40,” declares K3UBW. “DX, wings through from 4 p.m. to 4 a.m.” . . . “I’m writing this at three in the afternoon while a J1H2A and an LA2 boot beam are on the low side of 7 Mc, by 10th-meter beam is up to the 100-ke. level — I don’t remember ever hearing Europe before during daylight hours with the usual skywires.” — K2QXY . . . “Just heard all continents on 7 Mc, within five minutes — quite a thrill!” — 2JN . . . “DL1FF made his usual autumn breakthrough to the west coast to open our European season,” notes K6QY. — “Weak and hollow signals on 20 may mean good DX on 40,” agrees new 7-Mc. convert WSRX.

— K3VFY . . . WA3CQJ, W6NKE, KQCF, W7DUM, EL1A and a few others. Rugg and his pals down the road are working up CO8BH (7031 kc.), 17 hours QST, EA8CQ (9) 7-8, FAFIKJ (9) 8, GC3E, HOKFQ (9) 8, JA1s PTO C8C CGX CWZ CFZ CFZ LF NM WM WT, J3A AGH BP PG IQ, JA1s AEB AKT AMY ANI ANI ABD BLZ IZ J2HJ, J3A1C, J3As XCV, JS3s DF 80 100 JI 2D 30 JU 1N, JA3s BIN ATM AMT, K35QHJ (10) 8, W4CQG (7) 8, K3SW (10), LA6s 60 7X (9) 6, P7AN, T2CMF (9) 18, UAs in

NICE SENDING, JEEVES — NEAT BREAK-IN, TOO

72 QST
Last year's ARRL Pacific Division Convention at San Jose in July featured a striking display of QSL cards from more countries than most of us will ever hear. W6a AM BVM GPB KG LDD and TT chipped in 296 confirmations from 296 ARRL DXCC countries, all but four of which make up this appropriate backdrop for your first "How's" helping of a dandy new year. (Photo via Northern California DX Club, Inc.)

Number, VKs 3YD (5) 9, 5I5S 58, 7ZZ (6) 11 of QRP renown, VPI 6AG (3) 9, 9K0, VR20X (6) 7, X4I/KD (2) 18, X4K AI4630 2, XJZ 10 41F7, 3I1X (5) 4-5 and 4UP (12) 5... KN4PJW represents the 7-Mc. Novice contingent, reporting success with COC2WC and VK5H.

20 c.w. turns in its usual sturdy performance with WIDGT, K1s LIG (109/70 worked/confirmed), IAIP (65/38), JFF, KX6U, W3NRA, W2s JO1JOI/2, W3R, KJ4D, K2s QRP, W5KPP 6, W4s L5P, W6JU, W6WX Q00DF (40/27), GDQ, KJ3P7/8 (50), K4LA, K53SS, 11ER, VE1FQ and hi. Made accounting for APHam, GPB AM (134) 3, AR, API/5A, KAR 13C, KQ2T, COSH4, CPs CA CD CN, Cts 4AX (20), 7C5, GXX 5CO 750, CT2HO, DMs 2AG 5YF, D8XY, Eas 8BV (70) 23, 8Bm X6L, F flora, BF88E, FG7XT (53), FM7/7P, FO88B, FYTYG, GC2FAlV, GDS1B, HAs 6GI 58T, 8KCR 7FP, R8WH, HJ1U 3S6J, HJ4L, HJ1AW, HX2G, HX1A, IT4QA, JAl 1CF2/RC SAA 7AD 7TKH/mm (00) 12-19, 9A7, 9KI 7BB, KQ90G/KW6, Kgs 1Bx L6M 4A1 (36) 8, KVs2s 4A (30) 22 0 0, KX6B, LAs 4C/ 9S01/p SAD/p 9RG/73 (50) 16, LU6s IZA (35), ZL1 1ZL (65) of Argentine outposts, LAs 1Ex 1KBP 18, 2KZ, MP4s 3C9V (20) 2, 2XAJ (40) 129, TAF 1KNOID (20), 005s 4/4U (66), OXs 1G UD, PJM2E of mint Marion, PPA s AC AH, RASAI of Moscow. Sp's 3A7B 5AZD 8, NTS2R 16, SU1DS 8SW 4C, TES CAH DN EY RC, 12s 8XH 7A, 9AA 3AC 9AK 9HI 46C 9CM 9KCK 4, 9KDI (35) 5, 9K1N 9KWA 3AYA 9LX, 8BZ, 5DI3 5DN C, 8K5S 59S 89T, one ZA1AL, ZC4AM, ZD1AW 17, ZE1J 1IN 8S9 8JH 61V, ZPSs LA Ls 1, ZSs 36W ST 7K (33), ZA2B, 4X6s BA JO 27, 4X6s PA 20, ZA4s on a man's deeper freeces, 9G1CA, 8XK 16, 8M2s EV and FK.

20 phone is frisky enough to supply BV1s USG 7, USB 240 10, GNS 2BE 180, 8AR 145 5, 8CS 81G, Cpt's L28A 6, K5F 45Q 11, UVV 87 6, Z5E 2X7 93, ZW2 37, IUIs 14 JKZ, H6K3A (222), HRI MM 14, IT7 TAL K8QF, K8s 14A, 10M 12, L5A, L5C, (325) 2, OH1NO (318), 8X7ML* PJ2MC (145), TPP2GE (355) 5, UV11D 8, V76s 40, 8C5s CC 5, BA 8000 11, VPS1X VR20P (108), V5s Z7P* (305), 9AI* 10, YN9BM, YU1FF 14, ZC4BU 22, X4s GB (135), 2B 100, YAI7R 19 (88) and 9G1CB for the logs of W2, W6s AM BVM 7QI H (104), W1FO, KG0D, 8EL4A, HIKTLX, VE1FQ (1) on A3) and w.s.l. C. Morrow, nastierka for s.a.b.

10 c.w. moves 24-Mc. curious GM3BH to observe that the current 24-Mc. crowd's early emissions have encountered tratadelward. The bi-bottler boys on your eastern seaboard were quiet, and the middle west gang faint echoes in the distance. But able to the Four Pines region of Texas signals all the way to Mexico and Texas. Seemed odd to QSO those areas with no trouble from New York and New

January 1960
Y03GK slots holds his own on DX bands, particularly the c.w. slots, and sends this handy snapshot to W1VG.

...Ten is truly the wonder band, and all indications point to this band being really more and more opened up. Good power on 28 and 27.8 is well known. Toms DGT 5QD, K1ILG, KB3LD, WM3DI7/7, WQ4T, K0EJ II, WIUNP, K2QC, W9a LCG OGY, K9s ILWY KUR, K96FJ, EL4A, VE81P, and A. Stuck had no difficulty grabbing CE80 (38), CN28 (140), CJS 4x 5AR 6K 7TJ 10, C7DJL, DL8AA, EAs 8634 9AP, EL4A, FI4s 6xK, FORC, FORQ 180, K9DOP, IRAB, JAB 1, and ANP 16xK BZK BYL BLN BLR BTG BW4 CMD CN8, JAs 1xR 2xR 3xG 5JG 4tIB (50), K9K 7T 8DD 8X6T, KB2A, K9G6L, ZB4FM, ZEs 3xJ 1xS, ZL8s 16, Gx 4xKs DK GB (1980), JU, 5A2CT (310), 9G1QG and 9K2A.

15 Novice DXXers include W2oC ITZ IY, K1NFW, K0F6NEX and K0CQO, both from 160 c.w. and Q8V with 78GQ from 144 c.w. from Kenyon DXXer Gus 43DG.

160 c.w. transatlantic shows unity with W20GQ on 600 GWHT, W1B feel that this is more and more opened up. Toms DGT 28GQ, W20GQ is now in charge of 160 c.w. for BBO.

170 Amateurs are encouraged to join the ARRL and the League.
ing to tackle ZK1AU QSL chores beginning in March.

VE1UP tells W6KX that V66 suffixes CE and CI are unwork despite recent receipt of numerous QSL requests from Down Under. WTLFZ contributes to our IIkU-a-One-Thing-at-a-Time Department. A UPI dispatch dated November 13, 1959, reads: "All first-class mail addressed to military personnel and groups in Hawaii, the Philippines and Formosa which reached San Francisco on November 7th and 8th should be regarded as lost. Aircraft emergency alerting.

Asia — W8KDR reports he received a 487YL QSL for a 1957 QSO from manager KH6BPW who advises he has held regular skeds with some since 1956," reads a recent DX Bulletin of W8IDX. "Confimations dating back three years can be taken care of easily—s.a.s.e. or IRC, of course." VERON has it that deserved two-way standard confirmations for contacts with ZC4BE of Cyprus and Asia are available at Jack's mother's address which follows. The QTH appearing in October's "Where" may also be profitable. W9DYO and K2UYF forward lines from JT1AB: "Please send me all QSL cards direct to address followed. I have no QSL manager in France."

This appears October's first from K1LMSX no longer holds... W5GZV, assuming QSL duties for V2NSR of Hyderbad, writes: "I have an extract of his log covering contacts made during September and part of October, 1959, plus approximately fifty QSLs made out by Raju for previous contacts." Dutch desires the usual self-addressed stamped envelope from V97, but manager of HZ1AB formalities, invites, "Anyone who has worked HZ1AB since December, 1958, and has not received a QSL is urged to reply with another call or an s.a.s.e. or IRC for the man committee to take care of such things and it has been working out very nicely.

Africa — A review of the log data supplied by ZZ12M discloses a large number of QSLs unclaimed," communicates KE0EAB, John's QSL headquarters, Chris' ZZ29M log goes back to September, 1958, and Statesiders should supply s.a.s.e. and full QSL information with inquiries... Lucky lad's received on ZS0/E88/2 last month should use the address to follow. Lambert requests a QSL with self-addressed envelope plus one International Reply Coupon for surface reply, six IRCs for air. Non-IRC applications will go back via bureau... On-06 BK signs up with the vast W2CTN overseas bureau, the usual s.a.s.e. required...

Europe — SW7WT/Crete's new director of operations tells WUUED that QSL performance will improve henceforth. That ICO address for this station appeared to be no longer valid: see the list to follow... Just returned from Arizona to Letchworth," informs W7AMM (ex-DL20V-DL4V-W2LAF) W1LFF from W1FID. "I have 1400 grams, predating from February 2 through June 30, 1959. I'll QSL U. S. stations direct to Calbook addresses, otherwise stations will follow contacts in QST."

If not, [QTH if correct]. Arizona... I was surprised to find my DQ1JL3 trail included in September's column, particular considering I am bushed. Some of it could be on the ball! John, W9KAL, suggests a more expedient address in the following roster. "Be so good as to inform all QSLers that all 2500 QSLs have been mailed either direct or via the various bureau. Those still in need of 32AEVs verifications can obtain same by sending QSLs with s.a.s.e. to my home address."

This from W9SAI who says it's great to be back after covering some 34,000 miles in Europe and North Africa. - - - - - - W9HTL got back nothing more than a Radio Taxi w.r. filter in response to his card to "Z43U", and K8C7Z sent a bogus T9001 who uses the name "Paul" instead of the proper "Bill". - - - - KA4UXK, now signing D441CA at Birchfield, receives an occasional card for ex-DL1HIC. "A few of the cards are addressed to 'Doc' and all are dated in late 1956. If you can locate the operator who held that call for this period I will be happy to send him his cards. And some are rather rare..."

From one N. Milan, acting general secretary of Russia's Central Radio Club, to KZ5L as translated by K3CCU: "We acknowledge receipt of your letter in which you request a map or book of amateur radio call signs of the U.S.S.R. Unfortunately we are unable to fulfill your request at this time, since a call book now is in process of publication." Good by the way, those Russian QSL prefixes caused quite a furore on 28 MHz recently, their appearance coming as a result of a switch in the U.S.S.R.'s four-meter band allocation. No 'new ones' involved so far as DXCC is concerned. Calls like RA2KKA normally are used only on v.h.f. over there, so the flurry may be temporary, and a new situation such as seen even today, if you miss more than say, 20 per cent of Finland QSLs there must be something wrong in delivery.

South America — W9KSM will act as QSL manager for the Galapagos DXpedition of OA4 AM/ 3C-A 2/GM 5G and Dan himself, expected to lift the airways later this month. W9KRA indicates the usual QSL procedure is to have the Stateside applicants, IRCs for direct reply to others, and the remainder via bureau... H8KLX, who closed his H8F7LX career in late November, derives an apparent death of QSL spirit in Jamaica. "I have contacted twelve (12) VP6s there and have found it absolutely impossible to get one card despite use of s.a.s.e. IRCs and ready-made blanks. I have some 300 H8F7LX QSLs remaining and hope to hear all Buchanan confirmations by December 31st." Edmunroa also would appreciate help toward continuing contact with 3V8KKS two years ago... Movianer WP4D (W7TA) strives to keep abreast of the QSL situation in Tobago where minds turned toward radio drama, the cinema assignment should terminate at any time now, according to W7NL via W9KAR and W9FRC international QSL approaches noted by WA7PB: PABVF answers such QSL in the manner received, while S91Y sends reply immediately if air. Picric sufficient IRCs. via K6RFX from OH2YY: "I was SRAI QSL manager for over four years beginning in 1952, a time when a bare campaign was undertaken to improve QSLing situation such as seen even today, if you miss more than say, 20 per cent of Finland QSLs there must be something wrong in delivery.

Hereaboutos' Let's bring the WCTN superstructure directory up to date. Jack now handles QSL details for KE1DK, K6AS A-7, AGs 10, KE6S 1A at W9FRC/ WP5, HRPG, Z90s DA HA, KE6S CP CTU, Q6s RC I7, OXSRH, 6G8AL, TE3WD, VK6 2FR 9K6 9NT, VPB6, Z90s SG/gf, 9G8s 3CM 2FR 9K6 8NT, ZSTN, 901BQ and the non-W, portion of FMTWU's log. Once again we stress WCTN's need for s.a.s.e. from W KX6A, KE6S1P, VX6S, AGs 10, and Z90s DX activity. A. Ring of Quebec has about a dozen cards collected toward the "WCTN" certificate suggested by W6ISO in October's column beforehand, some of the filing is lengthy. The certificate is a good one for supplementary F&SA contacts between October, 1957, and November of '58 on 7 and 14 MHz... discloses W9SAI, "Sorry to disappoint but all 2500 QSLs have been mailed out to the various bureau. Those still in need of 32AEVs verifications can obtain same by sending QSLs with s.a.s.e. to my home address.

K9LTA, the Korean equivalent of W1AW, is headquarters station of KARL at Seoul. A fifty-watt range from 10 through 40 meters, mostly 20 phone, with operators (standing, left to right) Yim, Cho, Yos, Miss Imy (seated) John and Rhee. KARL Secretary Cho Dong-in expresses hope that soon there will be many more nationals holding ham licenses in the Land of Morning Calm.
yet to hear from the fellow ....... Interesting episode at KZ5LC. "Worked VP2KJ of Nevis who said 'QSL via my QSL manager, WMX5S.' After signing I went right to work on a card, listening to QRM UU telling some U.S. hams about the forthcoming OvQ DXpedition to the Galapagos. I broke in, offering any KZ5-type assistance needed. Who was the Stateside ham? WMX5S! Perhaps I'm the only DXer who has saved postage by QSOing a QSL manager within twenty minutes after making his claim. ....... W8AOI tells KD4V it knows nothing about any 91 bearing his suffix ....... K8SAJ offers his good offices for the handling of a deserving rare DX station's QSL difficulties ....... KCCF compliments the W8/K6 ARRL Bureau on an efficient job, and W9/K9 Manager W8DOSO scheduled a well-earned Mexico vacation for about this time ....... Specifically seconding, now, and in detail:

C83LY, J. Farrance (K8KHT), Casilla 13120, Santiago, Chile
C2N2K (via W2CTN)
ex-CN8ES, P. Pagnoux, LF4A06, Varennes-sur-Ailleron (Allier), France
DL4UN, G. Zobel, P.O. Box 895, Ulm/Donau, W. Germany
DL4HCA, J. Hallowell (K4UUX), Maiwiese E-17, Birkenfeld, Germany
DB3L, J. Elcinstein, W0KAL, 1418 E. 57th St., Chicago 37, Ill. (or via DARQ)
KD4U, T. O'Connor, 250 Collins Ave., Whitehall, Dublin, Oregon
EL2Z, P.O. Box 270, Monrovia, Liberia
EL3M, Mary Knowles, Letournament-Liberty, Roberts Field, Liberia
ET2BP, B. Pernet, USA MESC, APO 846, New York, N.Y.
F7GB, U.S. Army Signal Svc., APO 58, New York, N.Y.
F7GCL (via W3ZGD)
ex-F8BAG, Y. Ramain, ave du General Leclerc, Boussemart-sur-Seine (Seine), France
ex-F8BBX, E. Chabon, Chalet Udako, Ilbarritz-Bidart (Basses-Pyrenees), France
ex-F8BBZ, Y. Millesi, 18 Belle Vue, rue Felix-Pyat, Bt 98, Marseille (Bouches-du-Rhone), France
FORAC (via WJ4WC)
FORAX (via W4DEII)
FORMAC (via W8H3I)
FPB9E (via KJ4LY)
FP83H BI (via W1PFA)
FORAT, P.O. Box 13, Ati Chad, Fr. Eq. Africa
F0B3HI, C. Rinaldi, B.P. 137, Brazzaville, Fr. Eq. Africa
F0WAS (via W5ING)
FV7YA, (via W8D1X)
H12GR (via RC3I)
H13LX, E. Quinones P., Carreras 27 No. 70-89, Bogota, Colombia
H16GC (via LCRA)
ex-H1K7LX (via K1K3LX)
HIPGF (via K1AQ)
HR2FG (via W2CTN)
HDBE (via W8AMM — see text preceding)
J40BB, T. Tsuchida, Sezaki-Mura-Katoma, Matsukawa, Nagano, Japan
JTTAB, B. Kubne, P.O. Box 369, Ulan Bator, Mongolia
JZ0A, P.O. Box 130, Sorong, Netherlands New Guinea (or via W2CTN)

ex-K2DAY-JGY-JG-

Capt. E. Worrell, Jr.
W3MID/7, Box 419, Officers Mail Rm., Hill AFB, Utah
K2ALM, Nave RadFae, Navy 860, Box 17, EFO, San Francisco, Calif.
K1GBX, APO 23, New York, N.Y.
K1BBH, French Frigate Shoals USC0 Loran Stn., P.O. Box 416, Honolulu, Hawaii
M4BCY (via MP4BWH)
MPTAF (via RSGB)
OA30, Box 91, Lima, Peru
ON4R, A. Lancy, 511 rue Boqueneaud, Frapport, Liege, Belgium
OF3AA, P. Monetrier, P.O. Box 55, Bumba, Belgian Congo
OOSM, E. S. Bolton, P.O. Box 27, Luquina, Belgian Congo
PI2KBE (via K92SW)
PIUL, J. G. Reifst., Shobra, Cairo, Egypt
SV0WS (via W8YNF)
SV0WT, Crete (W/K/VE/VOS via ARRL, others via ISW)
T4ADW, MARS, APO 81, New York, N.Y.
TG4CL, P.O. Box 468, Guatemala City, Guatemala
VE2AIG/SU, J. Simard, 59th Canadian Sig. Sqdn., U.N. Emergency Force, Post Office, Beirut, Lebanon
VESTO, c/o ISWL, 89 Burrenger Rd., London N. 10, England
VP3XG, P.O. Box 331, Georgetown, British Guiana
VP4MM, J. MacDonald, P.O. Box 800, Port of Spain, Trinidad
VP8DO, P.O. Box 207, Port Stanley, Falkland Islands
VP9RU, M. Lambert, P.O. Box 301, Hamilton, Bermuda
VQ1SSB, WVR (via VQ5G)
VQ2ES (via ZE1FSB)
VQ8AO, c/o 151 Park Rd., W. Hardiepool, Co. Durham, England
VR3X (via RSGB)
VY3DO (via MARTS)
VS1EA, Sir. N. James, Sats. Mesa, RAF Changi, Singapore 17
V84T (via K03MA)
V86AZ (via K03MA)
VUZAN (via W6PQO)
VU2NR (via W982Z)
W8FPL/K4P, G. C. Isely, Jr., CSM0-2, Navy 1500, FPO, New York, N.Y.
WA8DM1/mm, C. E. Powell, Bella Kaze, c/o American Consulate, Saigon, Vietnam
VJ3YJ, P.O. Box 79, Ploesti, Romania
VY1YW, V. Weicht, P.O. Box 517, San Salvador, El Salvador
V3B3B, F. Kierjian, Gregoriee 7, Pirm, Yugoslavia
V8A4JX, Box 3974, Caracas, Venezuela
Z51AL, Box 57, Tirana, Albania
Z52RG (via G8RJX)
Z5CBE, c/o Mrs. Swany, 35300 Maud Rd., Woodside, London S.E. 25, England
Z52AF (via W8GQ or G8LQP)
Z5DZUP (via RSGB)
Z5D8M (via K9EAB)
Z7EH ZD6, P.O. Box 941, Salisbury, So. Rhodesia
Z8J (via W8YXO)
Z4ASE, CD1M LTS, Oranjemund, South West Africa
Z34J, P.O. Box 93, Windbeek, South West Africa

H21AB is a venerable DX institution over Saudi Arabia way and we've been favored with several pictures of the station's embarrassment and gear over the years. This is the Dhahran Airfield Amateur Radio Club, an outfit whose 325-1, BC-610, 75A-4 and three-curtain rhombics now pepper the world with plenty of juicy QSOs. In the group are (rear, left to right) K1DWG, J. Davis, W4ERQ, K5MAI, M. Carpenter, K3UO and K9PBV; (front) K8LII, W8JNL and K0LYM. Messrs. Davis and Carpenter should have their Condylions by the time this QST gets around.
Alexander conquered the world while still in his twenties, but K8JXK turned the trick before he was 12. If there has ever been a younger ARRL DX Century Clubber we have yet to hear of him. (Photo via W1WPO)

January 1960
The wanderlust, an extremely virulent strain of DX fever, lurks in almost everyone, but few of us can heed its siren call. WA6DMC could, however, and was inspired by the USAF in Japan after 23 years service, Carl acquired the Bella Kaze and put to sea with his wife Masumi (in photo), Japanese crewman Fujie Nobuo and Butch, a German shepherd, for a leisurely voyage around the world. Since November, 1958, this trim craft and its doughty crew have island-hopped the China Sea and now head for Vietnam after a pleasant stopover with the VS6 gang. WA6DMC/mm frequently is heard on 21-Mc. schedules around 0900 GMT using Heathkit Cheyenne and Comanche mobile gear.

SUIMS regularly shakes up North Americans with 80 watts and a 100-foot high dipole near 14,080 kc. Mahmud likes c.w. sessions around 0200-0400 GMT. (Photo via K2UYG)

vichinity, checking up on the U.S. auto industry, Mac reports that JAEJ/mm, a 3-Ale, fixture of long standing, is fairly inactive now because of heavy winter skies. Africa Mora broke course recently to answer an SOS in a Midway area storm, arising N of the sun and only glass fish net floats afloat. YAI1W (K9WJG) writes somewhat sorrowfully concerning the intended Andaman action of V2US AK NR, and N1BU has V2USL. Port Blair. Out on the air one day as V2USNR was finishing a QSO with W3RIS and heard him tell Walt that I was not going on the forthcoming DXpedition to the Andamans and Andamans. A few minutes later I contacted Raju and he confirmed the disappointing news. I had previously applied to the Indian government for a licence to operate in V24 and V78. Not long afterward I received an official reply in the negative. In the meantime preparations were made by V2US AK NR, WP3B5 ROO and WP7BO (Word, ROO and many other hams throughout the world. Since the Indian government will not permit me to go even as a second operator, that eliminates V78 because I was to overcome lack of Lacedeivics powerful facilities with an Onan generator. ACS and ACS earlier had proved impractical goals because of civil matters there. Anyway, the way things now stand the three V2s are going ahead with the part of the trip that includes the Andamans. They hope to operate 15, 16 and 17 meters, c.w. and a.m. and wish to be heard on 20 meters, c.w. and a.m. from Afghanistan with a G-65, G-77 and, for the most part, a simple dipole. Now he's out to see some of the many friends he made on the air, touring Asia and Europe by Landrover. KAI1DN, formerly LI22AM and KARL's first honorary member, is desirous to see the Indian radio making further progress in Korea. VERON writes that DJUJP has his DX eye on a middle-drain Turkey spot if the scarlet ribbons give way. WIA’s VE2ZKR writes of BY8's IAC and 4AC, presumably Red China, heard in QSOs with Curtain folk on 20 c.w. around 1200 GMT.

