July 1954
40 Cents
45c in Canada

QST

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amateur radio

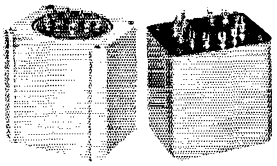
CLIPPERTON AT LAST!

(A first-hand report on DX-pedition FO8AJ appears in this issue)

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

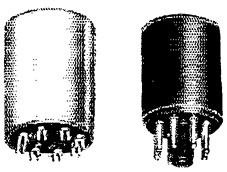
TRANSFORMERS
REACTORS · FILTERS

HIGHEST FIDELITY

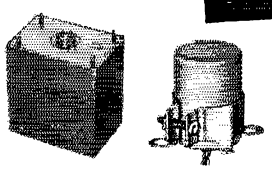


Linear Standard — Hipermalloy

COMPACT

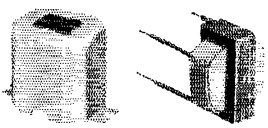


Ouncer — Plug-In



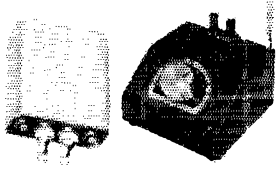
Magnetic Amplifiers — Multi-Shielded Inputs

AMATEUR MINIATURE

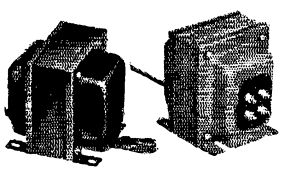


Special Series — Sub-Ouncer

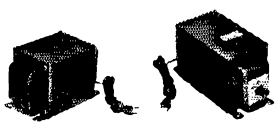
HI-Q TOROIDS



Inductors — Decades

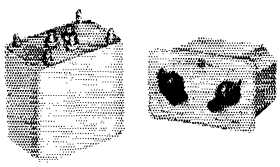


Replacement — Signaling and Control



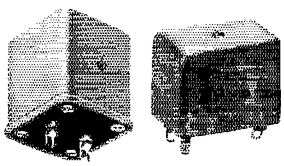
Stepdown — Line Adjustors

CONTROLLED RESPONSE



Filters — Equalizers

VARIABLE INDUCTORS



Non-Hermetic — Hermetic

RUGGED . . . INDUSTRIAL

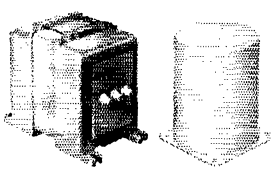
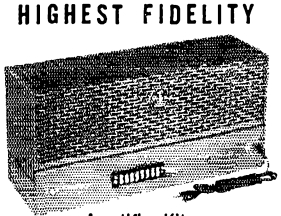


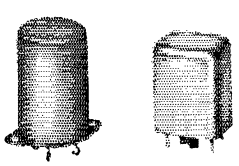
Plate — Audio

HIGHEST FIDELITY

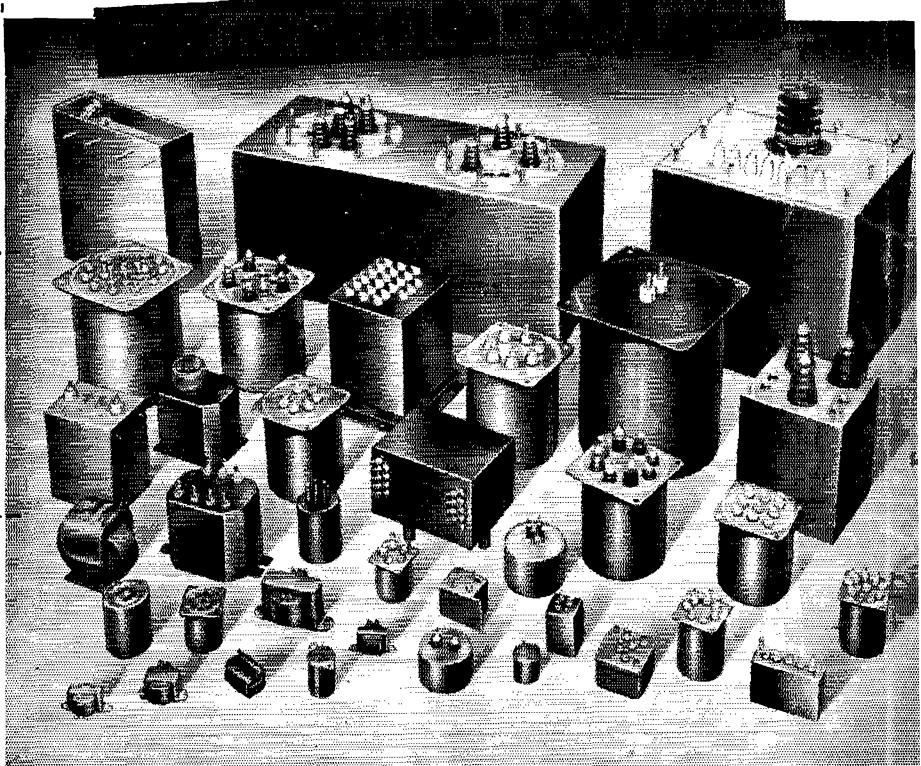


Amplifier Kit

HERMETIC . . . MIL-T-27



Audios — Pulse Units



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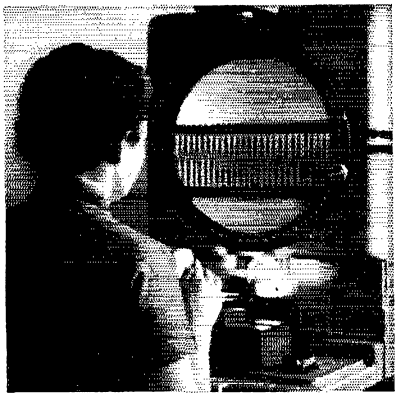
Ask for the extra that ***costs you no more . . .***

G-E INSURED TUBE QUALITY!*

*** Quality insured by G.E.'s multi-million-dollar investment in the world's most advanced tube manufacturing and test facilities.**

MATERIALS CHECKING. Special optical instruments are used to check surfaces of G-E tube parts. In addition, metallurgical and chemical tests analyze content, to determine whether materials meet specifications. G-E tube components must bear laboratory okays for quality.



MANUFACTURING INSPECTION. The comparator shown here magnifies a G-E tube grid some 50 times, so that the wire winding—finer than a human hair—can be accurately checked. Similar highly-developed optical equipment at all stages, makes inspection of tube parts easy and virtually mistake-proof.

● G-E tube facilities include seven large factories in different cities, totaling more square feet of production space than used by any other manufacturer. Facilities include hundreds of intricate machines for high-precision quantity output, many of them G-E-designed . . . also advanced equipment like that shown on this page, for raw-materials analysis, manufacturing inspection, and final tube testing.

Insist on G-E Insured tube quality*! See your G-E tube distributor for amateur tubes that are better-built because unequaled G-E resources stand behind them! *Tube Department, General Electric Company, Schenectady 5, New York.*