Africa — Looks as though the Alabins will hold out a while longer, judging from VQ1AQ’s entente to W3CTN (and did you see the recent National Geographic treatment on VQ7J). "The chap who has the boat we were to use on our (Continued on page 160)
KLAXON REBUTTAL

Route 10
Livingston, N. J.

Editor, QST:

Several months ago your columns carried several letters claiming the first use of klaxon horns at conventions. In the process of ruminating through my old records recently, I ran across a clipping from the now defunct "New York Globe" dated March 13, 1922.

In addition to establishing a "first" date in the subject area, I think many of your readers will be interested in the newspaper reporter's account of the good old days when short wave transatlantic communication was still an unaccomplished dream.

By way of explanation, a half-inch spark coil was used to drive the Magnavox speaker. We expected the Magnavox to develop shorted tones at any minute with this high voltage input, but it held up nobly.

The "we" is not editorial; while I spark-plugged this venture, I was assisted by John Dodman 2AG and John Tiffany 2BQK. The newspaper account of the affair follows:

RADIO BANQUET SCENE OF
WILD ENTHUSIASM

One of the greatest gatherings in the history of any radio took place last Saturday night when the annual banquet of the Second District Council was held at the Hotel Pennsylvania.

Among the speakers were Professor Alfred C. Godsmith, David N. Saroff of the Radio Corporation, and Lieutenant Commander Patterson, J. O. Smith was the toastmaster. The climax of the evening came in the form of a testimonial to Paul Godley for his successful conduct of the trans-Atlantic tests last December.

During the early stages of the dinner the immense lamped ball was a buzz of sound, owing to the fact that most of those present had brought some sort of whistle or other device for making a noise of some sort. The first few amateurs in the ball started the ball rolling by using these whistles to send code messages back and forth across the hall. As more amateurs came into the room the noise was added to and the dots and dashes flew thick and fast until such a state of interference was caused that no one could read a single message. One of the amateurs who sat in the balcony came all prepared with a Magnavox, storage battery and key. When the key was pressed the Magnavox "spoke" in a way that could not be misunderstood. This young man just about controlled the whole meeting with a few terse remarks at the right moment. His F B and H 1 and other abbreviations were certainly appreciated by the other amateurs present.

Dana A. Griswold, WSOAB

HAWAI'I DX

606-7 Lilienthal Rd., APO 915
San Francisco, Cal.

Editor, QST:

I have been a ham for only about three years. During these three years I have enjoyed FCC, WAS, WAC and a pretty good plug at DXCC. While enjoying my hobby, I also felt it was my duty to participate in the 5 meter traffic nets on both c.w. and d.c. I have never received a message or help in my few years.

Now I have been shipped to Hawaii and feel that this is probably my first and only good chance to receive a DXCC award. At the same time I realize that now that there are 50 states, my QSL is in great demand as the 50th state in most cases. I feel that it is my duty to help these people out and think nothing of filling out five or six log pages a week just for the DXCC hunters. When the weekend comes around I see at least one chance to go after my DXCC award. I sometimes call "CQ DX" which by common usage means "CQ foreign country." At the end of my first DX I have no less than 30 stations on the West Coast calling me. Before long I am deluged by half of the people on the band, so I cannot copy the weak DX calling. I then call QRZ DX, NO USA. This plea has no effect whatever in most cases. If the band does not yield any DX, I am always glad to work my buddies back on the mainland the rest of the day. I always appreciate the fellow who hears my CQ DX and moves up about 5 kc, to give me a call. This enables me to search for any legitimate calls. If I don't hear any I will gladly answer the good operators off the freq.

Warren A. Weil, KIIDDGJ/WSKKW

ADD SERVICEMEN

317 N. 9th St.
Montevideo, Minn.

Editor, QST:

Thanks for the article "Power Line Noise" by Richard Smith, WIFTX, in your November issue. He states that cooperation by amateurs is necessary — I would like to include radio and TV service men also.

I have been employed by a power company for the past 32 years. Part of my work is radio and TVI detection. We use the methods he mentions and have done so for years.

"Take issue with the following statement he makes: "Conversation with other power company engineers indicates that not many of them are familiar with this type of noise either, which is surprising but true." I cannot agree with this. The power companies have construction standards written up from years of experience, which specify just what must be done to eliminate line troubles. We find that just a small percentage of complaints are due to lines. Many complaints are received and when investigated are found to be due to other causes. Some amateurs are prone to call all their interference "line trouble."

It is surprising some of the calls we get. For example, a person complains that the trouble is caused by his neighbor and would do something about it. They request that we do not mention where the information came from. What would you do in a case like that?

I was at an interesting TVI demonstration some years ago. The chairman was an amateur. He called for questions from the floor after the meeting. A party got up and asked what the power companies did about this line. He answered in not too friendly a tone, that they did nothing. I got up and expressed my opinions and that I didn't like the statement made. He could have learned something about cooperation from an article such as Mr. Smith's. Believe me, the electric utilities get blamed for a lot of interference that they are not responsible for. Cooperation from them making the complaints would be appreciated.

I would like to see articles by amateurs in QST and other radio magazines on radio and TVI experiences they have had. There are, no doubt, quite a few "Hams" working for power companies with experiences that would be helpful to the rest of the amateurs.

In the words expressed by Mr. Smith, "Don't get tough" — let's cooperate.

C. A. Standman, W6GBP

STRUGGLE WITHOUT NOVICES

P. O. Box 64
Croton Falls, N. Y.

Editor, QST:

We have all heard the sermons about how crowded our (Continued on page 16B)
1960. Let’s face it; a New Year is ahead. This is written before all 1959 work has been reported, but we dare say that the old year is going to show more awards and certifications granted, and a larger volume of traffic reports and emergency tests reported than in earlier recorded ARRL history. We hope you enjoyed some part in this; also, that as an amateur and League member you hold an SCM Official Station post or leadership role or will hold them and share some of our results and rewards in the ever-rewarding hobby of Amateur Radio in 1960.

An ARRL aim is to provide objectives such as appointments, award recognitions and mechanisms to make our communications skills honestly useful to ourselves and others. Special activities help make a greater sum total of radio results for those who take part, and can be a stepping stone to individual increases in proficiency. Overall, our radio operational results are the sum of each station’s activity, and the organization efforts of each member and field organization leader. The substantial progress of our National Traffic system and ARRL Emergency Corps is the result of these organized efforts.

Things to Go After. As you sum up your individual radio records of the past year, large or small, let these just be a stepping off point for getting the most out of amateur operating in the coming months. Watch the Activities Calendar which appears in this section of QST. Each month it will show the operating activities. Besides the four major contests, VHF SS, DX Contest, SS, and Field Day, there are code runs for certificates, FMTs for higher precision frequency measuring, CD parties for fraternalism and station testing etc. But you the member have to select some items and apply yourself, or it’s no show. You profit in this game only in proportion to your participation. We suggest making use of these ARRL sponsored activities in 1960 to become a more versatile amateur. Recognition, appointments, and operating results come only as one bests himself. How you do it is evaluated by you. Keep in mind, however, a certificate or QSL card can turn sour instead of standing for a proud result, if not earned or achieved with courtesy, and decency in operating, conforming to the individual and group rules and standards of the fraternity.

Some simple questions get us quickly from the general to the specific. Do you have WAS or DXCC? CP-35? RCC? QSLs, memories, and operating know-how from your time in the DX Test, VHF-SS, SS, or FD? OMU, AREC cards, RACES identification? Use phone, c.w., RTTY? Net membership? H.f. . . . v.h.f.? BPL? OES, OPS or ORS? This, we think, is the year to decide to go after some of the new things, that you haven’t achieved in the past, as well as to extend past records. Nineteen-sixty is a good year to go for some new angles in Amateur Radio.

V.H.F. SS. Did you have a good time in the November Sweepstakes? Here’s another one, but this one exclusively for v.h.f. The dates are Jan. 9-10 and besides giving your v.h.f. gear a thorough workout, it’s a chance to get new States and ARRL sections on bands 50 Mc. up. Novices and Technicians now use both six and two, and according to advance reports this will be the biggest V.H.F. Sweepstakes ever. You can depend on there being v.h.f. activity going on simultaneously in every part of the nation. ARRL extends the cordial invitation for you to take part. Your reports on what you work in the period of the V.H.F. SS, large or small, are welcomed. See the detailed announcement in December QST.

ARRL’s International DX Test. February and March will mark the dates for the annual DX fray. We always run the announcement well in advance, so it has time to reach all overseas points beforehand. As usual, we have airmailed data to key spots, and invited other nation’s societies to invite their members to take part. It should be a good test. Four separate week ends are provided to level out the QRM and to get insurance against propagation conditions being bad for a given week end. We’ll hope for the best conditions for our phone and c.w. week ends. If time permits and you have a “full gallon,” you will of course be out to win; but the chief patrons of DX contests are always those looking for more DX and some new countries that may only show at this time of year. Good hunting!

Alaska and Hawaii Make New States for DX to Look For. Last year’s DX contest rules were printed before we knew whether or not Alaska would make statehood by the DX test dates, so no change was then made. This year for the first time the DX competition rules place both Alaska and Hawaii on the same side as the other 48 states — looking for DX countries. During the year we made a survey of all DX participants in the two new states, and while some
were strong for keeping K17 and K18 in a countries status for the contest as well as for DXCC, the majority favored the contest change we now make official. (There’s no change in status for these areas to count as DXCC countries in view of their geographical separation, of course.) In the contest all amateurs outside the United States and Canada will now have a better chance to accumulate credits for WAS. And we hope DXers in both new states will have a holiday working on a “new side” in the contest.

December-January Prospects for 1.8 Mc. Work Good. “For some years back, special tests have taken place on the 160 meter band, especially with the G’s. W1BB has worked some 55 counties on this band. I, myself, worked W, VE, FA, and other DX when I was G8WY.

Many G’s do not use more than 10-watts, but some G’s have worked ZL’s on this band, ultimate DX for 160. Working to get across at this season is a fascinating past time. I recall contacting a 6-watt W1 some years back.

“Now that the sun spot cycle is swinging back to the Li. bands, I hope some organized activity can be arranged. This is a plea to bring fellows from the higher frequency bands down to 1.8 Mc. to try and see what can be done in North America. These winter evenings will bring real good e.w. DX, if only the fellows will come on and give the band a real work out. Let’s have a real burst of activity on 160 meters this winter.”

—H. A. M. Whyte, VE3BWY ex-G8WY.

—F. E. H.

Amateurs in Camden, S. C., were ready for “Graecie” long before her actual arrival. As early as 1100, Sept. 28, they were set up at C9ty Hall with three stations reporting in from the north, east and west outlying areas. Operators at this station remained on duty long after the emergency was over, assisting with messages and to other stricken areas. Those mentioned: K4s YVE YOE OGP ULP ZUE STM KEC, W4DBH, KN4s JYF JFX JPT KAL. —W4DX.

On October 1st approximately 6500 a tremendous gasoline explosion at a refinery just north of Charleston, S. C. created an emergency situation that required amateur communications facilities to go into action. W4ZRH requested broadcast stations to send out an appeal to all amateurs with mobile equipment to arrange to be at a point near the fire. By 1030, communications were established between the Emergency Red Cross location and Charleston Air Force Base MARS station, rendezvous point for mobiles, and police control points near the scene of the disaster. Subsequently c.d. and local amateur v.h.f. equipment was placed into operation between the police control point, Charleston Air Force Base MARS station and the Red Cross control center. This v.h.f. circuit was very effective for local traffic. The following amateurs took part in this emergency: W4s EK3 CSP ADZ HUT IVE OOH TPE ZRH ZJU VPN DAW, K4s SPQ RJZ CNZ CNQ USA. The group was congratulated publicly by many important officials for their fine work. —W4ZRH, State Radio Office, S. C.

Amateurs in Western Florida assisted the Okaloosa County sheriff’s office in patrolling streets and highways and reporting damage during tropical storm “Irene” on October 7 and 8. A portable ten-meter station was set up in the sheriff’s office in Fort Walton Beach. Other stations, previously installed for just such an occasion, were activated at Port Walton police department and at the Eglin Air Force Base Hurricane Command Post. Mobile units, accompanied by uniformed members of the sheriff’s posse, patrolled all highways in south Okaloosa County, reporting

VEUS, EC for Nova Scotia’s south shore, operates his mobile rig during Liverpool’s Bi-Centennial of Civil Defence, a c.d. exercise held in September.

(Photography by Bob Brooks, Yarmouth, N. S.)

January 1960
stalled cars, power lines down, road and weather conditions. The net was in operation from 1800 Oct. 7 to 0500 Oct. 8. Several local stations also maintained contact with long haul nets on 75 and 40 meters. The following amateurs participated: W4EJ BWK KK6 QP, WPJ BFY MFY EMM UXW AOK BLO BVE NFLS, K4S MDJ PHL UPY AAK J5J MTQ UBQ L 01, OSY, W3S WOQ/P BSE/A, K4S A0Q/4 CSS/A, W0FBZ/4, W7NFG/4, W4KHL, SCM Western Fla.

On Oct. 10, electrical storms and heavy rains left the city of Columbus, Ohio, without any communications except radio. Members of the Tombigbee Amateur Radio Club, along with supporting stations in Mississippi and Alabama, assisted in maintaining communications until regular service was restored. Participating: K4S PH6/mobile, TDI, DQ7 HCA, K4S LIH MHR EPA, W3S BEY JAR BIH. — W4JGJ.

W5ODK/mobile witnessed a serious auto accident near Tulsa, Okla., on October 10. Immediate contact was made with W50FQ in Tulsa, who summoned police and ambulance aid, KLM6/mobile, near the accident site also by directing the ambulance to the accident location. — W5ODK.

The Virginia Phone Net (VFN) mobilized its forces into action on October 30 when communications were needed in connection with rescue operations for a crashed air liner. K4CHA situated himself in the middle of the search area and acted as main liaison link with the rescue team. Also K4CHA on six meters, who then relayed via the net to appropriate agencies throughout the state. W4BYL represented Roanoke and W4DUQ was on hand for Montebello. These three stations maintained contact for 41 hours on Oct. 31 and approximately six hours on Nov. 1. W4OVN acted as net control during the first part of the emergency sessions and W4BGP during the latter. Stations throughout the eastern United States were kept informed of the progress. FCC invoked voluntary clearance of the channel 3830-3840 kc during this emergency. — W4BGP.

At the rate we are going, we will soon have a pretty accurate overall check on the status of our AREC each month. Thirteen of the SECs reported September schedules. The ARRL sections are a good step closer to the halfway mark in monthly SEC reporting. AREC members in these sections, according to these reports, totals 11,273. Two sections, Michigan and Eastern Florida, report AREC membership at about a thousand. One new section, Oklahoma, submitted its first report for 1959. The number of different sections heard from so far in 1959 now stands at 49. You SECs that don't send in monthly reports are going to get lonely pretty soon. How about joining the crowd? SECs reporting are: S Texas, UTI, MCH, Ala, NER, N Dakota, Wash., San Joaquin Valley, E Fla., N Mex., Tenn., S Dak., Kans., W. N. Y., Colo., E Pa., E Bay, N Texas, Okla., Ore., Utah, Md., Del., N J, C., Nyo., Md., Serra Clara Valley, Maritime, Vt., W. Mass., Minn., Ind., NYC-1, W Va., Wis. If we get past the halfway mark, we'll start listing the sections not heard from.

RACES News

Your NAR occasionally gets invited to attend O'CDM communications conferences, and always accepts if at all possible. The most recent one was the O'CDM Region IV Communications Conference, held at OCDM Operational Headquarters in Bumble Creek, Minn., which is also Region IV headquarters. This took place in late November. Usually nearly half of the people attending these conferences are amateurs, but we think the percentage was rather lower than that for this one. The rest were communications and/or warning officers, non-amateur users, technical directors, agency or manufacturers representatives, etc. A good many of them knew nothing whatever about communications, and some of them very little about civil defense. Yet, this was a civil defense communications conference. (One O'CDM official explained that this was a means of getting good attendance, that the heads of services might attend functions such as these if the program looked reasonably attractive, whereas they might hesitate to send communications specialists — which struck us as a rather cynical outlook, but he's probably right.)

And indeed, much of the program had little if anything to do with ed. communications. Mr. James McGlany, Region IV communications officer, opened the conference by mentioning the "islands of communication" that exist within states and communities, many of them unaware of each other's efforts, and some not knowing even their own communication needs. We communicators, Mr. McGlany said, must interpret and anticipate; this is part of our job.

We wish there was room here to give you a full report of the conference. For the nonce, it will have to suffice to say that it was interesting, instructive and well-run; and although from our own standpoint we could have wished for a more strict adherence to the communications theme, the trip and the time spent were well worth while in terms of broadening experience and acquaintanceship. We met and chatted with (some again, some for the first time) amateurs from all five states of the region, with amateurs from O'CDM operational headquarters and the various O'CDM regions attending, with representatives from FCC and various manufacturers of communications equipment; and if we didn't learn much new about ed. communications, we absorbed a great deal of basic understanding of the overall civil defense picture.

TRAFFIC TOPICS

Tis said that "nothing succeeds like success," and this must be true, because now that NTS is a going organization and still expanding its scope and facilities, it seems that everybody and every net wants to join it. We get quite a few letters asking us how.

For the individual traffic-inclined amateur, the answer to this is easy: take part in your section NTS net. Most sections have them, either on c.w. or phone or both. If yours is one of the sections that don't have an NTS net, there is nothing to prevent your forming one. Just get a copy of CD-24 to see what an NTS section net is supposed to do, then start organizing.

As a matter of fact, that's about the only way that a net can join NTS — by being organized specifically for the purpose. If the net is not formed with this in mind, some modifications will inevitably have to be made later in order for it to be considered a part of the system; for each net has specific meeting times, must perform specific functions, and must conduct specific liaison assignments if it is to do its job as a single link in the chain. For years we have fought to hold the line on this, to prevent NTS from deteriorating into a conglomerate of nets each going its own way about
BRASS FOUNDERS LEAGUE

Winners of BFL Certificates for October traffic:

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More Than One-Operator Stations

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More Than One-Operator Stations

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More Than One-Operator Stations

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Traffic reports.

January 1960

83
A.R.R.L. ACTIVITIES CALENDAR

Jan. 7: CP Qualifying Run — W6OWP
Jan. 9-10: V.H.F. Sweepstakes
Jan. 15: CP Qualifying Run — W1AW
Jan. 16-17: CD Party (c.w.)
Jan. 18-19: CD Party (phone)
Jan. 21-22: ARRL DX Contest (phone)
Jan. 31-Feb. 15: Novice Roundup
Feb. 3: CP Qualifying Run — W6OWP
Feb. 5-7: DX Competition (phone)
Feb. 9: Frequency Measuring Test
Feb. 15: CP Qualifying Run — W1AW
Feb. 19-21: DX Competition (c.w.)
Mar. 5: CP Qualifying Run — W6OWP
Mar. 7-8: ARRL DX Competition (phone)
Mar. 15: CP Qualifying Run — W1AW
Mar. 18-20: DX Competition (c.w.)
June 25-26: Field Day

OTHER ACTIVITIES

The following lists data, name, sponsor, and page of this QST in which more details appear.

Jan. 9-10: WARE DX Contest (c.w.). DARC (p. 77, this issue).

2 Section nets reporting: MDJUX, MDD (Md.-Del.-D.C.), NEB (Neh.), SCS (Calif.), SD (S.D.), W8CN, W8CTQ, W9R, W9NN, W9YN, (Va.), MN, MN, KY, KPN (Ky.), AEOE, AEOE, AEOE (Ala.), C7M, Gator, TPTN (Fla.), Tenn. CW, Tenn. S. Low, TLDN (Iowa), MN, MN, EP, MN, Noon, MHN (Minn.), S. Dak., SD, 40 Phone, S. Dak., 75 Phone, S. Dak., CW, CPN (Conn.), I2N (III.), WZM (W. Va.), WZM (Wash.), BCN (B. C.), SCN (S. C.), KS (Kans.), GS (Ga.).

3 TCC functions performed, not counted as net sessions.

Even with one region net and one TCC report missing, we smash previous records, including the average traffic per session. This latter is something we do every month. A nice October performance, fellows!

Section net certificates have been awarded to K6HAN (WPX), W6QCD (RN) and W6XJO (RN) manager W1BVR. W2PH is back in the saddle in 2RN and notes that the teen age set takes over during the summer months just as the vacation sea is leaving, a very workable arrangement for all. Many hams have been mentioned.

Correction: K5QNF is not the new RN3 manager (too busy with school), but is acting until one can be appointed; the search goes on. K6HLM has modified his RN6 log sheet so it is usable for all TNS nets; if enough interest is shown, he will get prices on having them printed up. K6KBD takes over 2RN reporting starting w. Nov. August, thanks to W2TOF. For a fine job, K9WEDC is the new manager of TWC, replacing W5DWB, whose business necessitated his resignation. EAN manager W6GZC notes that in October 2RN missed being represented on EAN on one session, its first miss in over four years; quite a record. W9DO is pleased with the operation of CAN, although TCC liaison to EAN gives them some trouble. W6PGEL writes a nice chat letter on the back of his QSL card, the upshot of which is that PAN is having its troubles but is coming along all right, and Clem is feeling much better, thanks.

Transcontinental Corps. A TCC station may report into your NTS net, at any level, to distribute traffic. If this happens, you usually have some other traffic to get rid of on other nets, so don’t hold him up if it can possibly be avoided. Get his traffic cleared and get him on his way. TCC stations are the only ones in NTS who are encouraged to “net log” — but this for distributing received traffic, not for receiving

it. The traffic should be received at area level only. October Reports:

Summary:

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The TCC roster: Central Area (W6BDK, Director) — W6BLC, SCA, BDR, LGW, W9CXY; Pacific Area (W6-EOT, Director) — K6a, OYF ZYX HLR RYR JDW 078 EOT WPF WZC HC CMA, K7CWY, W7a GMC ZB BDJ, K6a EDD EDR, W6a ANA KQD.

CONTEST NOTES

The following little gems of error crept into the ARRL International DX Competition Results, as reported in October QST. W6WFD should have been listed as the c.w. winner for the Northern California DX Club. His score added, the Northern Northern DX Club with 4,833,610 points to overall the Southern California DX Club with their correct score of 4,593,606 points. Therefore, the standings are reversed with the Northern club third, and the Southern club fourth. Add W6BXL to the disqualified list.

Multi-band station VE2M was incorrectly listed as VE2BE, one of the operators. W90M’s c.w. entry was listed with the scores of East Bay, WAAI should have been listed as AA4AGL, WAAKVB was incorrectly listed as AA4KVB.

Apologies to all concerned for the above incorrect listings.

WIAW OPERATING SCHEDULE

(All times given are Eastern Standard Time)

WIAW returned to its Fall-Winter operating schedule with the return to Standard Time. General operation covers all amateur bands on which WIAW has equipment. The following periods include operation on 3.5 and 21 Mz. (see footnote 2 in box on p. 76, November QST). Master schedules showing complete WIAW operation in EST, CST or PST will be sent to anyone on request.

Operating-Visiting Hours:

- Monday through Friday: 1500-0300 (following day).
- Saturday: 000-0230 (Sunday).
- Sunday: 1300-2230.

Exceptions: WIAW will be closed from 0000 Jan. 1 to 0000 Jan. 2 in observance of New Year’s Day, and from 2230, Feb. 21 to 1500 Feb. 23 in observance of Washington’s Birthday.

General Operation: Use the chart (p. 76, November QST) for determining times during which WIAW engages in general operation on various frequencies, phone and c.w. Note that since the schedule is organized in EST, certain morning operating periods may fall on the evening of the previous days in western time zones. WIAW will participate in all official ARRL operating activities, using scheduled general operating periods for this purpose if necessary.

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

- Frequencies (ke.): C.w.: 1820, 3555, 7050, 14,100, 21,075, 28,080, 50,000, 145,800.
- Phone: 1820, 3945, 7255, 14,390, 21,330, 29,000, 50,000, 145,800.

Frequencies may vary slightly from round figures given; they are to assist in finding the WIAW signal, not for exact calibration purposes.

Times:

- Sunday through Tuesday: 0000 by c.w., 2100 by phone.
- Monday through Saturday: 2230 by phone, 2100 by c.w.

Code Proficiency Practice: Times and procedure on the above listed c.w. frequencies (except 1820 ke.) starting at 2130 daily. Speeds are 16, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7, 14, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately ten minutes of practice is given at each speed.

Exceptions: On Feb. 9, WIAW will transmit a special Frequency Measuring Test and on Jan. 15 and Feb. 15, WIAW will transmit ARRL Code Proficiency Qualifying Runs instead of the regular code practice.
RESULTS, OCTOBER CD PARTIES

Two Louisiana boys battled it out for top honors in the October c.w. CD Party. For the second Party in a row, K5DI came out on top, with 287,000 points and 815 contacts in 20 sections. Top QSO figure and second highest score went to K5BSW who racked up 819 contacts in 60 sections, good for 283,953 points. Round out the top five were W4KFC, W1RN, and K6SXA, who once again proved you can score big from the west coast.

The phone bit was taken by W1EC, who again battled his way to the top of the heap. Gary scored 147 QSOs in 28 sections to lead by quite a comfortable margin over K3PHF, with 105 contacts in 28 sections, K2LXJ, K1MD (ex-K5QG), and W5NF, rounded out the top five.

The following are the high claimed scores. Figures show score claimed, number of QSOs, and number of different sections worked. Final and complete standings will appear in the January CD Bulletin.

<table>
<thead>
<tr>
<th>C.W.</th>
<th>K5JLF</th>
<th>117,740-320-38</th>
<th>K5BGT</th>
<th>113,750-320-20</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>W4DVT</td>
<td>113,390-340-54</td>
<td>W5DR</td>
<td>122,550-340-60</td>
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<td>K5MA</td>
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<td>W4BON</td>
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<td>W6SK</td>
<td>105,750-350-51</td>
<td>W4TRO</td>
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<td>W5DAD</td>
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<td>W4KPU</td>
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<td>W6AO</td>
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<td>W6WY</td>
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<tr>
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<tr>
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<td>W5DR</td>
<td>113,750-320-20</td>
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<tr>
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<td>W5A</td>
<td>117,740-320-38</td>
<td>W5DR</td>
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</tr>
<tr>
<td></td>
<td>W5A</td>
<td>117,740-320-38</td>
<td>W5DR</td>
<td>113,750-320-20</td>
</tr>
</tbody>
</table>

RTTY NOTES

Results of the RTTY Sweepstakes of October 30 and 31 have been received from WA6KE of the RTTY Society of Southern California. Leading the pack was W3C6Z with 8610 points with 108 contacts in 40 different sections. Close behind in contact total was W2RUI with 99 to score second high with 6732 points. Of the 152 stations reported active in the contest, 48 submitted log entries.

The figures after each call in the listing show score, number of QSOs, and number of different ARRL sections worked.

<table>
<thead>
<tr>
<th>Calls</th>
<th>Score</th>
<th>QSOs</th>
<th>Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3C6Z</td>
<td>8610</td>
<td>108</td>
<td>40</td>
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<tr>
<td>W2RUI</td>
<td>6732</td>
<td>99</td>
<td>67</td>
</tr>
<tr>
<td>W6YJT</td>
<td>8600</td>
<td>108</td>
<td>40</td>
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<tr>
<td>W6YJK</td>
<td>8580</td>
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<td>40</td>
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<tr>
<td>W6YFG</td>
<td>8560</td>
<td>100</td>
<td>40</td>
</tr>
<tr>
<td>W6YMD</td>
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<td>W6YMG</td>
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<td>35</td>
</tr>
<tr>
<td>W6YFO</td>
<td>8480</td>
<td>60</td>
<td>35</td>
</tr>
<tr>
<td>W6YFA</td>
<td>8480</td>
<td>50</td>
<td>35</td>
</tr>
</tbody>
</table>

Leading the phone gang is no new game for W1EC. Gary's DX-100 came through with 147 contacts in 28 sections for 21,560 points. An audio change, described by Gary in "Hints and Kinks," November QST, is a boon, no doubt, to scoring big.

January 1960
Walt Erner, W8AEU, receives the "Amateur of the Year" award from Jack Siringer, W8AWJ, convention chairman, at the Cleveland Amateur Radio Convention banquet, Oct. 17. And well-deserved it is. Walt, EC for Cuyohoga Co., Ohio, has over 300 AARC members enrolled throughout the county in one of the most active, if not the most active, AARC groups in the country.

**DXCC NOTES**

Announcement is hereby made of the addition to the ARRL Countries List of Cargados Carajos, VQS. Cargados Carajos Shallows is located in the Indian Ocean approximately 240 miles east of Port Douglas. Both of these additions are made by virtue of point 2 as explained in the July 1950 QST, page 81.

DXCC credit will be given starting March 1, 1960 for creditable confirmations dated on or after November 15, 1945. This is to permit foreign amateurs to start receiving credits at the same time as those in the U. S. A. Confirmations received prior to March 1, 1960 for these countries will be returned without credit.

We wish again to call attention of workers for DXCC to Rule 11 of conditions for that award. This rule was written to assure high ethical standards for all DXCC-credited amateurs. Unfortunately there have been some, each year, who submit manufactured or altered confirmations to attain the award. Any confirmations submitted for DXCC credit should be reviewed with Rule 11 in mind. ARRL has to base disqualifications directly on any confirmation as submitted. Necessarily the rule cannot be concerned with who may have made a patent alteration, so before you submit cards or other evidences, scan them most carefully. If any have reached you with marks-over or are wrong in other respects, avoid disqualification by going after a new card at the source. Complete rules are in every Handbook, in every copy of Operating an Amateur Radio Station and appear on the Operating Aid No. 7, the Countries List. A line to Headquarters will bring a copy of the DXCC Rules.

The Countries List which appears with the announcement of the ARRL International Competition is for use in the 1960 Competition only. It is not a complete DXCC Countries List. The complete Countries List is available on request.

**CODE PROFICIENCY PROGRAM**

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Jan. 15 at 2130 Eastern Standard Time. Identical transmissions will be sent simultaneously by automatic transmitters on 3555, 7040, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W9OWP only will be transmitted Jan. 7 at 2130 EST on 3555 and 7040 kc.

Any person may apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 25 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST. Appropriate 30-minute 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 list, hook up your own key and audio oscillator and attempt to send in step with W1AW.

**SUPPLEMENT TO NET DIRECTORY**

The following listing will supplement and correct the listing on page 79, November QST. Please inform us promptly of any errors or omissions so that they can be included in the March QST installment. An asterisk (*) indicates correction from previous listing in November QST. A double asterisk (**) indicates net is part of the ARRL National Traffic System. This listing is subject to change as of Nov. 1, 1959. Registrations received after that date will appear in the March QST supplement.

Net registrations that do not show a traffic or emergency purpose are not included. Only nets which have been registered or reregistered since Aug. 1, 1959, are included. This list does not include nets listed in November QST unless a change is shown.

Important note: Net registration lists are for information only. Insofar as possible, net information is listed exactly as received. Certain common abbreviations are used to conserve space in net names, and under column headed "Days" the following abbreviations are used: Sm, Sunday; M, Monday; T, Tuesday; W, Wednesday; Th, Thursday; F, Friday; S, Saturday; Dy, Daily, including Sunday; 1/M, first Monday of month & similar; 1/3M, first and third Mondays of month & similar. Listing in QST or the annual ARRL cross-indexed net directory does not signify necessarily that net listed have any official status, does not entitle them to exclusive or prior right to the frequency or frequencies on which they are registered, and is in no sense a form of endorsement.
Atlanta 10 Meter Phone Net 29,600 2300 EST Sn
Badger VHF Club Net (W/VIH/FCN) 51,100 2000 CST Sn
(Bi-Wk)
Baltimore County Emerg. Net ... 29,250 2130 EST J/M
Barry Amateur Radio Net (Mich.) 50,250 2100 EST M
Beverly Valley Emerg. Net 14,250 2100 EST W
Beaumont County AM & EM Net (N.Y.) 29,120 2200 EST M
Bellefonte Net (N.J.) 14,250 0530 EST M
Berrien County Emerg. Net (BCECN) (Mich.) 29,610 1430 EST La/Sn
(BCECN) (Mich.)
Birmingham Mobile Emerg. Net Ala 29,500 1500 CST F
Boston Red Cross Net (BRCN) 29,050 2000 EST M
Breakfast Club Net 3972 0400 CST Dy
British Columbia Emerg. Net (BCECN)** 3650 1900 PST M-S
British Columbia Emerg. Net (BCECN)** 3650 2200 PST M-S
Brown County Regional AREC Net (N.Y.) 50,400 2100 EST F
Brown County Emerg. Net (B.C.E.N.) Waves Chem. (N.J.) 3950 1330 CST Sn
Burlington County RACES Net (N.J.) 29,630 1945 EST F
Cedar Valley 6 Meter Civil 6000 1130 EST M
Defense Net (CVCDN) (Iowa) 145,260 1900 EST M
Central Area Net (CAI)** 3670 2000 CST Dy
Central Pa. Operational C.D. Net (CENOFA)** 115,210 0700 EST M-Th
Central Ill. Net (CIN)** 1815 0830 CST Sn
Central Mass. Net 3930 0730 CST S
Central Texas Emerg. Net 3870 0830 CST Sn
Champion Hills Net (CCH) (L.C.) 145,800 1830 PST M-F
Chicago 8PM-1 AREC Net 1617,200 0600 CST Dy
Chicago 8PM-1 AREC Net 145,200 2000 CST Th
Chicago 6-Meter IACNE Net 50,840 2200 CST Th
Chilicothe Emerg. Net 2-Meter Net (CCARECN) (Vt) 114,500 1110 EST M-S
Colorado 15 Meter Net (CMW)** 3655 2200 MST M-F
Conoco Weather Net (CWNX)** 3945 0945 MST M-S
Concord Emerg. AARC Net (Mass.) 145,820 2100 EST M
Conn. 6 Meter Phone Net (CPSN) 50,809 1845 PST M-Th
Conn. VHF FPO & Emerg. Net** 145,860 2000 EST MWF
Cooke State Net (CSS)** 3830 1800 PST M-F
CQ Club Radio Net (Conn.) 116,700 1900 EST T
Cumberland Valley Amateur Radio Club Emerg. Net (Pa.) 29,100 2200 EST Sn
Deep Sleep Dreamer (DSD)** 3076 1415 EST M-S
Del Co AREC 10 Mtr Net (Pa.) 29,050 2130 EST Sn
Delaware Emerg. 3950 1830 EST Sn
Dog Home Net 29,050 1800 EST M
Dusty Bird Transmon Net (EDB) 3915 0500 CST Dy
East Central Inid. GM Phone Net 29,120 2100 EST M-S
Eastern Area NET (EAN)** 3670 2030 CST Dy
Eastern Area Slow Net (EASN) 3745 1800 EST Dy
Eastern Mass. Net (EMN)** 3690 1900 EST M
Eastern Standing Track Age Net (EASN) 7250 1830 EST M
Eights Regional Net (MRN)** 3330 1915 EST Dy
El Paso Ten Meter Emerg. Net 29,630 1830 EST M
Eastcom One Net (Rt. 66) 29,630 1900 EST M
Everett Emerg. CD Net (Mass.) 29,650 2030 EST M
Evergreen Emerg. Net (Wash.) 51,000 1830 PST TTh
Evergreen State Net 3920 1700 PST M-S
Finger Lakes Net (N.Y.) 145,260 1930 EST M
Five Towns Net (N.Y.) 145,100 2000 EST M
Florida (East & West) Net (QFN)** 3050 1830 EST Dy
Frieso Net 3810 0900 EST S
Fulton County Amateur Net (Ill.) 3810 1230 EST Sn
Fulton County (O.) Net 1821 2000 EST W
Gn. Cracker Mobile Net 3985 1500 EST Sn
Gn. Cracker Net 3985 0900 EST Sn
Gn. Teen-Age Net (GTN) 7125 1800 EST S
Gn. Teen-Age Net (GTN) 7290 1800 EST S
Granite State Phone Net (GSNP)** 3882 1100 EST Dy
The Greyhound Network 3885 0900 EST Dy
Greater Atlantic VHF & 6 Meter Net 50,200 2039 EST F
Green Mountain Net (GMN)** 3855 1700 EST M-S
Gulf Coast SSE Net 3925 1700 CST Dy
Hair Pin Net 29,120 1300 EST T
Hamk Butcher's Net 7290 1200 CST M-F
Hamilton County Emerg. Net (Iowa) 1818 1300 CST T
Handy Capper 100 Meter Emerg. Net 7290 0830 CST MFS
Hi-Plains 100 Meter Emerg. Net 1818 1300 CST MTh
Idaho Weather Net 3970 0700 MTh S-M
Illinois CW Net (ILN)** 3515 1900 CST M-S
Illinois Emerg. Net (IEN) 3915 0800 EST S
Illinois Emerg. Net (IEN) 3040 0800 CST Sn
Ind. Mich., Ohio Net (IMO) 50,250 1815 EST M-F
Indiana Phone Net (IPN)** 3010 0900 CST Dy
Ind. State Traffic Net (QTC)** 3565 1000 EST Dy
Ind. State Training Net (QTN) 3745 1800 CST MWF
Interstate Phone Net (IPR) 3980 1330 EST M-S
Iowa City Six Meter AREC Net (W) 20,200 1130 EST T
Jasper County Emerg. Net (Iowa) 1810 1830 CST Th
Jefferson Six Meter Net (La.) 50,100 2200 EST T
Johnson County Digital Net (Iowa) 29,630 2000 EST M
Johnson-Winnebago 10 Meter Net (Iowa) 50,100 2100 CST M-F
Kankakee Area Net (IIL) 3920 1200 CST Dy
Keep Mmm. Green Emerg. Net (KMM)** 3810 1000 CST Dy
Kosciusko Emerg. and Traffic Net (Ind.) 29,480 2130 EST Sn
Kent Emergency Net (Mich.) 50,550 2000 EST M
Kentucky Traffic Net (KTN) 2000 2200 EST M
Kv, Special Net (KSN)** 3978 1800 EST CST M-F
Ky. VHF net (KYM) 1830 1700 EST CST M-F
Kings County AARC (CD 2) 145,200 2730 CST M
Kings Net (N.Y.) 50,400 2030 EST M
Kings County RACES-AREC 6 Meter Net (N.Y.) 50,400 2030 CST Th
Kings County RACES-AREC 10 Meter Net (N.Y.) 50,400 2100 CST 1/M
KumYR Repeater Net (Calif) 145,190 0630 EST Dy
Knox County Six-Meter Emerg. Net (KEN) (Tenn.) 50,100 1800 EST M-F
Lakeside Road Net (LSR) 3950 1700 MWF
Lakeland Slow Speed Net (LSS) 3950 1700 CST M
Lambertville (Ky.) Area Radio 29,120 1800 CST M
Emerg. Nets 55,000 1700 CST M
Lindon Mobile Net 145,200 2000 EST M
Madison VHF Net (Wis.) 50,100 2000 CST Th
Maine State Slow Speed CW Net 3726 1730 EDT TThS
Mashpee Mobile Emerg. Net (Mass.) 50,250 2000 CST M
Maiden Emerg. Net (Mass.) 50,250 2000 EST M
Manchester Emerg. Net (N. H.) 26,000 1900 EST F
MANCROAD Net (Wis.) 3730 1030 CST Sn
Manitou Net 3985 1330 EST Dy
Manhasset Net 3975 1215 CST Dy
Marrakek Dry Heat (MD) 3050 1830 EST Dy
Miami Emerg. Net (MEPN) 3820 1300 EST Ssn
Mid. State Emerg. Net (MEPN) 50,250 2100 EST W
Mid. Six Meter Emerg. Net 50,250 2100 EST W
Michigan State Net 3810 1215 M-F
Michigan City Red Cross Disaster Net (Mich.) 29,650 2100 EST M
Mass. Phone Net (MPN)** 3870 1800 EST Dy
MDFN MD DEL & DC Net** 3870 1015 EST M-S
MDFN CD Net (M) 29,480 0900 EST M-S
Miami Valley Emerg. Net 1820 0900 EST Sn
Miami Valley VHF Net (Ohio) 50,140 2100 EST S

January 1960
ANNUAL MEETING OF THE UNION ELECTRICAL TELEGRAPH ASSOCIATION WILL BE HELD AT 6:00 P.M. ON OCTOBER 12TH AT THE MIDDLETOWN SKYWAY IN NEWARK, NEW JERSEY. THE MEETING WILL BE CONCERNED WITH THE PROMOTION OF THE INTEREST OF THE UNION IN THE FIELD OF TELEGRAPHY.
WHAT HATH JIM WROUGHT?

SOME months ago I wrote about an electronic keyer I was hoping to use, and named some amateurs who already were proud owners of same. At that time I wanted to identify the designer of this remarkable job; but he asked me, very modestly, to not mention his name.

NOW that increasing numbers of CW men are using this keyer, Jim Ricks, W9TO, has consented to have his identity known. More than that, we have arranged to manufacture the keyer — but you'll hear more about that later.

MAYBE it's my imagination, but it seems the number of CW men and women is growing. At this writing I've worked relatively few YL's on CW; but I've heard some fine operators signing "Flo", "Mae", and "Eileen". May their number continue to grow!

BUT back to Jim and his keyer. Jim tells me that the keyer utilizes digital techniques in simple circuitry to form self-completing dots and dashes, which are always in the correct ratio. Adjusting the speed changes only the speed; the ratio and the weight of the characters remain constant just as they do when tape sending is employed.

OF COURSE, an operator must be hooked up to the keyer and that's where the fun comes in. Listen any Sunday on 14345 at 12 noon EST and hear W6UF tell W9AIO, "let's wind it up". (They mean above 50 W.P.M.) Listen any evening to the key merchants between 7 and 7.1 mc. As someone commented, "If you get into one of those QSO's, you'd better fasten your seat belt."

BUT it's not necessary to "wind it up" to enjoy an electronic keyer. You can vary the speed to anything you want, and you'll find you can easily send and receive good copy at speeds much faster than you've been used to . . . and this makes for lots of fun. To those of us who know and like CW, it's hard to beat as a source of real enjoyment.

—— BILL HALLIGAN, W9AC
No matter what you expect from a transmitter... You'll get more with a VIKING!

"RANGER" — 75 watts CW and 65 watts phone input. Bandswitching 160 through 10 meters. Built-in VFO or crystal control. With tubes.
Cat. No. 240-161-1. Kit $229.50
240-161-2. Wired $329.50

Cat. No. 240-104-1. Kit $349.50
240-104-2. Wired $439.50

"FIVE HUNDRED" — 600 watts CW input; 500 watts phone and SSB (P.E.P. with aux. SSB exciter). Bandswitching 80 through 10. With tubes.
Cat. No. 240-500-1. Kit $749.50
240-500-2. Wired $949.50

"THUNDERBOLT" AMPLIFIER — 2000 watts P.E.P.* input SSB; 1000 watts CW; 800 watts AM linear. Continuous coverage 3.5 to 30 mcs. With tubes.
Cat. No. 240-353-1. Kit $524.50
240-353-2. Wired $589.50

"6N2" — Instant bandswitching coverage of both 6 and 2 meters. Power input rated at 150 watts CW and 100 watts AM phone. With tubes.
Cat. No. 240-201-1. Kit $129.50
240-201-2. Wired $169.50

"6N2" THUNDERBOLT AMPLIFIER — Input rated 1200 watts P.E.P.* SSB and DSB. Class AB: 1000 watts CW, Class C: 700 watts AM linear, Class A. Continuous coverage 6 and 2. With tubes.
Cat. No. 240-362-1. Kit $524.50
240-362-2. Wired $589.50

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 watts 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: 10 watts RF and 10 watts audio for AM; 10 watts peak for SSB.
Cat. No. 240-1000 . Wired and Tested $1399.00
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 2000 watts or more, depending upon individual voice characteristics.
Here's power and peak performance in a compact, desk-top Class B linear!

Rated a solid one-half kilowatt P.E.P. input with an auxiliary SSB exciter - 500 watts CW and 200 watts AM! Continuous coverage 3.5 to 30 mcs. Drive requirements: 5 to 35 watts depending upon mode and frequency desired. Employs two 811A triodes in parallel - wide range pi-network. Fully TVI suppressed, dozens of other fine features! With tubes.

Cat. No. | Amateur Net
---------|----------------
240-352-1 | $244.50
240-352-2 | $289.50

Popular Johnson station accessories...

"KW2" CONVERTER — Provides instant front panel switching from normal receiver operation to either 6 or 2 meters. Available Kit or wired in either 26 to 30 mcs; 26 to 30 mcs; 14 to 18 mcs; or 30.5 to 24.5 mcs, Specify range desired. With tubes.

Cat. No. | Amateur Net
--------|-----------
Kits | $59.95
Wired Units | $89.95

VIKING "MATCHBOXES" — Provides completely integrated antenna matching and switching systems for KW or 275 watt transmitters. Bandswitching 60, 40, 20, 15 and 10 meters. Available with or without directional coupler and indicator.

275 WATT "MATCHBOX"
Cat. No. | Amateur Net
---------|----------------
250-22 | $84.50
250-23 | Less coupler and indicator $54.95

KILOWATT "MATCHBOX"
250-30-3 | With coupler and indicator $149.50
250-30 | Less coupler and indicator $124.50

NEW CATALOG
Your complete guide to amateur radio's most exciting equipment. Write today for your free copy, and you'll soon see why your best transmitter buy is a Viking!

FIRST CHOICE AMONG THE NATION'S AMATEURS

E. F. JOHNSON COMPANY • WASECA, MINNESOTA
"SENeca" VHF HAM TRANSMITTER KIT
Beautifully styled and a top performer of highest quality throughout. The "SENeca" is a completely self-contained 6 and 2 meter transmitter featuring a built-in VFO for both 6 and 2 meters, and 4 switch-selected crystal positions, 2 power supplies, 5 radio frequency stages, and 2 dual-triode audio stages. Panel controls allow VFO or crystal control, phone or CW operation on both amateur bands. An auxiliary socket provides for receiver muting, remote operation of antenna relay and remote control of the transmitter such as with the Heathkit VX-1 Voice Control. Features up to 120 watts input on phone and 140 watts on CW in the 6 meter band. Ratings slightly reduced in the 2 meter band. Ideal for ham operators wishing to extend transmission into the VHF region. Shpg. Wt. 56 lbs.

HEATHKIT DX-20 $35.95

DX-20 CW TRANSMITTER KIT
Designed exclusively for CW work, the DX-20 provides the novice as well as the advanced-class CW operator with a low cost transmitter featuring high operating efficiency. Single-knob band switching covers 80, 40, 20, 15 and 10 meters using crystals or an external VFO. Pi network output circuit matches antenna impedances between 50 and 1,000 ohms. Employs a single 6DJ8A tube in the final amplifier stage for plate power input of 50 watts. A 6G6G serves as the crystal oscillator. The husky power supply uses a heavy duty 5U4GB rectifier and top-quality "potted" transformer for long service life. Easy-to-read panel meter indicates final grid or plate current selected by the panel switch. Complete RF shielding to minimize TVI interference. Easy-to-build with complete instructions provided. Shpg. Wt. 19 lbs.

HEATHKIT VX-1 $159.95

HEATH COMPANY, Benton Harbor, Michigan
"CHEYENNE" MOBILE HAM TRANSMITTER KIT
All the fun and excitement . . . plus the convenience of mobile operation are yours in the all-new Heathkit "Cheyenne" transmitter. The neat, compact, and efficient circuitry provides you with high power capability in mobile operation, with low battery drain using carrier-controlled modulation. All necessary power is supplied by the Model MP-1 described below. Covers 80, 40, 20, 15 and 10 meters with a 90-watt input on phone. Features built-in VFO, modulator, 4 RF stages, with a 100W final amplifier and pin network (coaxial) output coupling. High-quality components are used for long service life and reliable operation, along with rugged chassis construction to withstand mobile vibrations and shock. Thoughtful circuit layout provides for ease of assembly with complete instructions and detailed pictorial diagrams to insure success. A spotting switch is also provided. A specially designed ceramic microphone is included to insure effective modulation with plenty of "punch". Plan now to enjoy the fun of mobile operation by building this superb transmitter. Shpg. Wt. 19 lbs.

"COMANCHE" MOBILE HAM RECEIVER KIT
Everything you could ask for in modern design mobile gear is provided in the "Comanche" . . . handsome styling, rugged construction, top-quality components . . . and, best of all, a price you can afford. The "Comanche" is an 8-tube superhet receiver operating AM, CW and SSB on the 80, 40, 20, 15 and 10 meter amateur bands. A 3 mc crystal lattice-type IF filter permits the receiver to use single conversion without image interference, and at the same time creates a steep sided 3 kc flat top IF bandpass characteristic comparable to mechanical type filters. The neat, compact and easy-to-assemble circuitry features outstanding sensitivity, stability and selectivity on all bands. Circuit includes an RF stage, converter, 2 IF stages, 2 detectors, noise limiter, 2 audio stages and a voltage regulator. Sensitivity is better than 1 microvolt on all bands and signal-to-noise ratio is better than 10 db down at 1 microvolt input. One of the finest investments you can make in mobile gear. Shpg. Wt. 19 lbs.

MOBILE SPEAKER KIT
A matching companion speaker for the "Comanche" mobile receiver. Housed in a rugged steel case with brackets provided for easy installation on fire wall or under dashboard, etc. Uses 5 PM speaker with 8 ohm voice coil. Measures 5 ½" H x 5" W x 2 1/4" D. Shpg. Wt. 4 lbs.

MOBILE POWER SUPPLY KIT
This heavy-duty transistor power supply furnishes all the power required to operate both the MT-1 Transmitter and MR-1 Receiver. It features two 2N44 transistors in a 400 cycle switching circuit, supplying a full 120 watts of DC power. Under intermittent operation it will deliver up to 150 watts. Kit contains everything required for complete installation, including 12" of heavy battery cable, tap-in studs for battery posts, power plug and 15" of connecting cable. Chassis size is 9 ½" L x 4 ¼" W x 2" H. Operates from 12-14 volt battery source. Circuit convenience provided by self-contained relay which allows push-to-talk mobile operation. Shpg. Wt. 8 lbs.

MOBILE BASE MOUNT KIT
The AK-6 Base Mount is designed to hold both transmitter and receiver conveniently at driver's side. Universal mounting bracket has adjustable legs to fit most automobiles. Shpg. Wt. 5 lbs.

POWER METER KIT
This handy unit picks up energy from your mobile antenna and indicates when your transmitter is tuned for maximum output. A variable sensitivity control is provided. Features a strong magnet on a swivel-mount for holding it on a car dashboard or other suitable spot. Has its own antenna or may be connected to existing antenna. Sensitive 200 ua meter. Shpg. Wt. 2 lbs.

HEATHKIT MT-1
$99.95

HEATHKIT MR-1
$119.95

HEATHKIT AK-7
$5.95

HEATHKIT AK-6
$4.95

HEATHKIT PM-2
$12.95
"APACHE" HAM TRANSMITTER KIT
The many features and modern styling of the "Apache" will provide you with just about everything you could ask for in transmitting facilities. Emphasizing high quality the "Apache" operates with a 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, built-in switch selected circuitry provides for single-sideband transmission using the SB-10 External adapter. The newly designed, compact and stable VFO provides low drift frequency control necessary for SSB transmission. A slide rule type illuminated rotating VFO dial with full gear drive vernier tuning provides ample bandspread and precise frequency settings. The bandswitch allows quick selection of the amateur bands on 80, 40, 20, 15 and 10 meters. This unit also has adjustable low-level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation. The final amplifier is completely shielded for TVI protection and neutralized for greater stability. A cooling fan is also provided. The formed one-piece cabinet with convenient access hatch provides accessibility to tubes and crystal sockets. Die-cast aluminum knobs and control panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. A "spotting" push button enables the operator to "zero beat" an incoming frequency without putting the transmitter on the air. Equip your ham shack now for top transmitting enjoyment with this outstanding unit. Shpg. Wt. 110 lbs. Shipped motor freight unless otherwise specified.

HEATHKIT SB-10
$8.95
SINGLE SIDEBAND ADAPTER KIT
Designed as a compatible plug-in adapter unit for the TX-1 "Apache" transmitter, this unit lets you operate on SSB at a minimum of cost, yet does not affect the normal AM and CW functions of the transmitter. By making a few simple circuit modifications, the DX-100 and DX-100-B transmitters can be used, utilizing all existing RF circuitry. Extremely easy to operate and tune, the adapter employs the phasing method for generating a single-sideband signal, thus allowing operation entirely on fundamental frequencies. The critical audio phase shift network is supplied completely preassembled and wired in a sealed plug-in unit. Produces either a USB, LSB or DSB signal, with or without carrier insertion. Covers 80, 40, 20, 15 and 10 meter bands. An easy-to-read panel meter indicates power output to aid in tuning. A built-in electronic voice control with anti-rip circuit is also provided. 10 watts PEP output. Unwanted sideband suppression is in excess of 30 db and carrier suppression is in excess of 40 db. An EL34/6BK5 tube is used for linear RF output. Shpg. Wt. 12 lbs.

MODIFICATION KIT: Modifies DX-100 and DX-100-B for use with the SB-10 Adapter. Model MK-1. Shpg. Wt. 1 lb. $8.95.

HEATHKIT AR-3
$29.95
(less cabinet)
ALL-BAND RECEIVER KIT
A fine receiver for the beginning ham or short wave listener, designed for high circuit efficiency and easy construction. Covers 550 kc to 30 me in four bands clearly marked on a slide-rule dial. Transformer operated power supply. Features include: bandswitch, bandspread tuning, phone-stand-by-CW switch, phone jack, antenna trimmer, noise eliminator, RF gain control and AF control. Shpg. Wt. 12 lbs.
CABINET: Opt. extra. No. 91-15A. Shpg. Wt. 5 lbs. $4.95.

HEATHKIT QF-1
$9.95
"Q" MULTIPLIER KIT
Useful on crowded phone and CW bands, this kit adds selectivity and signal rejection to your receiver. Use it with any AM receiver having an IF frequency between 450 and 460 kc that is not AG-DG type. Provides an effective "Q" of approximately 4,000 for extremely sharp "peak" or "null". The QF-1 is powered from the receiver with which it is used. Shpg. Wt. 3 lbs.
OF DISTINCTIVE QUALITY

ACCESSORY SPEAKER KIT
Handsomely designed and color styled to match the "Mohawk" receiver this heavy duty 8" speaker with 4.7 ounce magnet provides excellent tone quality. housed in attractive 3/4" plywood cabinet with perforated metal grille. Speaker impedance is 8 ohms. Shpg. Wt. 7 lbs.

HEATHKIT AK-5 $9.95

“MOHAWK” HAM RECEIVER KIT
Styiled to match the "Apache" transmitter the “Mohawk” ham band receiver provides all the functions required for clear, rock-steady reception. Designed especially for ham band operation this 15-tube receiver features double conversion with IF’s at 1682 kc and 50 kc and covers all the amateur frequencies from 160 through 10 meters on 7 bands with an extra band calibrated to cover 6 and 2 meters using a converter. Specially designed for single sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled wired and aligned front end coil bandswitch assembly assures ease of construction and top performance of the finished unit. Other features include 5 selectivity positions from 5 kc to 500 CPS, bridge T-notch filter for excellent heterodyne rejection, and a built-in 100 kc crystal calibrator. The set provides a 10 db signal-to-noise ratio at less than 1 microvolt input. Each ham band is separately calibrated on a rotating slide rule dial to provide clear frequency settings with more than ample bandspread. Front panel features 5-meter, separate RF, IF and AF gain controls, T-notch tuning, T-notch depth, ANL, AVC, BEF, Bandswitch tuning, antenna trimmer, calibrate set, calibrate on, CW-SSB-AM, receive-standby, upper-lower sideband, selectivity, phone jack and illuminated gear driven vernier slide rule tuning dial. Attractively styled with die-cast aluminum control knobs and escutcheons. No external alignment equipment is required for precise calibration of the “Mohawk”. All adjustments are easily accomplished using the unique method described in the manual. An outstanding buy in a communications receiver. Shpg. Wt. 66 lbs. Shipped motor freight unless otherwise specified.

HEATHKIT AM-2 $15.95

REFLECTED POWER METER KIT
The AM-2 measures forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt of energy and covers 160 through 6 meters. Input and output impedance provided for 50 or 75 ohm lines. No external power required for operation. Use it also to match impedances between exciters or RF sources and grounded grid amplifiers. Shpg. Wt. 3 lbs.

HEATHKIT VX-1 $23.95

BALUN COIL KIT
Match unbalanced coaxial lines, found on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance with this handy transmitter accessory. Capable of handling power input up to 200 watts, the B-1 may be used with transmitters and receivers covering 80 through 10 meters. No adjustment required. Shpg. Wt. 4 lbs.

HEATHKIT B-1 $9.95

VFO KIT
For below the cost of crystals to obtain the same frequency coverage this variable frequency oscillator covers 160, 80, 40, 20, 15 and 10 meters with three basic oscillator frequencies. Providing better than 10 volt average RF output on fundamentals, the VF-1 is capable of driving the most modern transmitters. Requires only 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a. Illuminated dial reads direct. Shpg. Wt. 7 lbs.

HEATHKIT VF-1 $19.50
Save 1/2 or more...with Heathkits

HEATHKIT DX-100-B $189.50
HEATHKIT DX-40 $64.95

DX-100-B PHONE AND CW TRANSMITTER KIT
A long standing favorite in the Heathkit line, the DX-100-B combines modern styling and circuit ingenuity to bring you an exceptionally fine transmitter at an economical price. Panel controls allow VFO or crystal control, phone or CW operation on all amateur bands up to 30 mc. The rugged one-piece formed cabinet features a convenient top-access hatch for changing crystals and making other adjustments. The chassis is punched to accept sideband adapter modifications. Featured are a built-in VFO, modulator, and power supply, complete shielding to minimize TVI, and a pi network output coupling to match impedances from 30 to 72 ohms. RF output is in excess of 100 watts on phone and 120 watts on CW. Band coverage is from 160 through 10 meters. For operating convenience single-knob bandswitching and illuminated VFO dial on meter face are provided. A pair of 6L46 tubes in parallel are employed in the output stage modulated by a pair of 1625's. Shpg. Wt. 107 lbs. Shipped motor freight unless otherwise specified.

DX-40 PHONE AND CW TRANSMITTER KIT
An outstanding buy in its power class the DX-40 provides both phone and CW operation on 80, 40, 20, 15 and 10 meters. A single 6146 tube is used in the final amplifier stage to provide full 75 watt plate power input on CW or controlled carrier modulation peaks up to 60 watts for phone operation. Modulator and power supplies are built in and single-knob bandswitching is combined with the pi network output circuit for complete operating convenience. Features a 12' Aarrowal movement panel meter. A line filter and liberal shielding provides for high stability and minimum TVI. Provision is made for three crystals easily accessible through a "trap door" in the back of the cabinet. A 4-position switch selects any of the three crystals or jacks for external VFO. Power for the VFO is available on the rear apron of the chassis. Easy-to-follow step-by-step instructions let assembly proceed smoothly from start to finish even for an individual who has never built electronic equipment before. Shpg. Wt. 25 lbs.

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IS K6INII 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.

GOTHAM
1805 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, WAJD and IDXC 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 O. Gabbert, K6INII [Ex-TI2TG]

List of 105 countries/stations worked with 65 watts and a V-80 vertical

8V1US KG4AI VK5YL
CE3DZ KG6FAE VK5XX
ZL5AA KH6U VK9AT
CO2WD K178U VK8CJ
CN28K KM6AX VP2KA
CN4BF KP4ACP YP2AY
CR9AH KP6AL VP2DW
CT1CB KR68F VP2MX
CK2FD KS4AZ VP2LU
DL1R P8X4A VP5SW
DU7SV KW6CA VP5CP
EA1FD KZ6AF VP38H
E14K ZS5CS VP6TR
FBVQ LA3G VP7NH
F8BZ L120DF L17S
FG7XS L21KSP VP98K
FK6AL QA4AA VR2DA
FM7WT O69U VR3B
FQ6AD OH7TM VS1HC
G3GOG OK1FF VS2DW
GCMDO ON4AY VS5LN
G3DUI KG1AX XE1PJ
GM3GGB OZ2KK XW8AI
GW3LJN PAB8FAB YUNJW
HASKBP PJ5AA YU3FS
HC4A YW64E YV5HL
HCBUX P22W ZC5AL
HE9LAC P91NE ZE1JV
HP110 SM5AQ8 ZK1BS
IN4V SP6BY KH5MQ/ZK1
JAIANG TI2A ZK2AD
JZ8HA UAI1AU ZL1ABZ
J71AW UAI1KB ZL3JA
KR8BJ UG2AB ZM6AS
KC4AF YEBOJ ZE1OU

FACTS ON THE GOTHAM V-80 VERTICAL

- If K6INII 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 wind-storms.
- 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.

73, GOTHAM
AN APPEAL TO INTELLIGENCE

A product that is consistently advertised in QST after 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:

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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!

6-10 TWO BANDER .............. $29.95
10-15 TWO BANDER ........... 34.95
10-20 TWO BANDER ........... 36.95
15-20 TWO BANDER ........... 38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have 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.

6-10-15 $39.95 10-15-20 $49.95

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.

Deluxe 6-Element 9.95 12-El 16.95

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.

Std. 3-El Gamma match 12.95 T match 14.95
Deluxe 3-El Gamma match 21.95 T match 24.95
Std. 4-El Gamma match 16.95 T match 19.95
Deluxe 4-El Gamma match 25.95 T match 28.95

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 mile 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.

Std. 2-El Gamma match 11.95 T match 14.95
Deluxe 2-El Gamma match 18.95 T match 21.95
Std. 3-El Gamma match 16.95 T match 18.95
Deluxe 3-El Gamma match 22.95 T match 25.95
Std. 4-El Gamma match 21.95 T match 24.95
Deluxe 4-El Gamma match 27.95 T match 30.95

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 decibel 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.

□ Beam #8 (6 Meters, 4-El) ....... $38.95
□ Beam #10 (10 Meters, 4-El) . ... 40.95
□ Beam #15 (15 Meters, 3-El) . .... 49.95

15 METER BEAMS

Fifteen meters is the “sleepier” band. Don’t be surprised if you put out a quick, quiet CQ and get a contact halfway around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

□ Std. 2-El Gamma match 19.95 T match 22.95
□ Deluxe 2-El Gamma match 25.95 T match 32.95
□ Std. 3-El Gamma match 26.95 T match 29.95
□ Deluxe 3-El Gamma match 36.95 T match 39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power hams. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

□ Std. 2-El Gamma match 21.95 T match 24.95
□ Deluxe 2-El Gamma match 31.95 T match 34.95
□ Std. 3-El Gamma match 34.95 T match 37.95
□ Deluxe 3-El Gamma match 46.95 T match 49.95

(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.

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The design and production of communications receivers today is considerably different than in past years for two principal reasons. Costs have risen precipitously; to manufacture a receiver in the face of this and keep the price reasonable requires good tooling, long runs, and little allowance for error. Secondly, there are greater demands placed on receiver operation than ever before, versatility... handling ease... yes, amateurs have come to ask for parameters of performance almost unheard of in past years.

RME in announcing the new 6900 states without equivocation that this receiver performance is unmatched by anything near its price class. The 6900 is engineered to give optimum service for all modes of amateur communications — not merely one. Engineered under the supervision of Russ Planck, W9RGH, the 6900 has as many advanced pioneering features as its extraordinary namesake, the world famous RME69, which was the first band-switching communications receiver ever produced — over 20 years ago and still widely used today.

What makes the 6900 so Hot? First, meticulous attention to details so that every circuit is performing in an optimum manner. Second, an ingenious function selector, the Modemaster. Every circuit in the 6900 is designed to provide high selectivity; frequency stability, sensitivity and low internal noise. Finally, inclusion of all function controls necessary for a modern communications receiver... vernier control knob with override clutch for fast tuning; RF gain; AF gain; antenna trimmer; band selector, stand-by/receive/calibrate/transmit; ANL; T-notch filter; calibrate adjustment; band selector.

Whether you operate CW; SSB; or AM, you will have the almost uncanny feeling the 6900 was designed solely for you — this is the test of a modern communications receiver that we believe only ours can meet on the operating desk.

- CONTROLS: 11½" 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 Output.
- Noise Limiter for SSB and CW, AM.
- Separate Detector for Single Sideband.
- 5 Meter Calibrated in 6 db Steps Above S9 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.
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- S-N-R: 10 db at 1 mw Input.
- SELECTIVITY: 500 cps, 6 db down, in CW mode.
offers optimum performance on SSB, AM or CW with no compromises

**NEW...VERSATILE**

Model 6900

MODEMASTER SWITCH

**Gives One Hand Knob Control of 5 Distinct Functions**

**A** When in the indicated AM position, a full-wave diode detector is used. The IF frequency response curve is 3.5 kc wide at 6 db down and, the AVC system is switched for fast attack/fast decay operation. The AM band width for this area is 3.5 kc.

**B** In this AM position all of the conditions described for function A above remain the same except that the 1F response curve is narrowed to 2 kc to reject nearby signals on crowded bands.

**C** In the LSB (Lower Side Band of SSB carrier) position a series of steps occur.

1. The AVC system is switched to a fast attack/slow decay performance.
2. The Beat Frequency Oscillator is turned on and positioned for desired sideband reception.
3. The second conversion oscillator frequency also shifts for reception of desired sideband while the IF response curve remains the same.
4. An advanced Product Detector switches in to replace the Diode Detector in all SSB and CW positions.

**D** In the USB (Upper Side Band) the changes cited in function C above also occur but are designed to accommodate the Upper Side Band.

**E** When switched to the CW position:

1. The band pass of the IF System is reduced to 500 cycles (.5kc)
2. The BFO Injection Control and BFO Pitch Control becomes operational.
3. The AVC system is changed for optimum when operating under CW conditions.
4. The second conversion oscillator is positioned for reception of the upper sideband beat note.

See your RME distributor or write to

RME Electro-Voice®

Dept. 10Q, BUCHANAN, MICH.
Station Activities

(Continued from page 90)

af 0600 Fun, TCVP 2nd call area on 2070 kc. at 1900, IPN on 2890 kc. at 1600. Appointments: W2CTG as ORS, W3PB/2 as OD IV. Endorsements: W2ZIU as EC Ors, W2JPY as ACS, W2ZCA as ACS, W2TFY made BPL for the first time. 2G2TKK's 20-meter ground-plane blew over in the Oct, CD Party, K2UZJ - 200 kc. and is very pleased with the results. WC2OB reports that CD Party activity is peaking up. He has a new HQ-160. K2JXF is going push pull audio rig on his Scout. WP2PH reports that W5EDX has moved to HIB想知道, K2KQC handled 22 messages for the Red Cross during October. K2FOD on 20-meter QRP is our first phone QRP report. W7QDO has 2-meter and 4-meter jammers. The Alfred Radio Club and Orleans County Radio Club are now affiliated with ARRL. Congratulations! W2UIF reports that her brother and his son are now W5VYM and W6VYN. KS6XK has a new Mooney ground-plane antenna. When is the EC4S spring party? K2QPC reports that too few stations on v.h.f. work, consequently V.H.F. QSO Party scores are a lot lower than before. WAEYMV is back on 20-meter e.w.c. The V.H.F. Roundup at Three Rivers Inn was a tremendous success. Over 500 v.h.f. persons attended, The Seraea V.H.F. Club had 140 persons present. W8CQW had 3 DX awards-JIICXQ, WAZ and WPX. The Northern Chautauqua ARC elected K2GDH, pres.; K2KRC, vice-pres.; W2ZBD, secretary; and K2GZM, treasurer. K2GDH announces that classes for FCC licenses will be conducted if there is sufficient interest. W2WJX reports that the Second City ARC is a part of NTS, which meets on 3748 kc. at 1909 on M.-F. All are welcome. The Square Island Smoke Signal is a monthly report. CQ DX Club, west coast, is in Canada. May the New Year bring you happiness and more time for improving your station and operating procedures. W2E2Z 242, K2IP 177, W2FUF 176, K2RTN 104, K2QD 234, K2JRN 121, W2BU 107, W2OJ 106, K2BD 105, K2CQQ 98, K2ZMC 93, K2MK 34, K2KRC 34, K2KRY 34, K2BBJ 32, K2DZQ 32, W2QG 32, W2EBC 29, W2FZ 28, K2KQ 18, W2JY 18, W2KX 18, W2JBE 18, W2JX 18, W2LDL 9, K2UJZ 4, K2JTR 4, W2RC 1. (Sept.) K2UJZ 169, W2ZEB 69, K2KQC 62, W2JQZ 35, K2MEB 10.

WESTERN PENNSYLVANIA—SCM, Anthony J. Morecki, W5JHNR—SEC: ONIA, RMJ; GEC: NUG, KUN and K3UK. It is with deep regret we record the death of C.SL. The WPA Traffic Net meets Mon. through Fri. of each month at 1900 E.S.T. at 1900 E.S.T. New appointments: K2NQ as RMJ; LVG as EC; K3GHH as OURS and OBS. AJN is now W3HPB. The WPA VHF Net meets daily at 1900 E.S.T. and 0700 E.S.T. All are welcome. The Holiday banquet was held at the C.SL hotel and all stations were invited to attend. The annual banquet will be held on Jan. 15th, 1960. All are invited to attend. The WPA Traffic Net is now on 28.8 kc.

SOUTHERN OHIO—SCM, Charles A. Slaughter, W8SBI—SEC: C.O. Post, RMJ: GEC: NUG, NUG. K3QYY received the LARK certificate. K3SAIJ received the HAMMERLORD certificate. W8GZI received the NUG certificate. W8HML received the XM0D certificate. W8KUR received the BPL certificate. W8KUR received the BPL certificate. W8KUR received the BPL certificate. W8KUR received the BPL certificate.
1960's Biggest Value

MSB-1
MOBILE SIDEBAND COMMUNICATOR TRANSCEIVER

MSB-1...far advanced in design...priced for fullest value!

Compact...mounts readily under dash complements any modern car. Its attractive gunmetal housing with black and satin aluminum panel shows equally to advantage on any well-appointed operating desk.

Highly stable...non-critical with single knob VFO tuning both transmitter and receiver...with quartz crystal filter to eliminate unwanted sideband.

Every desirable modern feature...

125 watts P.E.P. input...upper and lower sideband and CW...all band operation, 10 through 80 meters...high stability VFO...VOX...push-to-talk provisions. Receiver sensitivity better than 1 microvolt...9 mc band-pass crystal filter for excellent transmitting and receiving selectivity...100 kc crystal calibrator unit available as an accessory...12V DC power supply is transistorized...

AC supply also available. MSB-1 is only 5"H, 12"W and 12"D, weighs but fifteen pounds less power supply.

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TOM NEGREY, Raytheon field engineer, was on assignment in India when he found it necessary to draw on local methods to solve a universal problem—transportation.

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Working in a remote part of the world often provides challenges that are—to say the least—unique.

While on assignment in India, Tom Negrey solved the problem of transporting new weather radar equipment by employing local animal power. Tom has since returned to the home office and is assigned to important radar projects in this country.

Raytheon field engineering opportunities exist in the United States as well as overseas. You may qualify if you have an EE degree or equivalent practical experience with missiles, fire control, ground and bombing radar, sonar or electronic countermeasures. Benefits include attractive salaries, relocation assistance, insurance and advanced educational programs. Please write R. E. Guittarr for details.

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Coordinators in Louisiana will please address their reports and other correspondence relative to ARWC matters to A. L. Powell, W4ELQ, Secretary, Emergency Coordinator, 224 Hollywood Drive, Metairie, La. Traffic: WSCEZ 653, K4LKC 18, WS6E 8, K4QRR 2.

MISSISSIPPI—Acting SCM, Thomas C. Pete, K4RRY—We in the Delta Division want to congratulate SHRV on his election as our new Director. We also want to congratulate BSR on his election as Vice-Director and praise the work he has done as Associate Director. We pledge our full cooperation to the new Director. The Cleveland ARC put on a demonstration of amateur radio on the streets of Cleveland recently. I think these demonstrations would be well worth the while of all over the State to get the general public acquainted with ham radio. K4VLY in Coralville, is on the air with a Globe King and an HQ-100. We congratulate the members of the Mag. & Gulf Coast H. N. for the splendid job they are doing in handling traffic in and out of Mississippi. VGF is putting up a new Tri-band beam. Traffic: K4QFR 364, SG5 47, HYO 12, MFD 12.

TENNESSEE—SCM, R. W. Ingraham, W4UJO—Thanks to PAH, PX and K4DUIK for net reports and to K4KYL for the OBS reports for enquiring amateurs: K4MYT as OBS for 6-Meters, W4KDI as OBS in Memphis, K4CNY as OBS. The Tennessee C.W. Net now comes under the Eastern Area Net with liaison to 4RN, UVS and DTC. The F4YH is recommending the FT-243 for bugs, K4OUIK is begging for more Tennessee QNIs on TSNR, DFR has designed and built a successful electronic key; Chattanooga OBS in MIDY is modifying a Heath Citizen Band Transceiver for 6 meters; DX activity is reported on the 20-, 15-, 10- and 6-meter bands. 45 are attending our construction course. Traffic: (Oct.) K4CNY 324, W4QGP 209, W4KDI 175, FX 100, K4JQF 19, K4XW 18, K4YI 24, UYO 58, CXT 27, POP 40, K4LBB 27, W4RRY 20, UVL 16, SG1 15, PAH 13, JYFI 11, SJ 10, UVP 6, DFR 5, K4KYL 1 (Sept.) W4FX 81, SG1 15, DFR 12.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4USD—As SCM, SCM: W4, C. Alcock, W4DIS, K4CSF, K4KSH, PAMs; S4Z and K4HCK, S.S.B, PAM; K4MY, W4IF, PAM: K4QOQA Our SEC is now State Radio Officer, BAZ and ABE (Louisville c.d. station, EJQ chief operator) are keeping our section nets busy with c.d. and Red Cross traffic. Daily use of our nets by public officials is far better training for emergencies than a few annual tests. This also informs these officials of our ability. If your complaint has been lack of traffic for your area, try one of these nets and share of this traffic. V.h.f. activity remains high in Kentucky with OBS reports from J47H, DXH, GSH, K4OMY and L4AA, ADE being 200 a month under construction. BFY has a 6- and 2-meter mobile. GSH is working on a 220-Mc. rig. LOA reports 100 per cent copy on all 50-Mc. reports received from ELG, S2L and K4BAB. K4LBB and JYF gave a demonstration of amateur radio to the Newport Optimist Club. YL K4VDD from Glasgow in KY is on K4YN, K4HOE is a big help on 9RN. More stations are needed for 9RN liaison. OBS ELG hopes to transmit ARRL bulletins on 8 and 2 meters soon. Traffic: W4ZDB 202, BAZ 190, K4CSF 161, W4USD 66, S4ZB 81, K4HOE 41, W4CD9 37, K4QH 21, ZML 29, HCK 29, KIS 19, W4WPUQ 17, K4JQF 18, K4KSH 12, K4HHU 12, MFP 11, K4TYP 9, K4LBB 9, W4WVE 7, AOH 5, ELG 5, K4KWE 4, LOA 4, W4SSU 3, K4VDD 3, W4UJO 2, WYU 2.

MICHIGAN—SCM, Ralph P. Threeton, W4EX—SC: YAN, RMS: W4CC, QCC, QOFO and FWQ, PAMs: AQA and NOH (v.h.f.). New SCs are J4XX and U4G. New OBSs are AUD, GKT and IV. SAY is a new OBS. NOA is a new OBS, BF5 is a new OBS. Others who worked in the Women's Air Race (aka AQA, LSS, PCT, QBA, QTO, QPO and K4MPO) are down—again. AQA has suggested that all NCSs on the BH/MEN Net supply FOR OBS appointment. QO reports the St. Lawrence ARC is now equipped for all bands through 6 meters under the club QQQ and has a DX-100, an 8X-100, a Gonset and an Eleven w/1000-watt generator. U4G is on 80 and s.s.b. and suggests an OBS s.s.b. ELW says the Kalamazoo Club now has 20 transceivers for 2 meters. BF5 reports QCC, EAMC and K4QCC agree. K4IDF and K4MZR are all on 220 Mc. BF5 also is NCS for the Sun. 9 p.m. S.W. Mich. 6 Meter Net. (Continued on page 112)
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SHORTWAVE PROPAGATION by Stanley L. Leinwebl
(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 discussed together with the factors of wave radiations. The book then carries the reader into the sky wave, measuring the ionosphere, ionospheric variations, the natural electron and artificial phenomenon. Sky wave propagations are covered, and the preparation of MUF curves are discussed. Of considerable interest to amateurs radio operators #231, $3.90.

HOW TO USE GRID-DIP OSCILLATORS by Rufus F. Turner K6AL. The first book ever devoted entirely to grid-dip oscillators tells you how to construct along with the various possibilities of frequency. Its many applications are useful to service technicians — radio amateurs — laboratory technicians — students studying electronics and experimenters. It is applicable to all kinds of radio receivers and transmitters, as well as to television receivers. The oscillator is a troubleshooting device — an adjusting device — a frequency measuring device — applicable to circuits and components in oscilloscopes — and also as a signal source of variable frequency. Where calculations are involved in the application, sample problems are completely worked out for the reader. 244 pp., $2.65.

Ohio—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, SDAE, SEC: UBP, RM1: DAB and YTP, PAM: HZ3 and W8S, K6W& received his Greater Cincinnati ARC certificate. Wright-Patterson Air Force Base RC officers are JSE, pres.; KKEVE, vice-pres.; and KSE7, secy. Finally had over a thousand subscribers with more amateur E-mailing, HOY joined Silent Keys. KJE is in UK-Land. At the Warren Hamfest 135 amateuras were registered, with K56LA taking home 1st place in Sweepstakes. At the 14th I.T. switch and an SWL the Mosley 'Tribebeam. Your SCM attended the Cleveland Amateuradio Convention, along with Vice-Director D. D. Wright. There were about 1200 present including 500 amateurs, with 214 attending the banquet. K5KRO received awards for his recus work during the floods in the Cleveland Area. The guest speaker was FKC, founder of the Ohio Satellite Tracking Station, who spoke on “The Founding and Development of the Satellite Tracking Station” and played back tape of recordings of signals sent out from various satellites. Twenty-five took the Novice and Technician Class examination. Novice prizes were K5JFT, the Collins 75SI-1 receiver; K6S; IF8 and JH9 each an NC-138C receiver; T2O, a Gilmore Scout Deluxe; K6TV a TNC-32 Tribeam. This hamfest has grown into one of Ohio's largest. The Ohio Phone Net needs a Dayton outlet and many in Northwestern Ohio, so watch your phone bulletin. K5KEF received his General Class license. K5H8 and NXX have a new Apache. The Greene RC saw a film slide and heard a talk in Europe given by 1ZP. K5JGJU is mobile on 10 meters. HUM vaated Columbus, Ohio, Tennessee's Ham Shack, W4JH, to speak K5KES, of Michigan, as it's —Ham on the Monongahela. The Fulton County ARG holds its meetings the 3rd Tue. of each month at the Trumbull County home. K5JBN is mobile mostly on 160 meters. K5KPB received his General Class license, KNNs PTZ and QVW are new Novices, ZHO is a new Apache, MQT recently was married. Columbus ARCA and Tecumseh inform us that they are making the most of the transistors, a school for Novice and Technician Class licenses only will be started the first of next year. New appointments are K6M8W, K6ZQW, K6BTR, K6AS as OCS, K5JQJ as FC and DDQ as OH8. GFE, our very active OHQ, spent eleven weeks in the hospital. Your SCM attended the Northeast Ohio 36-Mc. Group's banquet, which was held at the Swiss Club near Canton on Halloween night. There were 85 seated, 17 of them amateurs. The group had the enjoyment of the company of two visiting YLs, 2TH and 2UCZ. The Greene RC heard I1L speak on antennas and the club's new 2-meter net meets at 1800 EST Thursdays. The Cuyahoga County ARG, at the request of O BigInted Falls Police, has put up patrols using mobiles with ADY, AEU BPE, LHX, LEO, LMM, N1W, B5U, KUG, K6U, SUS, TRO, KS, ASW, EJH, HIP, IUI, LBK, LZL, K5M and MME participating. K5LMU moved back to Indiana. IRB was made a Tops C.W. Club member by LPH. The stork brought a baby girl to TAO and a baby boy to K5JZ. The first official meeting of the newly-organized Maryland 10 held recently. Officers are SRE, pres.; TV, vice-pres.; K5JPP, secy.; 787, treas. Wish all of you a very Happy New Year. Trish 1177R, L2QF 235, ZYU 37H. DA1 238, BXZ 104, K6D8E 31, K5KU 35, DEJ 60, W6CTZ 38, AL 35, IBX 30, ID 23, K5JZJ 35, W5GIR 21, KTT 15, K5JQ 21, W5LC 7, W51C 7, WYS 6, K5KKG 4, W5EOE 3, K5KHEJ 3, W5WE 3, K5KEB 2, GHT 2, EDO 2, WLDR 2, LMB 2, K5BMO 2 (Sept.), K5KFT 3, K5JLE 46, BTD 11, JSH 10, W5GAU 8, K5KHT 3. (Continued on page 114)

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OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, SDAE, SEC: UBP, RM5: DAB and YTP, PAM: HZ3 and W8S, K6W& received his Greater Cincinnati ARC certificate. Wright-Patterson Air Force Base RC officers are JSE, pres.; KKEVE, vice-pres.; and KSE7, secy. Finally had over a thousand subscribers with more amateur E-mailing, HOY joined Silent Keys. KJE is in UK-Land. At the Warren Hamfest 135 amateuras were registered, with K56LA taking home 1st place in Sweepstakes. At the 14th I.T. switch and an SWL the Mosley 'Tribeam. Your SCM attended the Cleveland Amateuradio Convention, along with Vice-Director D. D. Wright. There were about 1200 present including 500 amateurs, with 214 attending the banquet. K5KRO received awards for his recus work during the floods in the Cleveland Area. The guest speaker was FKC, founder of the Ohio Satellite Tracking Station, who spoke on “The Founding and Development of the Satellite Tracking Station” and played back tape of recordings of signals sent out from various satellites. Twenty-five took the Novice and Technician Class examination. Novice prizes were K5JFT, the Collins 75SI-1 receiver; K6S; IF8 and JH9 each an NC-138C receiver; T2O, a Gilmore Scout Deluxe; K6TV a TNC-32 Tribeam. This hamfest has grown into one of Ohio's largest. The Ohio Phone Net needs a Dayton outlet and many in Northwestern Ohio, so watch your phone bulletin. K5KEF received his General Class license. K5H8 and NXX have a new Apache. The Greene RC saw a film slide and heard a talk in Europe given by 1ZP. K5JGJU is mobile on 10 meters. HUM vaated Columbus, Ohio, Tennessee's Ham Shack, W4JH, to speak K5KES, of Michigan, as it's —Ham on the Monongahela. The Fulton County ARG holds its meetings the 3rd Tue. of each month at the Trumbull County home. K5JBN is mobile mostly on 160 meters. K5KPB received his General Class license, KNNs PTZ and QVW are new Novices, ZHO is a new Apache, MQT recently was married. Columbus ARCA and Tecumseh inform us that they are making the most of the transistors, a school for Novice and Technician Class licenses only will be started the first of next year. New appointments are K6M8W, K6ZQW, K6BTR, K6AS as OCS, K5JQJ as FC and DDQ as OH8. GFE, our very active OHQ, spent eleven weeks in the hospital. Your SCM attended the Northeast Ohio 36-Mc. Group's banquet, which was held at the Swiss Club near Canton on Halloween night. There were 85 seated, 17 of them amateurs. The group had the enjoyment of the company of two visiting YLs, 2TH and 2UCZ. The Greene RC heard I1L speak on antennas and the club's new 2-meter net meets at 1800 EST Thursdays. The Cuyahoga County ARG, at the request of O BigInted Falls Police, has put up patrols using mobiles with ADY, AEU BPE, LHX, LEO, LMM, N1W, B5U, KUG, K6U, SUS, TRO, KS, ASW, EJH, HIP, IUI, LBK, LZL, K5M and MME participating. K5LMU moved back to Indiana. IRB was made a Tops C.W. Club member by LPH. The stork brought a baby girl to TAO and a baby boy to K5JZ. The first official meeting of the newly-organized Maryland 10 held recently. Officers are SRE, pres.; TV, vice-pres.; K5JPP, secy.; 787, treas. Wish all of you a very Happy New Year. Trish 1177R, L2QF 235, ZYU 37H. DA1 238, BXZ 104, K6D8E 31, K5KU 35, DEJ 60, W6CTZ 38, AL 35, IBX 30, ID 23, K5JZJ 35, W5GIR 21, KTT 15, K5JQ 21, W5LC 7, W51C 7, WYS 6, K5KKG 4, W5EOE 3, K5KHEJ 3, W5WE 3, K5KEB 2, GHT 2, EDO 2, WLDR 2, LMB 2, K5BMO 2 (Sept.), K5KFT 3, K5JLE 46, BTD 11, JSH 10, W5GAU 8, K5KHT 3. (Continued on page 114)
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Now that 1960 has rolled up on us, I cannot help but reflect how much these friendships have enriched my life during the past year. And yet...

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has a 6-meter waffle-talkie building project. KCEY has worked 14 stations on 144 Mc, with 20 watts. SLD our NC, reports AREC activity for the 1025 REI, which has been quite good in various parts of the State. Traffic: (Oct.) WBDR 2225, LQG 1900, SCA 1744, LNX 124, FGV 1319, KGKX 130, WMT 120, KMKX 109, WSLC 59, GQ 83, KCMN 59, WWXQ 57, KCEY 57, WKGX 43, WDE 38, QVA 37, KGKX 30, JSI 28, WQJE 29, HSTV 28, WMT 21, WDE 12, WFV 12, KMKX 10, OTY 17, WREME 10, KCEA 12, HJC 11, JGM 7, OFK 7, WABD 6, APL 6, KBXK 5, WPIT 5, RFD 5, WHM 4, KGQZ 3, KEEQ 2, RTF 1, WBUD 2, (Sept.) WPTL 6.

KANSAS—IOM, Raymond E. Baker, WDFN—SEZ, 1ER, AAT, SEC, 1POW, BBG, CAC, PAM, JAC, V.H.P, PAM; JAI. The KVBC at Topeka has started code classes, KJTVW is handling traffic for students at KU. LDX 4,500 has a new Apache and again is active in 6-meter traffic. The Lawrence, El Dorado and Wichita clubs again assisted with Goblin Watch for which the City Officials expressed their appreciation. The S.E.T. was covered very well in Kansas and we have reports in from the following participants: Zone 12, LNZ 31 stations; Zone 11, JZ 18 stations; Zone 10, KJTW 6 stations; Zone 9, ONF; Zone 8, GIG; Zone 7, TTG, ONI, AAT, EC Zone 11, reports a fire drill was held at the El Dorado Refinery with mobile units ONI, BWB and BVP furnishing communications with fixed stations KTG and TSR, and directing traffic away from burning oil. With the work of KJTVW through the Lawrence Club we had the pleasure of having a very nice meeting with the club, AREC-C.D. and other matters were threshed out. While KCEY was not a Kansas boy he is our next-door neighbor. Missouri works our nets, so we wish him the best of luck in his new job as manager of the Tenth Region Net and our cooperation is promised. In a QNC to the net recently we gave them PICON, then had to explain. We should all know and practice it. Traffic: WQJLI 570, BML 453, FNS 239, KBKX 210, WBEJ 15, GQJ 145, SYVZ 75, KZMA 74, HGC 70, WABJ 66, TOL 61, IFR 59, KBGD 58, BFX 57, WDRZ 57, SAP 26, JGM 22, KZKE 17, WABSO 17, KMKX 13, JG 11, WDEJ 10, STC 9, KBQB 7, SIQ 7, LHF 6, WDE 6, WBSSB 5, KBEI 4, QWN 5, TNW 5, LPS 2.

MISSOURI—SCM, C. O. Gosh, W8HIU—Net reports (Sept.) MNB (AM) 27 stations, QNI 42, QTC 18, NCS OUD 12, KJFB 1; MNB (PM) 17 stations, QNI 139, QTC 144, NCS OUD 7, KJFB 1, KQJKQ 3, KQSQ 2, GEP 1, KBOC 1, KJQK 1; SIQ 3; QNI 7, QTC 12, NCS OUD. (Oct.) MNB (AM) 27 stations, QNI 139, QTC 148, NCS OUD, QNI 170, NCS OUD, KQJO 2, RTW 1, ARO, GEP, KBEI, KQSD, PPF 2, KBOC 1, SIQ, QTC 25, QNI 11, NCS OUD. (Nov.) MEN 13 stations, QNI 148, QTC 100, KJFB 2, KQJKQ 2, VQI 2, the following have been appointed by OMIM (net mgr.) for MEN: NCS VPQ, OYV, OHC: ANCS KKLW, EEC, KBQXL. A full list of nets and stations is thus available for this net. The section was more active during the S.E.T. than it has been for several years. All nets were activated, several local and out-of-state stations were carried out and the major portion of reports and Headquarters traffic was cleared via KBJLTP/B (SIBC). Congratulations, fellows. KQJOQ reports a total of 270 points in the October CD Party. KJHHY has a new rig: a pair of 4-LEEs driven by an AF-07. WAP reports a nightly sked with JU8 on 147.1 Mc. GEP reports that Bathdopper RC now is incorporated. KDREW still is off the air because of lighting damage to his rig. KJHPL is QRL with a new traveling job. KLRLX/8 is on QRL with school work. JU8 reports 50 stations reporting into 29.3, 25.5 and 147.3 Mc. in the St. Louis area. RACES nets were active. There were many qsls and reports and many new appointments: KQSQ as OPS, KEDW as OES, Endorsements: KSHK as EC, ORF and KJHHY as ORS, OUD, and TAF as ORS. KSPJ 1400, WBMMW 202, KRX 194, KSCG 158, LDER 138, LQF 137, WOBIZ 97, KQJOQ 94, WBAJC 80, OYV 53, BVY 49, VQF 44, KRX 39, WBTW 29, HLF 27, ZDR 34, ABO 23, KJHHY 14, LGZ 12, OEP 12, WABWAP 8, GBG 8, GEP 5, PXE 6, KLRLX 4, OJC 2, WQMRK 2. (Sept.) WBTW 20, KA 2.

NEBRASKA—SCM, Charles E. McNeel, W6XEP—The Western Nebraska Net, on 3580 kc, daily at 0700 MST, has started weather reports on net roll call out. We have increased interest and traffic, making this month’s report QNI 846, QTC 389. The Nebraska Section C.W. Net operates on 3585 kc, daily at 1900 MST, reports QNI 210, QTC 111. The 75-Meter Morning Phone Net, on 3880 kc, daily had QNI 740, QTC 130, reports KEDGW. RDN has a new appraiser on the air, YYV has moved from Sutherland to No. Platte and will be operating.

(Continued on page 120)
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A Self-contained 1 KW Transmitter-Receiver
A True Table-top Station with NO Sacrifice of Performance

SPECIFICATIONS

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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
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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.
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Atting all bands on s.s.b. with the 8-Line, EQX was awarded a Colorado Net certificate for participation in the Weather Net while in Colorado last summer. The Western Nebraska, Eastern Colorado, and Northwest Kansas s.s.b. boys attended a meeting in Phillipsburg, Kan. The report for the C.W. Net for September, which resulted in too little for publication in the month's issue is: QNI 136, QTC 87. Traffic: W4NKR 330, NYU 258, RDN 117, KBK 106, DGW 84, BDF 78, CDG 271, W1ZJF 6, W2AUR 24, WW2G 45, K3BLP 41, SFY 45, W1WQ 20, K0KTA 25, WBAO 24, KOW 22, W2ELL 9, LXS 21, W0FQ 11, W2VY 16, W1VZ 16, K8EBR 12, WHITA 11, K2HTZ 11, W1EFO 10, UY 10, A0G 8, K9MS 8, UH6K 8, W1 WWE 8, OCU 7, OY 6, K6PBH 6, W2BFO 4, K7HBP 3, W19O 2, SPK 2, SWG 2, QEK 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ: SEC: ECMY, WM: PAM: VBL: V.H.F.: FM: TFT: Traffic nets: OCN, Mon.—Sat, 1800, Sun, 1800 on 5880 kc; CN daily 1150 and 2200 on 3540 kc; CVN, Mon., Wed., and Fri, 2300-1459; CN, Sun. 0900 on 2810 kc; AW, BDI, KCH, NIMY, YD and YM make 4PL. KURS is chasing DX with a 3-board vertical. KAJL has set up a station in Wilton after 3 years in New York. KXQ reports the 4N handled 672 messages, including 517 on the second session, during 31 sessions, with average attendance on 217.7. KCT, RFA, RFJ and KIFH, IOW. KU7 has a new Ranger. K1DPL has a new Apache, K1NJMA is a new Novice in Cheshire. QVIP is active on the 20 meter and KFYG has a 120 meter beam for 220 Mc. FNE is active using c.w. and s.s.b. on 10 meters. DCM is EXing on 20 meters. K1ZM is active on 20 meters. K1KDF is a new Novice. K1KPL is on a 900 meter linear. K1GKHE added a Heath 8880 adapter to his DX-100, FYF is attending college in Eau Claire, III. ZTV is building a 4-003A linear. K2CUF reports that the EN handled 429 messages during 31 sessions with an average daily attendance of 29 stations. High QNI were DAV, K2GIC, K2HFR, YPMK, W2RO, W3AE, W1R, W2M, W2LW, W2LW, W2J, W3CBQ, 25, EVH is on 80, with 100 milliwatts PEP. At its annual banquet Oct. 22, the Southern New Hampshire ARS selected SHF4C, N8Y2L, vice-president, and K1SC, trans.; K1SC, exec.; K1SC, trans.; GYV, executive board. SBM hopes to be on 2 meters from his apartment soon. K1NMBF has a new Globe Scout 8908. K1RQV has a new 2-meter beam. K1IRM has a new 40-meter beam. CXG has finished his Mojave receiver. IOB has a 20-A and a new HQ-170 receiver. Z2K is building a 60-hertz linear. K1ICB has added a Heath 6880-10 to his Apache. ZTQ is having transmitter trouble. The Manchester Radio Club no longer requires a code test at 7 P.M. each Tue at QO headquarters. VVH renewed his EC appointment. VW renewed his RE and OP appointments. GPM is with the United States Navy. K2CWF is using a Valiant and a 75-A-4. Reports received: OSS from PYY and LQG; OM from KIFH, KFWF, CMM, VMX and VVY; SN from K1B, KCH, K1NIM, KQY, KOB, BDI, 334, EFW, 294, K1M, K2HBI, W1YU, K1AES, 101, W1TYQ, EFW, 294, K1B, K1KQ, W2QV, TUW 8, CPH, K7DQ, K1Q, W1BES, 5, K1M, 4, WPH, 2, JAA, 1, YH, 1.

MAINE—SCM, Jeffrey I. Weinstein, W1WJK: SEC: JMN, PAM: BXC, RMP: EFFR. The Sea Gull Net meets Mon., through Thurs. at 1700 and 2200 on 3540 kc. The Net Team meets Mon. through Fri. at 1900 on 3550 kc. JMN Bulletin schedule: Mon., through Thurs., at 2000 on 3600 kc. New applicants are running code on Tues. at 7 P.M. Each Tues. at 2000 on 3550 kc. The Net Team meets Mon., through Fri. at 1900 on 3550 kc. JMN Bulletin schedule: Mon., through Thurs., at 2000 on 3600 kc. New applicants are running code on Tues. at 7 P.M. Each Tues. at 2000 on 3550 kc. The Net Team meets Mon., through Thurs. at 1700.

The PTN is recruiting new members for c.w. traffic work. K1KQD has a new 800-ohm LFQ, K1QKZ is operating from his new QTH in So. Portland. Our ACM is planning a statewide meeting for all official committee. Keep watching for station announcements. Station appointments are available to all qualified candidates. Write your SCM for more information. Does your county need a station? Please let us know. We are preparing a list of stations. K1NYM is a new Novice in Portland. Here's wishing all of you Happy Operating and Best of Luck.
TELREX

CHALLENGER "TRI-BAND"®

Single-Transmission-Line Array

Model TBS-416 $159.50

F.O.B. Asbury Park, N.J.

Telspec Model TBS-416—tuned, matched and calibrated for easy assembly (to your favorite band sectors) and Telspec specified performance at your site—without tuning or adjustments of any kind, required, or recommended! Model TBS-416 consists of 4 medium spaced elements (two of which are "Tri-Band"® elements) on a 16 ft. boom, providing optimum 3 element 10, 15 and 20 MTR performance.

Model TBS-416 is engineered to provide maximum performance and satisfaction per dollar, per element!

SPEdIFICATIONS

V/S/W/R at resonant point
(using 50 ohm coax)........1.2/1
Bandwidth within 2/1 V/S/W/R....1.5%
F/B ratio on 10, 15 and 20 meters 26DB
Max. power rating........1.2 KW 100% AM
Boom length and diameter
16 ft. x 2" O.D.
Longest element length
Approx. 30 ft.
Turning radius approx... 17 ft.

Support mast required 2" O.D.
Seamless .125 wall min.
Wind surface area..............................................5-29 sq. ft.
Wind load at 100 m. p.h. 104 lbs.
Recommended rotator—Telspec Model 175 RIS
Design wind load rating with ½" radial ice load........85 m.p.h.
Antenna net wt. 44 lbs.—Shipping wt. approx. 58 lbs.
Shipping container size approx...........11" x 6" x 10".

The following Single-Transmission-Line “Tri-Bands” available:

CHALLENGER TBS-308 ........................................... $ 99.75
3 Elements (8' x 2" O.D., Boom) gain 5 db.
Recommended Rotator—Telspec 175 ......................... 198.50

MONARCH TBS-626 ........................................... 259.75
6 Elements (20' x 3" O.D., Boom) gain 10 db.
Recommended Rotator—Telspec 500 .......................... 435.00

CHALLENGER DTB-30 ........................................... 38.50
Rotatable 10, 15, and 20 Meter “Tri-Band” Dipole, unity gain bidirectional pattern. Any good TV rotator may be used or Telspec 175-RIS rotator.

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P.S. Don't forget that additional licensed amateurs residing in the same household with a full member may join the League for only $1—without having to obtain a subscription to QST.

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Canal Street & Beaver Dam Road, Bristol, Penna.
daily except Sunday; MPN on 3870 kc, at 7 A.M. daily. Upper new KM DFW. WMN ready in going to tavern. Net attendance: DFW 24, BNP and ZPB 15, KLYV 12, KGXC and KILLB 13, BKG 10, TAY 9, DZ 7, MING 3, LNR, OSK 2, KIJJ and KIJA 1. KLYV is a new ORS. PAM DXS reports that MG1S, working with 23 messages, moved one session for a rate of 388-exceed- for a 25-meter phone net! MUN, BKG, RLO and KGXC did fine jobs in the September Frequency Miss-Testing Test. During the S.E.T. DXS operated mobile as 6-meter NCS at the Worcester Airport and made 10 contacts, DGA is running 100 watts on 6 meters, KGXC is turning into a 100 per cent traffic man. KGXCY, on 90 meters with 25 watts, contacted England on Oct. 30. Former SCM, HRV, is now 190 per cent 10-meter mobile with a 70-watt home-bult rig. BNP added an outside antenna to his HQ-170 with about 400 per cent improve- in signal strength. OWH has a new Hornet beam. LKQ attended the V.H.F. Roundup at Syracuse. KIJKK has a new ground-plan rig for 29 meters. ACP has a new Gooch Communicator III. Office and Field ARC are UKD, pres.; FOX, 2nd vice-pres.; KIACO, 1st vice-pres.; KIOP; secy.-treas.; WMN had perfect attendance during October. The First Regional Net, Season's Greetings. Traffic: WIBV 129, ZPB 120, DLY 75, BLY 68, DXS 56, KILY 37, WIAQ 34, KGXC 28, WTVN 18, SPF 4.

NEW HAMPSHIRE—SCM Robert H. Wright, WIRVM—Hi, KIHC, PAM: WHTF, HIQ, PAM: TA: The Granite State Phone Net meets Mon., Sat. at 900 and on Sun., at 0900 on 3432 kc. The NHN (c.w.) Net meets daily at 1530 and 1730 c.w. The N.H. Sunday News, FPA, of Salem, operated from St. Pierre and Miquelon Islands as FP8HR is several days during October. Bill made abundant contacts and worked 45 countries on s.s.o. and c.w. KIJJY is now General Class; I would like to see a few more of you fellows qualify as Class I OCs. Also the OES appointees would be welcome. Anyone interested in these or other appointments, drop me a line. Renewal—MTX as O9 and ORS pur- to net. Traffic: (Oct.) KIHC 369, FDP 972, HK 101, WZQ 70, TA 66, KICF 27, CSJ 21, WIBH 8, KIIM 7, WIAJ 6, (Sept. KICF 57.

RHODE ISLAND—SCM, John F. Johnson, KI1AY—KBIB is a new OHS. VBR has been appointed alternate net control station of its rebus net. MZC reports working W2- and W3-Land with 45 watts on 6 meters. 5 x 9 reports. HN held 22 sessions, total traffic 143, total QSO 116, high QTH TON, with a per- fect record. KBIZE, who spoke a strong signal on 10 meters, has a new tower and beam to give him an ad- jacent. BPL certificates were issued to SHU for July (088), Aug. (587), Sept. (707) and Oct. (1012) to and KILS to (Sept. (585), TML has installed a 6NC in his B & W 5100. He tells us that the Newport County Radio Club issues a beautiful certificate to those entering ten number stations. As your new SCM I hope to meet sev- eral of you in the future. Tripa are planned several clubs and organizational meetings are to be held. Traffic: WISNU 103, KILS 839, WTVX 145, RKB 33, WIWBR 33, YRC 16, KIAY 16. (Sept. WISNU 770, KILS 688, WTVX 7, BVR 24, KIBBK 18, WJN 10, WED 6.

NORTHWESTERN DIVISION

ALASKA—Acting SCM, Kenneth E. Koehler, KFZBOJ—His and his XYL just got back from the South 48. AAM plans a trip to Europe and Contin- ental U.S. on the way back, P6 and his XYL YG and BIB have had a hard time with code and theory classes at the home of P6 and YG. 2-meter c.w. has been doing along fine, the Parka Club held its annual Progressive Dinner. It was a big success, at 300 attendance. There has been quite a bit of activity on 10 meters recently. I would like news from the outlying area for this column. We hear KZ has a new HT-23. The visit of W1LDCP and his XYL W1LDEJ, CYG and his XYL and KNSKVKW from Fairbanks brought news that AEQ, K16Q, DEJ, OFC and CEN are on 4 meters in thatifty and DEX and DEX are just about to make it using 522a. Traffic: K1GD 421.

IDAHO—SCM, Mrs. Helen M. Maillot, WTTGGY—Reports from E.C.'s show AKEC activity in Boundary, Nez Perce, and Shoshone Counties during the S.E.T. QSO and 10 foot antenna has a 25-meter phone net. Ten hoise hams on 2 meters, with CRE and ZBO as net controls, worked with the Idaho Police on Hal- lowen patrol. The new net on set on 3970 kc. (Continued on page 126)
10db GAIN
BASE STATION TO VEHICLE
-in both directions

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Base Station Antenna

The STATIONMASTER consists of a number of collinear radiating elements fed inphase and encapsulated in a continuous weatherproof fiberglass housing and withstands winds in excess of 125 m.p.h.

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Collinear Gain Antenna

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Nominal input impedance .............. 50 ohms
VSWR .................................. 1.5:1
Bandwidth .......................... ±0.5%
Max. power input .............. 150 watts
Omnidirectional gain .............. 5.8 db
Internal feedline ................. RG-8A/U
Frequency range ............ 450-470 mc

Nominal input impedance .............. 50 ohms
VSWR .................................. 1.5:1
Bandwidth .......................... ±1.0%
Max. power input .............. 75 watts
Omnidirectional gain .............. 4.2 db
Feedline ........................... 10' of RG-58/U
Frequency range ............ 450-470 mc

INCREASE YOUR RANGE BY 30%
YOUR COVERAGE AREA BY 75%

-with these advanced design antennas

Communication Products Company, Inc.
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Percentages listed are measured values
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Special 40 & 80 meter bumper mount antennas in 8' lengths — $21.

*marked for intermediate frequencies.

Amateur net

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128

AREC frequency. The Northwest Chapter of the QCWA has a movement on foot for an auxiliary and now boasts 221 members. QVW operates the Weather Net on 5000 kc. at 0600 daily. The Washington Amateur Radio Traffic Net had 27 sessions with 223 checks and 239 pieces of traffic for October. A new traffic net on 3290 kc. at 1700 PST is called the Evergreen State Net. QFM left on a trip to Arizona for the United Nations. Traffic: W7BA 1773, QLH 758, LDX 566, HUT 314, APS 140, DPLW 135, AMQ 96, KATAD 31, WQKE 69, AHV 64, EJU 27, USO 13, EKT 22, KGON 19, AJT 74, CWQ 14, WTLFA 14, OIV 1, AIB 5, UWT 3, KZAY 4, WTENW 2, RGL 2.

PACIFIC DIVISION

HAWAII—SCM, Samuel H. Lewbel, KH6AED—In a recent report of KWB we omitted KH6QG/KW6Q, the XYL of KW6SO. Sorry, Mary, Mary is active in contests. KH6ARL is back from a trip to Russia where he had an hour-long eyewall QSO with a UAL. He says that TFI is in the number one traffic the Russians are up against. Back on Kauai, NU is teaching a class of 35 future Novices. Report from Guam via KG6AHI—KG6AHI is on with a DX-49 and a 44Y vertical. KG6AIV has a Globex Scout 65, an SX-100 and a 15-meter folded dipole. WBOIQ is on with an HT-32, KW6CE/KC6 is active with an HT-32 and a Thunderbolt, KG6AIF will take traffic, and both KG6NA and KG6NB will be retouched. Watch for announcement of the new “All Guam Contest.” The Hawaii Mobile Amateur Radio Club has revived the hidden transmitter hunts. Traffic: KH6AFL 39.

NEVADA—SCM, Charles A. Rhines, W7YIU—The NARA handled communications for the Carson City Adoption Day Celebration and for the Pyramid Lake Regatta. The Boulder City AREC, under EC HJ, did a very fine job during the recent S.E.T. Thirteen AREC members participated with a final score of 123 points. MAIF reports the recent meteor shower gave poor results on 6 and 2 meters in the Reno Area. The son of LAF is missing his epp on 2 meters for the past week. JCY is back in Battle, KYR is back from Alaska. KG4G has taken up flyfishing. CXQ returned from the Navy and is a new member of Boulder City AREC. KG4V received the WJZKX award. FLU and KGCM visited St. Mary’s Hospital last week. KG4W is getting on 6 meters. QGOL and CGM have a new mobile. KN7K, JYU and JUW are new Reno hams, along with ex-KW6SOL, now KNTJUN. The Nevada Net has abandoned operations because of lack of support. Traffic: W7ZC 43.

SANTA CLARA VALLEY—SCM, W. Conley Smith, KQDYN—The Monterey Bay EC auction was a huge success. W6SPY presented a program on commercial broadcasting at the SCARS. Thanks to W6DFE, W6IGR and WABEIC for the extensive lists and reports. W7IML has installed a TCS receiver for stand-by, also an autometer salvaged from an Abadan indica. W6TLO gave his daughter, Margaret, in marriage to Burton VonDyke on Oct. 21. Lucie has seen the lovely bride were KQ5EG, W6KFO, K6QKI, W6STI and KQDYN. W6CBE keeps in contact with other Stanford Research first hams on foreign projects. K6CIC is moving to a new QTH with more antenna space. W6LIB and W6CLT are building heterodyne exciter for 6 meters. CLT also is assembling a receiver. W6TFF has a new linear and v.f.o. on 2 meters. K6HCQ is going n.e.b. on 6 meters. W6FON is removing transmitter parts. K6GID is working on electronic, transistor, kerry. K6ZCR reports an enjoyable Halloween party with the BAYLARCS. W6BMP is back in new equipment school for KCA. W6OFIP is back in business with new antennas. K6QCI has a new tower and 20-meter beam, W6QNX and K6TEH both have an SK-10. W6ASH has gone warning on now bands. In the C.W., CD Party KQDYN worked K6LSQ locally at the key at W6JLR. Kurt had hitch-hiked to Headquarters for the week end from school in Maryland. W6VIN/5, also contacted in the CD Party, promises to visit us from Oklahoma. The new EC for Santa Cruz is W6NOE. Traffic: (Oct.) W6TDC 306, W6PLG 273, K6ZCR 256, KQDYN 177, W6AIQ 129, K6GID 123, W6YNK 123, W6NC 72, W6ID 84, W6YH 21, K6VQK 15, W6BMP 15, W6OI 14, K6KQG 10, W6CLT 8, W6HFP 8, K6QCI 9 and W6FON 7. (Sept.) W6YNK 36, W6AWC 27, W6JLR 27, K6KQG 7.

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100 N. Western Ave., Chicago 80, Ill.
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<th>SEC: K9KVR, RM: W6CMA, PAM: W4ESS and W5PIV, Happy New Year to all! At the time I am writing this W6GDU and K6HED are temporarily but completely out of the air. We have just moved into a new home. Hope to be back on the air by the time you read this but at present have work up to my ears (fence, lawns, tower, etc.). Please note the text changes on page 60. Sacramento Valley is losing its best 50 to East Bay-W6WLI has been transferred to Berkeley. W6QNI now is on 3 meters, W6AP was hospitalized with pneumonia in October and November but is doing fine now, K6SXX completed WAC and needs only Alpena Co. for WACC. K0RJ has a new Heath mobile generator, Sakaimoto C.T. V.D. for local nets. A new NC-403 and a Vantall, W6JDN was portable in Trinity Co., while working there. There are several new General Class tickets in the northern part of the state. That is it for this time. No doubt some reports have been delayed because there had to be forwarded to my new address. Best wishes to all in the New Year. Traffic: K6SXX 145, W6QNI 14.</th>
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<td>SAN JOAQUIN VALLEY—SCM, Ralph Stanyan, W6JPU—I would like to take this opportunity and time to wish each and everyone of you a very Happy New Year. W6GCH has moved to Monterey, WARE is converting 6-meter gear, K6GQX worked K6CFT for his 50th state on 6 meters. K6GZL has a Hornet tri-band beam. K6BOU made 120 contacts during the CD Party. W6BPSF got his General Class license and is on 40-meter c.w. with his sights set on v.h.f. W6LOD has the only HHO-69 with a dual diversity tuning capacitor, W6PSQ is heard on 75-meter s.s.b., K6LZK is on 40-meter s.s.b., with a 20A, W6JKU has a better understanding of his I-775A. W6VWJ operated portable on Black Mountain during the summer with 10 watts on 75 meters. The Fresno 2-meter repeater is on the air in Fresno. W6GQX is looking for 6-meter operators, W6AP got his tower and beams during a windstorm. K6AYL is rebuilding, W6WLR is taking up flying. W6RRN is on 220 A.f.c. K6HGL is using an abandoned telephone line 5 miles long for an antenna. W6UWV is still inventing perpetual motion. W6KGO is in Alaska. K6LW is having modulation troubles. K6QAV got his General Class license. The Fresno Radio Club handled traffic from the County Fair to all parts of California. The MARSFEST was held June 24, with 150 in attendance. Traffic: K6GT 188, W6TO/8 124, K6BOU 69, W6ARE 20, K6CZQ 2.</td>
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<td>ROANOKE DIVISION</td>
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<td>NORTH CAROLINA—SCM, B. Riley Fowler, W4RHI—SEC: HUL, PAM: DRC, V.H.F. PAM: ACY. We need a Route Manager. K4YEP has been appointed EOC of AFT and K4DYE report work activities in Districts 7A and 8A. District 8A reports a need for a second frequency for drills. Districts 9C and 10A are now operating on 5 meters. Twelve of the fourteen EOCs report nets this month. The following members of the 6-Meter Net received net certificates: KILYV, KIRDY, K4YEP, K4YTC, K4MP, K4VU, K4KGM and K4GMF. Net secretary K4SFN reports good attendance each session, but failed to mention the frequency. The SCM has long been an advocate of v.h.f. for local nets and now reports the traffic report from K4VUG indicates that 6 meters is a good medium for a State net. Area &quot;F&quot; of the North Carolina RACES program is installing 20-meter nets as an area net. Preliminary tests show that it works very well, at least, we are free of kw. interferences. Cliff Blazzock is working on combining many RACES plans in most areas and surely has the endorsement of the SCM. Hear-all reports for the North Carolina S.S.B. Net on 2865 kc. indicates rapid growth. Checking the calls of the net members indicates that the net has members outside the state. This is excellent! glad to hear a net with liaison stations listed on the net roll. I assume that these stations have the same privileges as members within the State. 3, 4 and 8m nets report that North Carolina was present at 20 per cent of the net meetings. Not so good, fellows.</td>
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<td>SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—PAM: K4HRE, RAI: K4AVU, BU: K4PJE, K4BFL got the big prize at the Annual Rock Hill Hamfest held at Jordan Park Oct. 12. The Hamfest was well attended and short talks were given by Director M.W. and Vice-Director A.C. Awards of new 50 watt fizes were made and QSOs to outstanding stations on the nets during Hurricane Grace. A.C. and K4AVU attended the Roanoake Division Convention. The DX ARC of Camden has an excellent disaster plan. The ARC has published 2 Scarab, K4FBG is now at KGAA looking for South Carolina contacts. An organizational meeting (Continued on page 134)</td>
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<th>If you want to learn the CODE</th>
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TO SAVE, OR NOT TO SAVE
(A soliloquy in Three Acts, with a happy ending.)

Cast: A hapless Ham, who has just decided to get more fun out of life by acquiring some better equipment in his shack.

Act I
(Our hero is in his shack. He has called 'CQ' seventeen times, and is listening to the other fellows working the DX.)

"To save, or not to save. That is the question. Whether it is safer to stick to new equipment, or wiser to get some better used gear for a lot less money..."

"Come to think of it, every rig on the air is a used one! And, if I could be sure of getting a really good one, there's no reason why I can't have a bigger one, save a lot of shekels, and still have the same performance and results of a brand new job..."

"Aye, there's the rub! How can I be sure of getting a good one? Mustn't buy a pig-in-a-poke!"

"Pig-in-a-poke? That's what Bill Harrison has been saying in his ads about his used equipment! All my friends tell me that Harrison Radio is the most reliable, and stands behind everything it sells. That's the main reason I always try to buy a good one from Harrison Headquarters, USA..."

"No point in taking a chance. I'll get in touch with Harrison right away."

(Curtain)

Act II
(The world-famous Harrison Trade-In Center. Our hero is riotously inspecting the rows upon rows of shelves strewn with the great array of ham gear ever displayed under one roof.)

"Wow! Never saw so much ham gear in my life!"

"There's several of the very model I want! Every piece has a green tag on it... shows Service Lab verification of performance... certainly no 'Pig-in-a-poke' here! Just look at the prices on those tags... Never thought they could be so low..."

"No wonder they do such a brisk business in the Harrison Trade-In Center... there's such a wide assortment to choose from... and most of those trade-ins can hardly be told from new! Here's their Clearance Section, where any unit which does not pass their high performance standards is tossed back at a give-away price and sold 'as-is'...

"All the boys are so friendly and helpful... they'll fire up the rig I select, and let me judge my satisfaction that it is perfect before I take it home...

"There's certainly no risk here...

"Everything is conditionally guaranteed... if anything should go wrong, their advanced service lab will competently fix it without any charge for parts or labor during the first ninety days... And, if for any reason I am not entirely delighted with my purchase, I can return it at any time up to three months later and get a brand new one of the same or any other model for only the difference in price.

"They really gave me a swell allowance for my old stuff... the swap out a lot less than anywhere else!... And if you want a Ham like mine, he's sure to get the balance over many months... Their low carrying cost lets me enjoy it now, pay later.

"Those new roads make it a snap to drive to this convenient, central location only 12 blocks straight downtown from the Holland Tunnel... plenty of parking, too."

"It's sure great to deal with Harrison!"

(Curtain)

Alternate Act II
(For the ham who cannot visit "Ham Headquarters, USA" so trades by mail.)

(Telephone: A few days later.)

"Here's Harrison's speedy reply by return mail!... He gives me a choice of the model I asked for, but the price is a real good one... More important to me, it's the values that are guaranteed to be unequalled...

"He says he can enjoy all the advantages of those hams which come in to the Harrison Trade-In Center... they'll fire up the rig you order and check it out before carefully packing and safely shipping it to me..."

"I have the same privileges of returning it, even for full cash refund within 15 days... He offers a really top/service for my old gear... and I can take up to 24 months on the balance.

No question about it... for the best deal, every time... my order goes to Harrison!"

(With look of well justified happy anticipation, he seals envelope.)

(Curtain)

Act III
(Back in the shack, a few days later)

"Please stand by, VQ1SSB. I have 9M2OB on the hook, and he says X22AD has been calling me..."

"This is certainly FB gear I got from the Harrison Trade-In Center... and their boys gave me some good dope on how to get the best out of it... Never heard of values to equal this..."

"The money I saved let me make the little YF happy with a new mink coat.

Golly, we both are glad I always deal with Harrison!"

(Curtain, sustained applause)

Epilogue

Honestly, ON, I can't promise you'll make DXCC right away, just because you get your gear from me. At least, not in the first few days. What I do tell you sincerely that whether you want to save with safety on your like-new equipment, or you want the very latest new production, you'll always get more real value for your money and you'll always feel more comfortable at "Ham Headquarters, USA".

Come on in, and bring your old gear. I guarantee you'll return home happy with your trade. Or, drop me a line telling me what you want, what you have to swap and the terms you would like.

TNX 73

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GA 1-6158 Providence, R.I.

of amateurs in the Poolee Area will be held in Florence, K4AQB is EC for Monica Corner. The smooth functioning and cooperation of the state and area nets as demonstrated in Hurricane Gracie again was shown in the October S.E.T., with many new members participating and taking an active interest. Formal truille as to all nets is greatly increasing much to the satisfaction of all net managers. TRUILL (Oct.) W4AEC 658, K4CAM 293, AVU 284, HJH 214, BVX 216, FIE 215, W4CW 214, W4FPH 109, K4GDX 115, K4GUE 115, KYJ 115, W4CY 83, BLF 54, W4CJH 45, PED 45, GGY 42, ZAP 42, HUMBBN 13, HJZ 12, W4W 12, K4DFX 8, W4YOS 3, TCL 2, (Sept.) K4HIK 15, HDX 12.

VIRGINIA—SOM—John Carl Morgen, W4KX—An emergency session of the VFN the Oct. 31 week and assisted CAP and local authorities when a Boswell Airline crashed in Central Virginia, VFN Mgr. BGP reports there was perfect cooperation and all nets handled the situation. VFN had a Hallowe'en party which turned out to be a surprise party for outgoing VFN Mgr. OOL, K4QES succeeds OOL as VFN Mgr., taking on a net and active operation, thanks to Pete ATQ. K4QES has a new station, the V4WJY, reports the QSL to Ft. Monroe, N.Y. K4DJW reports from M.T.N., where he expects to be on SALX. K4QIE is working the Washington Area Traffic Net on 5 meters. The new White Oak Alt. V.H.F. Society (KW3D) is completing a new club house and has an O.S.S appointment, PVA reports several good transmitter hunts were held in the Arlington area as an All-Ec activity. Attention is called to the newly-instated 2200 EST session of V4/AISN, Speed will be kept with as few reasons as possible. A 2200 session was used a number of years back but were washed out during persistent short-skip conditions during the last sun-spot peak. The plan is to keep the sessions as short as possible, 15 minutes if possible, and encourage a get-together rag chug immediately to the interest of those interested. All are invited. The more the merrier. (Oct.) K4QES 873, QIX 780, W4QD 217, K4ADD 107, N4GI 109, W4HCH 107, LVI 104, K4KZ 103, K4CRC 102. K4WJH 101, W4RJ 100, W4USH 100, K4VVY 100, W4QD 100. K4DTC 100, W4HSH 100. K4DJW 100, W4QD 100, K4KZ 100. W4HSH 100, K4DTC 100, W4QD 100. K4DJW 100, W4HSH 100.

WEST VIRGINIA—SOM—Donald B. Morris, W4RAF—SEC: HZM, PAO: K4BTH, K4RAS: HBK, H4B, and PBO. W4YN (C.R.) 5775. Phone Net. 3500 kc. Officers of the East River ARC: HZM, PAO: K4BTH, K4RAS, HBK, H4B, PBO: W4YN (C.R.) 5775. Vice-prcs.: K4REH, K4J4H, Secs.: K4KYE, K4KSY, Treas.: K4GQF, R46S General Club and operates 420 kc. 4200 kc. K4S. K4KSY is going to W.V. K4KSYQ is a new member at Rupert. The Logan ARC's officers are K4HMC, prcs.: K4KMW, vice-prcs.: K4KMG, sec., K4GQF, K4KSYQ, treas., K4GQF. The Tri-State ARC at Huntington has club radio in operation. SET received WACWV No. 17. The Northern Panhandle ARC at Wheeling meets on 50 kc. Fri. at 10:30 p.m. ENI attends the R.C. at Cincinnati, K4BTH moved into a new home and has a 75A-3 receiver, K4CMI is EC for Taylor and Hardwater Counties. K4MBB is active in the YL Club. K4CMI is now a PAM, K4MGT and K4AON are active on 6 meters. K4AEN and WHQ have new hams for 10 and 20 meters. K4YH moved into a new home and still uses the same antenna. O1V moved and has a new 814 transmitter. K4ESH and K4BLR moved into WCWV during the k.c. opening. K4J4Q is planning a radio club for 14 meters in Braxton County. K4KZF has a new Hy-Gain vertical on 20 mc. K4PF, TVO and K4J4Q were active in the F.M. Program. Comments toward a 40-meter phone net will be appreciated. TRUILL: K4KLF 98, W4HSA 73, K4SNP 73, U4D 73, W4VUI 54, W4TVUI 34, LEX 31, K4SBB 25, W4W 25, K4RAS 10, W4USH 10, SfP 7, K4MIZ 6, GALL 5, W4GFB 5, JAM 4, K4GAB 2, W4TI 4.

ROCKY MOUNTAIN DIVISION

COLORADO—SOM—Carl L. Smith, W4LRO—SEC: HZM: W4BTH and K4EFK, PAO: CXW and LJR. Obses: K4QD and K4DDC. New members are W4DZ and K4OYQ as Official Observers and K4QDK as O.S.S. PVA reports for the S.E.T.; show 40 participants in the Denver Area and 17 in Montrose. K4BTH and K4QDK are AECs for Boulder County. Section Net certificates were awarded to 25 members of CXW and 12 members of CEPN. Twelve members of CXW have received the Public Service Award certificate from 711 Subcommittee.
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KBDLS fm, Zero Beat, with BTO as editor, is a new publication of the Humboldt Amateur Radio Club and is distributed C.O.D. Not in print on 50.35 Mc, each Tue. at 1800 MST for the Denver Tri-county area. K6TP and SLD, former winners, are first on list. The Western Amateur Radio Club is hosting a new contest under the name of WCARC, Trif, W8ANA 531, KQD 526, KDTXK 550, KDM 526, KD4R 414, W4XME 120, K4XJ 116, K4HTT 110, W4BNK 63, K4HCW 60, K4QF 67, W4ENA 44, K4GC 49, TMX 31, EYK 23, QAN 22, SLD 18, W4A 16, K6LCZ 12, CEN 11, SUI 7, WBS 2.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM; John H. Sampson, 7OCX; SEC: FSC; RM: JBV; PAM: J8N; V.H.F. PAM: 8F; ASF: The Beehive Net meets daily at 1800 MST on 27.9 Mc. K7BDX and K7GGS have earned Beehive Net certificates. OLC was off the air for a period of 48 hours because of a severe windstorm in Northern Utah. K7BDX and K7GGS now have a weather beacon with NIX. W7H is been reconnected to the office of SCM. No new stocking was sent to K7BDX. One was sent to N7GGS in SaZ now has two sons licensed—K7BBD and K7BTQ. K7EEK and K7J7Q, AVEC nets in Salt Lake meet every Mon., at 2000 MST per contact and multiplier in 21.15-Mc, cw. Trifle: W7OCX 22, K7DVK 5, W7ZWJ 2, W7WH 1.


FIRST NEW MEXICO QSO PARTY
January 23-24, 1960

The Sandia Base Radio Club of Albuquerque announces its first New Mexico QSO Party and invites all amateurs to participate. New Mexico hams are urged to work as many out of state stations as possible, so that those interested can earn credit toward WAS and the Sandia Base Fellowship Award.

Rules (1) Time: 36 hour period, 0800 MST Saturday Jan. 23 to 0800 MST Sunday Jan. 24. (2) No time limit or power restrictions; all bands can be used. (3) Scoring: New Mexico stations count 1 point per contact and multiplier total by the number of states, U. S. Possessions, Canadian Provinces, and countries worked. New Mexico stations count 1 point for each New Mexico station worked; multiply total by number of counties in New Mexico worked. (4) Stations can be worked once per contact, and (5) A certificate will be awarded to the 1st, 2nd, and 3rd highest scoring station in each call area, and to the highest scoring station in each country, Canadian Province, and U. S. Possession; plus a certificate to the highest scoring non-New Mexico station in the U.S.A. A certificate will be awarded to the 1st, 2nd, 3rd, and 4th highest scoring station in New Mexico. (6) A Sandia Base Fellowship Award is given to any station who contacts 25 different stations in Albuquerque. Party logs showing required data will be accepted in lieu of QSL's. (7) General call: “QO NM,” New Mexico c.w. stations should identify by signing “1E NM” (call K.). “Phone stations are not included in NM.” (8) Exchanges: New Mexico stations send QSO number, RS or RST, and county. New Mexico stations send QSO number, state, possession, province or county. (9) Logs must be sent postmarked no later than Feb. 15, 1960 to: Sandia Base Radio Club, c/o John C. Kanode, KSUYF, 1900 Madeira Drive N. E., Albuquerque, New Mexico.
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of amateur band in each range as well as logging
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1 to 40 mc, with plug-in coils. For Phone & CW, Novice, General, C.A.P., Industrial. Complete with 8 x 14 x 8 cabinet, tubes, 40 meter coils & crest. Wt 40 lbs. $70.98
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WESTERN FLORIDA - SCM, Frank M. Butler, Jr., W4KH - SEC, PQW, RM; AXP and BVE, Tallahassee - New officers of the FARC are: J.R. Brown, E4RF, vice-pres.; and KIMTJ, secy-treas., GAA is active as OBS, Madison; High bands disturbed the antennas of ESF and RCO, but they had EC and OP, an RDF, and a drill. Port St. Joe: K793F is our new PAL. He is acting as net mgr. for the W8F, Phone Net on 8000 kc, Panama City: The PEARCS new call is K5QV, pres.; K4TP, vice-pres.; Marion Merlin, secy. FIU, treas.; and K4QW, asst. at amrs. KN4FOQ and K6VAE have dropped the "W". Ray H.S. Armstrong, N2A, and other officers are K4OIF, pres.; K4CEF, vice-pres.; K4QTH, secy.; and K42TYT, treas. Old-school FB never heard on 30 MC and Panama. K5QV has had a new antenna put in. After being on a high score in the CD Party, the Keylin ARS had another FB, a picnic at S1M's QTH, Pensacola; K4SWN has moved here from Marianna. The NAS Club is starting a training course. FIY is now 000. Traffic: K4URH 721, Old 33, W4GAA 16, PBO 2.

GEORGIA - SCM, William F. Kennedy, W4C2J - SEC, PMJ, FAM: LXX and ACH, RM: DDX, GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0830 Sun., C5M Mon. and Fri.; 3995 kc., at 1330 EST, 3995 kc., K4YGC as NC; GTAN Sat. at 1300 EST on 1700 kc., W4A on 1700 kc., Atlanta Tea Party Mon. at 2200 EST, K4YGC as Net; K4YGC Net Thurs. at 1700 kc., at 0000 EST; GAN on 715 kc., at 1500 Est. Mon., through Fri., K4ZP and K4ZG as Net; K4ZG as NC. This is K4YGC's third time and he is eligible to receive a mascot from ARRL. K4YFF is moving completion of a new 80-meter 36-element high gain high Q/L ratio reflection. GFWW transmits ARRL bulletins on 14 and 54 Mc. regularly. K4KDR is QRV 24 hours on 15 meters. The Georgia Teen-Age Net welcomes all teenagers to check in with them each Sat. at 1000 and 2200 EST. K4DFF is moving from Jacksboro, Tenn. to Savannah, Fla., back to Savannah, Ga. The Peachtree welcomes her back. Also you gals, don't forget each Thurs. morning the Peachtree Peach holds their Net at 0900 EST. These are a few openings for ECs in Georgia. Register your county with PAJL, your SEC, or appointee. You must be a League member to hold this appointment. K4YDP and K4ZFR are new ARRC members. Remember, in an emergency listen before you transmit. Traffic: WA71JF 45, KA1DF 75, EI1 134, BYD 128, LVE 122, BAL 121, UV 30, G5I 29, PHA 20, WZP 45.

WEST INDIES - SCM, William Werner, K4P4J - SEC, AAA. New ARRC members are CK, CL, SR, NY, AAB, AAN, ABN, ATS, AND, AMG, AVG, AOD, AOF 1G and 1P. The 50-50 with ALOA and WRA, conducted a Simulated Emergency Test with twelve stations filing messages. DJ relayed messages to WIAW on 10 meters. AM operated with emergency endorsement. During the S.E.T. MARS K4U4RA is reactivated as Port Brookes, operating mostly on 21 Mc. with K7TIE as controls. The Antilles Weather Net, on 7200 kc., is continuing its discontinued weather observations with the close of the hurricane season but continues with routine traffic on 7245 kc. at 7 A.M. and 3815 kc. at 5:10 P.M. AM, our OO, has sent several notices to W stations operating phone below 21,250 kc. and to s.s.b. stations who fail to identify as required. AMU is now MARS AHC and checks into ANTIARS every Mon. on 7005 kc. at 1800 AST. New trains at the major tracking station at Juan Juan are AXS, AS1, AS2 and AS3. Denver, Colo. AAB has a new 7th. By-Gain high element beam on a 30-ft. tower. AMU also put his beam on the beach on a 30-ft. tower. AMU also put his beam on the beach on a 15-ft. tower. KD9 and 8, ABD has a new G4/2 with a 2000-cwt. truck, ARK has a new 21,260 kc. at 8 P.M. ARK has turned out the plate of the electronic in the DSF-100, A4L has a VHF-122 converter for AM and 2 meters, KD9 has a new G4/2 with carrier (a.m.) ATZ is a new TEC, at Janos using a G4/2-Bander on 50 Mc. with a 2000-cwt. truck, and a TVG-3/2 with a new 400-cwt. truck, 3S4 has worked 14 T0 stations on 30 Mc. in the past few months. ARK converted the DX-35 for 50-Mc. operating. W7UJ now is hooked up to VHF-122 at Los Angeles, Brandeis. W7UJ has also installed a new gain-1000 beam, DJI is building a new antenna on this same system, operating on 21-28 Mc. IAB added a modulator to the ARS-20 and is active.

(Continued on page 142)
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on 40-meter phone. UW, our FCC engineer, is on a Stateside vacation. WL, Aquadilla, has moved to a new QTH. YV is president of the Aquadilla Lions Club. Traffic: KPAWT 71, ABN 27, CK 27, DJ 24, AMU 4, AAN 2, ARQ 2, AMJ 2, ASH 2, AJE 1, AYI 1, AMG 1, AQJ 1, BR 1.

CANAL ZONE—SCM, Ralph E. Harvey, K2ZRV—In lieu of the Annual S.E.T., Canal Zone hams installed a security network for the Canal Zone Security Force. Various tests were made to establish communication from various points in the Pacific Area to command headquarters, facilities for home-carried battery-operated units on 47 Mc. On Oct. 31, amateur radio operators established a control station in the Bahia This is for the purpose of setting up units to various homes to make collections for the United Fund Pledge. LC reports that he worked 180 CW stations in 50 sessions in the October CD Party. The Canal Zone has several new Novices, one of whom, PRL, is the Executive Secretary of the Canal Zone. The youngest General Class operator in the Canal Zone is CB, who is 12 years of age. The youngest Novice is DB, who is 10 years of age. New names: HBCY, FO, HN, OA, RA, VB, VB and WP. New Novices: ATN, DNT, GCN, HRN, PRN, WCN, WHN and WVN. Traffic: K2ZEQ 13Q, AD 18, ON 17, OA 15, HC 30, LF 24, RA 20, YV 22, RE 22, RM 19, CD 12, LL 12, LF 9.

SOUTHWESTERN DIVISION.

LOS ANGELES—SCM, Albert P. Hill, Jr., W4RGB—SEC: W4LBP, RRs: W4BHQ and K4HHL, PNs: W4BHQ and W4ORS, The following stations earned BPL for October: K4HHL, W4GYP, K4GWA, W4WPP and W4NDEO. Congrats, fellows! K4GWA is back in the Navy. W4GWA is on RTTY with a Model 26 printer. W4NDEO is doing an FB job with a new 20-meter two-handed ham radio shack. W4GWA visited many hams and clubs while on a trip East. W4AMW worked V4BRRB on Brandon Island. K4HHL had a new trip to Arizona. K4HHL is in a new home and sporting a new NC-305 and a Thunderbolt. W4BHQ worked a USPS with 24 watts! W4WPP has a new RTTY rig, and KB4HHL is on the traffic nets with a low antenna! W4NDEO is QRL with the printer's ink. W4GWA did very FB in the ARRL 340 Contest. K4GWA and KB4G city is getting the rig going at a new home, K4QGD is back on again after a long absence. The Douglas-Pi Segundo Radio Club is conducting code and theory classes on the 3rd Tues., of the month. W4MIDQ is president. New officers of the South East Radio Club are K4KCU, pres.; W4EDC, vice-pres.; K4KBU, sec.; W4VFCY, asst. W4ORS is back on 2 meters from a new QTH in Altadena. W4ORS is sporting a new ARCD 4550-A receiver. New officers of the Ramona Radio Club are K6TVc, pres.; K6VNX, vice-pres.; W4QIV, treas.; W4QIV, secret. Support your section nets: W4QIV, the Southern Californian net meets at 1900 Mc. from 1600 to 1700QIV, the Southern Californian net meets at 1900 Mc. from 1600 to 1700 Mc. from 1600 to 1700 Mc. from 1600 to 1700 Mc. from 1600 to 1700 Mc.

ARIZONA—SCM, Cameron A. Allen, W7OCF—PAM CSN 3899 box, FMI, CEN Tucson meets on 29, 0600, 29, 0627 and 149, 800 Mc. CAP is the new SEC. The Catalina Hilo Bobo held a transmitter hunt. Joy Sims came in first with Howard Dowdwa second. Joy won by tripping Howard in the dark. Jim McCluskey ended up in Boston. CBC handled communications for the Big Car Club recently. The members are repairing and keeping serviced motor generator sets for the CAP. For this service they are allowed to use the AMELZ microphone away Oct. 29. CAP made 139, 128 points with 731 contacts and 60 sessions in the Sweepstakes. AARC members UDI, QZL, WYM, MAE, UXZ and EZATW handled communications for the Big Car Race at the State Fairgrounds. AML is back with us after a 3-year stay in Italy. Traffic: W7OCF 51, AMM 40, DRI 37, CAP 26, FMI 24, K3OV 747.

SAN DIEGO—SCM, Don Staif, W6LAU—New Novices in Escondido include PMU, PHI and PATF. K6PBM broadcast a traffic report on 1153 in October. The YOIs of W6FDQ and W6ATEB is now on VHF. Our Division Director, W6MLZ, after a year in Chicago is now working in San Diego. Council of Amateur Radio Organiza-
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WEST GULF DIVISION
NORTHERN TEXAS—SCM, L. L. Harbin, WARB—Aruba; SCM, J. C. Pool, SNFO, SEC: KXAEW, PM: BOO, JHE; KATXJ, October seems to be activity month for Northern Texas with all the hamfests and emergency tests taking place and hams getting ready for the Sweeps tests held in November. Ham Day at the Dallas Fair was a great success with more than five hundred in attendance. The Ft. Worth Hamfest held Oct. 21-25 had 650 registered. This was a let-down from the 1500 that were registered last year. NFO reports 250 hams at the Free Brownfield Swapfest Nov. 1. Gladys, KEMRS, thanks they are have established a new record of some kind, as the OMs had to be for the XYLs to finish their gadget to go home. It looks like the XYLs are taking a more active part in our favorite hobby, Mrs. Joe Satterwhite, Manager of the Brownfield Chamber of Commerce, praised the hams for their willingness and ability to render a public service during ice storms and other local disasters. Sixty-two YLs attended the TULRUN Birthday Party at Shangri La Dance Ranch near Ft. Worth over the week end of Nov. 7. New officers are KASLF, FPB, vice-pres.; KSMJW, sec.; and KAMXD, SRF. KASKC is drafting instructor in the high school at Overton. KUEHT (Perfect Horn Trotter) is a band director and his name is John Horn. Thanks for the news and I am sorry that I could not use all of it this time. Traffic: WATTW 306, GW 115, BOO 96, KGER 62, WJGSN 45, KACD 20, W3CF 12, KPEXY 10, IDZ 9.

OKLAHOMA—SCM, Adrian V. Rea, W6DRZ—UYQ is doing a good job as SEC of Oklahoma. The need for a good AREC was demonstrated again when flood plagued the State in early October. Three AREC groups had a good workout. Edni and his group, KSPRY, IDO, UND, LYM, OVD, WSKY, KGBQG and AAW did a bang-up job furnishing communications at Lake Atanas in the search for a drowning victim. Muskogee AREC was called out to patrol the Arkansas free flood threat area. Mobile units were KSCAT, PRW, RCW, OQV and WAX, EC. Edni was used as the base station. Public Service Awards have been presented to forty-one amateurs who put in twenty hours or more during the crises along the Arkansas at Tulsa. We hesitate to mention calls as space does not permit naming all. Among the first mobiles were K2KUX, DWE-DPV, NW 300 and HDO, KSKTW is EY, JBR is emergency chairman of the mobile club and ZBI is president. QFJ was civil defense station and

(Continued on page 146)
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SIXTH ANNUAL VEI CONTEST
January 30-31, 1960

All VEI amateurs are invited to participate in a contest sponsored by the New Brunswick Amateur Radio Association. The highest-scoring contestant will be given an engraved cup, the New Brunswick Amateur Radio Association Trophy, and will have permanent possession of same.

Rules: 1) The contest will begin at 8:00 P.M. EST, Saturday, Jan. 30, and end at midnight, Sunday, Jan. 31. 2) Any and all amateur bands may be used. Phone-to-c.w., phone, phone-to-c.w., c.w.-c.w., c.w., phone-to-phone, phone, and 2-meters c.w. New amateur station may be counted but once for credit. any amateur station authorized by a code license, no other amateur may count it. 3) The general call will be QO VEI. 4) Exchange signal report, county and province, time and date. 5) Score one point for information sent, two points for correct frequency. 6) Log must be mailed to the Contest Director, VE1C, no later than March 1. 7) All information must be sent to the Contest Director. 8) Decisions of the contest committee will be final. Logs must be postmarked by Feb. 8 and should be in the hands of the committee not later than March 1. Send them to W. H. Smith, VE1FC, Contest Committee Chairman, 173 Broad Street, Saint John, New Brunswick, Canada.

now VE2YH, VE2AK has returned to Scotland from here. VE2AK has moved to Edmonton, Alta. VE2AM will move to Calgary, Alberta. VE2JR has moved to Lethbridge, Alberta. VE2YN, OC's call is effective as he has been transferred to another ship. Reports from OC would indicate that all calls are active. (Continued on page 148)
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the Halifax gang has antenna fever! The Loyalist City group recently participated in a very successful c.d. exercise. Traffic: VEEAEB 26, ADH 24, OM 4.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The London Convention of the ARRL Ontario section, sponsored by the London ARC, took place last weekend from all angles. Well over 200 sat down for the dinner on Sat. evening, Alex Reid, Canadian Division Director, just a few days back from the QRP Congress in Washington, D.C., gave the gang the latest information from there. F. E. Handy, WB1D, ARRL Communications Mgr., also was in attendance. Over thirty candidates were initiated into the Royal Order of the Warrant Hams at the midnight hour. A successful S.B.T. was held by the Ontario ARRL members in October. AVE: W3AOL, was back in the hospital in Toronto. IB had an accident to his eye. Get well, Wally, DPO is a new RM with the Grey-Bruce NO, now 75 meters. The Ontario Amateur Radio Assoc. has over 500 members. Members of the K.I.T. Radio Club operated an s.s.b. station at the L.R.E. Convention in Toronto QE. Our QSL Mgr. writes to you that he has over 800 QSL’s. Send him a self-addressed stamped envelope. Some of them may be yours. May I remind all of you who hold ARRL appointments to get them to me soon as you can and have them rebound if they are overdue. Too long a delay may cause cancellation. ARI works FB DX on 28 Mc.; DKO likewise. BQL was a visitor to Hamil
ton. NZ is back on 75 meters. RH has a new Apache. GH visited NO and AIA at Medford at Thanksgiving. Kingston voted ATL, pres.; ELL, vice-pres.; CVY, secy.-
treas. DE has a new HRO. The daughter of SXC is Mrs. University of Toronto. NO is back on 75 meters. RB and NG are back on the 20-meter band. Shure, DE, is a new ARF. ELC and BIV were portable at Lake Mazinaw while deer-hunting. DIO is in VE7-Land until Christmas. Traffer, VE3C, call is NG 62, CFR 35, TM 27, AIU 46, GF 31, EAM 27, BZB 25, DZA 23, DYG 19, DIO 9, DLA 8, DWN 5, VQ 4.

QUEBEC—SCM, W. S. Sherman, VE2DR—BE is back from Geneva. HX is leaving for Ontario. QSL cards for FFSB/GC, go to ABE, who promises 100 per cent reply. VE2SV, who also is FFSB/VE, now exports a VE2 call. AVE, after the numeral in VK calls denotes v.h.f. operation. VEA2V is now signs /W1 from Derby Line. A1G/SU oper-
ing from Gains Strap pub. as a strong entity on 10 and 15 Mc.

Ex-VE2XR now signs VE2XN. ATL attended a Civil Defense course, ANQ is a newcomer in 8t. Laurent. ABE has 90/80 toward DXXC. "Le Cercle des Ama-
teurs de la T.S.F." with the call club DN started up activity with a new committee and meets every 2nd Mon., 8 p.m., at 2225 Louier East. French speaking hams are invited. BY the club station at Hull, will operated remote via the 220-Mc. link. The transmitter is located 12 airmiles north of Ottawa. CJO Club elections were held in December. Your SCM enjoyed visits from BEU and 3FAM, VA is the proud owner of a 73A-4 receiver. FAK, VE3KL, has a new home phone and c.w. WY snaps up good DX on 28 Mc. VEA2W is active in the VE3 section. AB2 reports excellent monitoring during dancing. New hams are enthusiastic newcomers at Louisville. OA is ex-APP. AWO keeps the 75-meter mobile ready for any emergen-
cy. Other places are using their rigs for QRM for any traffic. BAT is ex-GB/2 and ex-VEST. Ex-PX, who signed 3AUP, now has a new call. STL stations north of Quebec are invited to report, Traffic: (Oct.) VE2WH 269, DQ 28, EQ 19, ABE 10, JF 4, CP 2. (Sept.) WA2CNS/VE8 75.

ALBERTA—SCM, Gordon W. Hollingshead, VE8VM

--I wish to thank those of you who have contributed to the task of filling this column. Many of you will have expired at this printing and I sincerely hope that you in the Alberta section will continue to support your SCM. I have pledged myself to establish a crack c.w. net in Alberta and will continue to work at it until it is a reality. MP is sporting a new Chey-
enne Fords. HM has recently returned from Nova Scotia and has installed a 73A-4 for his northern traffic skeds. AAY is keeping a nightly sked with her daughter EAAE/GM, Oklahoma City. AVE is sporting a new Hy-Gain all-band vertical. New ex-

ecutives of the CARA are KM, pres.; RY, treas.; DZ, secy.; EJ and PB activity; EJ and RL, directors. License plates again are being dis-
bursed by the NARC.

Many thanks, LY, for the fine line you are doing, and a related item. AVE congratulates you all on a Happy New Year to all. Traffic: (Oct.) VE8VM 98, VE 27, CA 24, TG 9, TT 7, FS 6, 0Y 6, OC 3, YQ 3, IP 2, ES 1. (Sept. and Oct.) VE8VM 161.

BRITISH COLUMBIA—SCM, Peter H. McIntyre, VE8TI—The following news was submitted by AOT.

(Continued on page 150)
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<thead>
<tr>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impedance</td>
</tr>
<tr>
<td>Frequency Range</td>
</tr>
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<td></td>
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<tr>
<td>RF Connectors</td>
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<td>Power Rating</td>
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<td>Range of Correction</td>
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Bob, W4AYJ
Sid, K2FC

AQUA is busy building a new rig to replace the 2E26. AAF has gone big time, is now on TCC, and is planning an 816 rig for the big job. The BCN6 started operations at 1900 to 2230 PST, to help increase coverage and speed the delivery system, which has been sadly lacking. The late sessions are following the old pattern, with DX-1000 on the air and working FB. TW, OS, and HD are back on 75 meters after a long silence. It's nice to hear George, WA8X, and James, W8XJ, on a trip to England. PH has been working out very well on 20 and 10 meters. The mobile gang has been quite active with newcomers and others. W5E, W5Z, and K5K and CJ and KP have been active on 2 meters, while on 5 meters we hear BL, GN, TX, DJ, HS, SH, and WS JW, and his Beuthnag Radio Club has been quite active raising money to obtain a power plant for emergency work as well as for Field Days. EH, of Whistler, has been busy on the higher frequencies and has also answered the Manitoba Net. We congratulate Larry and his XYL on the birth of their son, MJ. We wish him a wonderful new Wonder Bar constructed working on 10, 20, and 75 meters with great success. If FY finally has the 4-250 rig working 48 hours of the day, PW, at Flyn Point, is most active this AM with a 240 putting a fine signal on 75 meters. AX and RB are back on 75 meters after a signal swap. SH, CT, WP, and PR are mobiles that have been heard out of the farthest from Manitoba on 75-meter phone. Traffic: VE4PE 23, EF 7, JW 6, QD 6, EH 4, XP 4, AN 2, PA 2, PW 3, EQ 1, MJ 1.

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St. Louis 1, Missouri

The trip to Indian Ocean islands decided he cannot go. At 120 dollars a day he can do more duty for another charter, VQ6T, and myself have not given up, although things aren't quite at the bright at the present time. VQ8AJA should be on from Azuaga and there will soon be a new station in the Chagos. A new one is active in the Antonia with 150 watts and a single quad. VQ9BBB continues busy every day on 14- and 21-Mc. c.w. and phone, 1200-1400 GMT and 100 watts. There now is a permanent station on 14 Mc, in the Scy-
chelles, a resident... K9KAB informs us, "ZD2JM stationed in Scotland, returning to Nigeria in a matter of days and will return to finish his last ZD2 label. John should be operating until October, 1960, from Kano, Kika, or Kaduna... EL-QA communications, "I plugged to 39 neighborhoods, record with 1435 DX contacts in October, 411 of these on phone. I'm still trying to work Norfolk but they don't seem much interested. YL Mary K9QK, 12-15 April will be on 10 Mc, rig-
ningly on 15 phone between 1400 and 1000 GMT, looking for YL-DXC hunters... Via W8MAD, K1WCZ tells us that VK4WR seeks KJ, NT, HF, and YL DX on 50 Me, to complete WAS. From W12J, H1RF/6, c.m., SV8 from K1AQ/A, is aboard, sailing and flying around the world on an oceanographic tour. Hope to see QSO the bretheren with a KWM-1 on 10, 15, and 20 band and for the next eight months, Kiihi island was a recent stop and it's hard telling where the NCP will next stop. Be alert.

W8DQ and K5PM ran into QO4AA who operates his DX-10 and Super Pro on 15 or phone aboard a Congo River boat assigned to the international group of oblique increases. You can appreciate a QRS but his English is so rough that it's hard to follow your French or Flemish... WGDX, W7CQ, VEORON of these areas; times: Renewed F5BBY action is in the cards... SU1IM expects to consolidate his donor position and leave the tropics by March... Libya kept no DX reports from AK70 who goes back home with a 222/210 tally.

Oceania—ZK1KS should surface in a deal or two by now after a lively Stateside visit. "Kindly convey my sincere appreciation of the wonderful hospitality shown by so many friends and families — too many to mention individually — to my wife and myself during our nother-to-be-for- given visit to your wonderful country. I regret I was unable to visit many good friends, for whom extended kind invitations to stay with them but time did not permit... Fine, OM, and come again. ZK1KS"... FO8AC is now very active on 1200-0700 GMT and at other times as well... W4KWC. "George was usually on about 1400-14050 kc. with a fine signal and fast, please no schedule..."
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PROFESSIONAL QUALITY COMMUNICATIONS RECEIVER
- ENGINEERED FOR THE AMATEUR
Superheterodyne Circuit Utilizing 8 Tubes & Rectifier Tube

- BAND SPREAD FOR EASY TUNING
- BUILT-IN "S" METER WITH ADJUSTMENT CONTROL
- ACCESSORY POWER SOCKET PROVIDED
- EXCELLENT SELECTIVITY • ALL TRIMMERS PRE-ALIGNED
- COVERS 455KC. to 31MC. IN FOUR BANDS
- VARIABLE BFO AND RF GAIN CONTROLS
- BUILT IN PRE-CALIBRATED "S" METER
- SWITCHABLE AVC AND AUTOMATIC NOISE LIMITER

High sensitivity superheterodyne circuit utilizes 8 miniature tubes plus rectifier tube and transformer input, full wave rectifier. The 80-40-20-15 and 10 meter amateur bands are clearly indicated on the illuminated dial face, and can be easily tuned with the pre-calibrated band spread. The receiver has complete band switching, thus eliminating the need for bothering plug-in coils. Band spread is set out on easy-to-read 0-100 scale, and features a weighted control knob which offers smooth, precise tuning. Coverage of from 455 KC to 31 MC is obtained through the use of four switchable ranges (455-1600 KC/1.6-4.8 MC/4.8-14.5 MC/10.5-31 MC). All controls, switches and phone jack are located on the front panel, while an optional accessory socket delivering 300 volts DC and 6.3 volts AC is located in the rear of the receiver. Signal to noise ratio is 10 DB at 3.5 MC with 1.25 millivolt signal. Selectivity is — 60 DB at 10 KC, image rejection is — 40 DB at 3 MC. Panel is grey metal with white lettering, and controls are black bakelite with aluminum trim. Hinged top makes inside of receiver readily accessible to operation. 7½" H x 15" W x 9" D. Shpg. wt., 22 lbs.

KT-200 64.50 8.00 Down Net 64.50
HE-10 Same as above, factory wired & tested. 8.00 Down Net 79.95

FREE! 1960 CATALOG
whole cause is that it is quite easy for anyone to get an amateur radio license. Who can't pass a novice exam? I'm sure this is pretty obvious since one out of every 900 Americans is an amateur.

What I would suggest is taking away the novice license once and for all. This will probably cut the number of incoming amateurs by better than 90%. In conjunction with this, I would suggest cutting down the code speed required to pass a General to about 10 w.p.m. I am sure that in due time our bands will be again at peace and all of us can pursue our hobby without struggle.

— Peter V. Guidi, W4MRB

STATESIDE DX

1001 N.W. 17th Court
Miami 3, Florida

Editor, QST:

Regarding the letter from W7TVX in the November issue, I can't see that any purpose would be served by granting hams outside the U.S. country credit for each state worked. Granted that Europe is crowded with little countries, but the ham population of each of them is small. Certainly their number of licensed amateurs doesn't even begin to approach the number in any of our states. A ham outside the U.S. can sit back and pick off the states one by one with relative ease. The U.S. hams on the other hand, have to fight pickups even to work so commonplace a DX country as Great Britain. With the U.S. counting as our country credit, all the world's amateurs are put on much the same footing, and this makes patience and good operating a prime requisite. DXCC is meant as a test of operating skill. Let's keep it that way.

Tom Fleming, KARSZ

CULTIVATE MANNERS

2506 Dandurand Street
Montreal 30, Que., Canada

Editor, QST:

After thirty years in amateur radio I am sorry that my first letter to QST has to be a complaint. When working on 20m SSB I have above, several other Canadian amateurs and I have been told very rudely to get off the frequency. To the one or possibly two American amateurs I say this, "Try to cultivate manners the way you accumulate equipment." My station is homemade with a vertical ground-plane antenna and I do not hear all of the DX stations. If I am causing QRM, give me a polite call on 20m to QST up on or down by 5 ke, and I will be very pleased to do so. This hobby is for relaxation, not for heart attacks or ulcers.

M. A. Pearce, VE2AJP

BE A HELPING HAM

RFD
Havana, Illinois

Editor, QST:

Recently, in my duties as an Official Observer, I sent a cooperative report to a KN9 in Indiana. It was concerning a bad ship. Not anything unusual, but in a few weeks I received a card (not just a card, but a QSL card) from him. He informed me that he was glad to get the report card and had remedied the trouble with the help of W9. The remedy was a large bypass on the key, and better filtering in power supply.

In many months as an OO, I have wondered what has happened to some of these report cards. Were they torn up and thrown in the waste-paper basket to be forgotten? Could it be that the person on the other end thought that one of these days he would look into the trouble (but never found the time) and didn't think it was worth the paper it was written on? Or was he just plain petrified at the thought of it and stayed off the air a few days until the trouble just "faded" away?

I listen to the "sour" signals on the air, and I ask myself, "Doesn't he have any feeling for his fellow amateur?" But worst of all I look at the list of reports.

Then I receive the card from the KN9 and I realize that there are some good operators even among the Novices (you know, the class of operators that all the other operators stick up their noses at).

But one of these more experienced operators took out time to help a lowly Novice. The end result was better than (Continued on page 156)
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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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1 kw S/C-F 5 band kw coils...
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Overall length 40" 40, 20, 15, and 130 m.
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CONTESTS VS. TRAFFIC

2274 University Avenue
New York 8, N. Y.

Editor, QST:

After listening in to the ham radio, many conditions that prevailed during the “Swepsstakes” contests, I feel that some improvements in rules and conduct are very much to be desired. It might be compared to weekend traffic congestion on the highways. Unloading all the contestants at the same time on all portions of each band causes the bottling up of all channels so that it is not possible to get any traffic through the mess.

The effect of the contests as they are now conducted by the rules is to choke off the regular flow of traffic, resulting in a break-down of communications via ham radio.

I had some urgent traffic for Philadelphia, but could not get through the 40 meter band, (I resorted to the Bell System and got my message through that way.) It doesn’t seem like good sportsmanship to deprive the non-contestant of the use of any amateur band by logging all the frequencies in the various bands for contest use.

Would it not be fairer and more sensible to share each band 50/50 when the contests are run? One half of a band to contest allocations, and the other half to the normal amateur activities?

I don’t think that the FCC ever intended to deprive any duly licensed amateur the use of any of the bands, but the contests (as they are now conducted by the rules set up by you) do just that. It is evident that these so-called contests certainly are no fun for you to be proud of. You have succeeded only in congesting a hams band. Just try and find a spot and hold it long enough to get a message through the contestant...

Frederick B. Haus, W2SP

Novice Roundup

(Continued from page 61)

5) Reporting: Contest work must be reported as shown in the sample form. Reporting forms and a map of the United States will be sent gratis upon request. Indicate starting and ending times for each period on the air. All Roundup reports become the property of ARRL and must be postmarked not later than March 5.

6) Awards: A certificate and will be given to the highest-scoring Novice in each ARRL section.

7) Disqualification: Failure to comply with the contest rules or FCC regulations shall constitute grounds for disqualification. ARRL Contest Committee decisions are final.

Table-Top Half Kilowatt

(Continued from page 27)

“Flattening” region as an s.s.b. Linear. (It can be operated this way on c.w., however, since linearity is unimportant here.) If the loading is too heavy, the grid current will be low when the cathode current reaches the proper value, but the efficiency will be low and the tubes will overheat.

Getting the knack of it takes a little practice, but when the job is done right the tubes will run cool on all bands in regular operation. Running key-down over a period of time may show just a trace of dark red color on the plates since the input and dissipation are somewhat over ratings under these operating conditions, although perfectly satisfactory with ordinary keying or s.s.b. voice.

(Continued on page 165)
ME? OFF FREQUENCY? NEVER!
I TRANSCEIVE... WITH
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VFO-MATIC

No foolin’—This character is right. With the VFO-MATIC your 75A2, A3, A4 or Drake 1A receiver simply takes over frequency control of the transmitter. May be used on such exciters as the 10B, 20A, HT-32, Gonset, Phasemaster or other 9 MC types.

The VFO-MATIC is a xtal mixing unit having one adaptor which simply plugs into a receiver tube socket and a second adaptor which plugs into a tube socket of the exciter. Calibration and sideband switching are not affected in any way.

Like SSB—TRANSCEIVING IS HERE TO STAY. If you are interested, drop a card or letter to Dept. 13Q for information on using a VFO-MATIC on your particular receiver-exciter combination.

VFO-MATIC complete, ready to operate, with xtal, adaptors, cables for your particular lashup. Price $142.95

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OTHER FINE P&H GEAR
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L600M and L200M Hi-Power VHF Linear
AFC-1 AFC-2 Audio compressor-Amplifiers
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Don’t just gripe about loose coils and leads. Get Waters unique triple-tight ribbed ceramic coil forms. Tight leads, tight lugs, tight parts! Complete line. Write Waters Manufacturing, Inc., Wayland, Mass.

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That’s about it. Once you get it built and learn to operate it, you’re in the high-power class—with a table-top job that takes up no more room than a good communications receiver. Nothing under the table, either.

Radioteletype Conversion

(Continued from page 56)

cycles lower. The 50-0-50 microammeter should show equal readings either side of zero. A smaller-range meter could very well be used for a more sensitive indication, but the one shown was already on hand.

For a more precise indication the vertical deflection circuit of the CV-57 scope monitor was built into the unit. The circuit is shown in Fig. 3. It obtains the deflection signal from either the discriminator or the output of the second audio amplifier, whichever is selected by a push-button switch, $S_4$, on the front panel. The circuit also provides an adjustable vertical centering voltage, by means of $R_7$, when the deflection is taken from the discriminator. The external scope must have a 60-cycle sine-wave sweep and a balancing d.c. voltage must be applied to the second vertical deflection plate to permit adjustment for linear deflection. For calibration and for a sensitivity check on the second audio amplifier and scope, a small 60-cycle voltage taken from the filament supply is applied to the grid of the second amplifier through $S_4$, and the deflection from this voltage, when viewed on the scope, should correspond to 17 volts peak-to-peak at the plate of the second amplifier. Deflection by the discriminator output should be approximately the same, and can be adjusted by $R_6$.

The power supply is a conventional regulated supply with the addition of a 6X4 rectifier to provide — 45 volts grid bias to cut off the 6AQ5 keyer tubes, along with — 150 volts for the scope monitor circuit. There is also a separate 125-volt supply using a selenium rectifier for the plates of the 6AQ5s.

The polar relay, a Sigma 7JOZ-160T, was used because of its compactness. The standard WE 215A may be used if chassis space permits. If desired, the polar relay may be eliminated entirely and the printer magnets operated directly from the 6AQ5 plates, using the loop power supply with proper polarity. It will be found, however, that this is adequate for only one machine, while relay keying can be used for more than one — for example, a printer and typing-reperforator.

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**COMPLETE PLANS $1.00**

- No Stubs
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- Very Broad
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- 23 DB F To B
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2 & 6 METER CONVERTERS

2-METER FEATURES INCLUDE:
- Crystal controlled.
- New 6E5B high gain, low noise, cascade first RF amplifier. 6U8A second RF amplifier-mixer. 6AU6 oscillator.
- Spurious and image rejection—over 70 db.
- Noise figure better than 4 db.
- Gain—over 30 db.

6-METER FEATURES INCLUDE:
- Crystal controlled.
- 6ES7 cascade RF amplifier and 6U8A mixer-oscillator.
- Spurious and image rejection—over 70 db.
- Noise figure—better than 4 db.
- Gain—over 20 db.

The Ameco Converters are housed in a compact (2½" x 2½" x 3") 2-piece brushed copper chassis. Comes in any signal that can be heard on any commercially available converter. The IF output on both converters are easily changed to allow converter to have any output frequency for hook-up to any receiver. The power requirements of 10 ma. at 100 to 150 volts DC and 35 ma. at 6.3 volts AC for the 6-meter converter or 30 ma. at 100 to 150 volts DC and 1.15A at 6.3 volts AC for the 2-meter converter can be obtained from the receiver or from the Ameco Power Supply, Model P5-1, also housed in a 2-piece copper chassis. Power supply can deliver 50 ma. at 125 volts DC & 2A at 6.3 volts AC & may be used to supply power to many accessories around the ham shack.

10 meter, 15 meter, Citizens band, Police & Fire converters also available

Converter complete with tubes and crystal for 7-11 Mc. or 14-18 Mc. in kit form with instructions.................................................. $19.95 $23.95
WIRED AND TESTED (with tubes and crystal)................................................................. 27.50 33.95
Power Supply complete in kit form, Model P5-1.............................................................. 10.50
WIRED AND TESTED, P5-1X.................................................. 11.50

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- THREE BAND
- TWO BAND
- SINGLE BAND

TENNALAB 417 S. Tenth St. Quincy, Ill.

DYNAMOTORS

<table>
<thead>
<tr>
<th>Type</th>
<th>Volts in</th>
<th>Volts out</th>
<th>@ MA</th>
<th>Used</th>
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<td>250</td>
<td>60</td>
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</tr>
<tr>
<td>DM-32</td>
<td>28</td>
<td>250</td>
<td>60</td>
<td>1.95</td>
<td>3.95</td>
</tr>
</tbody>
</table>

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Living costs have gone up! Need money? For sale: Regency All-band converter ACT-1. Never been used. Still in original box with $1,150. Also Master Mobile Mounts "All Band" 656 coil and 68-66 whip. Never been used. $12.50. WILSON, 416 S. Hamilton, Moline, Ill.

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**GUNS**

Wanted, trade my gam gear for them. WZLII.

WANTED: Large, long range antenna and power supply to match a pair of 810s. Desire about 300 watts audio. B. Graham, Box 143, Morganton, W. Va.

**ATTENTION!** Our radio club is in need of a transmitter. Any ham wishing to donate an unused piece of gear please contact Arthur Johnson, W3VZM, 321 Cemetery Rd., Watertown, Mass.

**FOR SALE:** Heath AR-1 receiver with cabinet and M-Q, exc. cond. $35. KNBRCA, 3509 Harding Road, Jackson, Mich. 49203.

**FOR SALE:** New condition, exc. performance. Ready to operate, $195 or best offer. BC-221 frequency standard, calibration book and power supply. $80.00. Will sing interested parties. George V. Cresson, 120 Larrabee, Charleston, W. Va.

**NEW EICO**

270 transmitter, excellent. Service rig $100 F.o.b. Batavia, Illinois. V. Schroeder, KYFQF, 522 Park St., Batavia, Ill.

**COLLEGE**

Living costs have gone up! Need money? For sale: Regency All-band converter ACT-1. Never been used. Still in original box with $1,150. Also Master Mobile Mounts "All Band" 656 coil and 68-66 whip. Never been used. $12.50. WILSON, 416 S. Hamilton, Moline, Ill.

**FOR SALE:** Antennas: Delaney 4237, 6300. $10.00. 30" mast. Will sell for $4.00. Collins 32V3. All letters answered. Wm. J. Garrett, 102 E. Scottwood Ave., Elgin, Ill.

**FORD**


GLOBE RC-7, with antenna relay, condition excellent, $40. John Libbey, 16 Dorchester Ave., Hastings-on-Hudson, N.Y.

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168
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REPORT FROM GENEVA

We Keep Our Frequencies!

As most amateurs know, during the past four months delegates from more than 80 nations have been meeting in Geneva, Switzerland, for an Administrative Radio Conference of the International Telecommunications Union. The purpose of the conference is to examine and revise the world’s radiocommunication regulations, last established at Atlantic City (1947), in the light of new developments and requirements in the intervening twelve years. The complexity of the task can perhaps best be illustrated by pointing out that in the United States, for example, groups of government and industry communications experts commenced preparatory work more than three years ago, and that 30 government delegates plus up to 50 industry consultants and advisers have been attending the conference in Geneva to represent our country and to negotiate an outcome satisfactory to the needs of our various radio services. For the few amateurs who may not realize it, let me point out once again that your League, as the representative of the amateur radio service, has participated in every relevant aspect of the domestic preparatory work and in the entire conference proceedings, with four other League officials present at various times in Geneva in addition to my own full-time attendance.

As I write, the conference is drawing to a close. All matters of substance have now been decided. Dozens of study groups and special “working parties” assigned specific tasks have, during the past month, completed their complex jobs and reported to subcommittees, which in turn have reported to parent committees. Continuing this process, the main committees have finally reached agreement on their particular portions of the huge volume of regulations and final decisions have now been made by the Plenary sessions.

Thus for the first time it is now possible to state, with certainty, the outcome of this conference as far as the amateur radio service is concerned. As the culmination of three years’ formal preparatory work and four months’ intensive participation by the League in the conference itself, it is with considerable gratification that we can report to amateurs that the Geneva, 1959, radio regulations will continue provisions for every frequency assignment now available in Canada and the United States.

A subsequent issue of QST will carry the complete and detailed story. It will outline the numerous proposals of some other countries for major cuts in amateur frequency bands, and describe how these proposals were eventually defeated — at least as concerns their direct effect in our own portion of the world. It will, regrettably, have to report a few instances of reduction of amateur privileges in certain other parts of the globe, although in my opinion the amateur body in general made out quite well internationally, considering the obstacles it had to face. It will also report on the brilliant and obviously effective manner in which our United States delegation, as a closely knit team of capable experts, carried its assigned task to a successful conclusion.

A. L. BUDLONG
General Manager, ARRL

December 10, 1959

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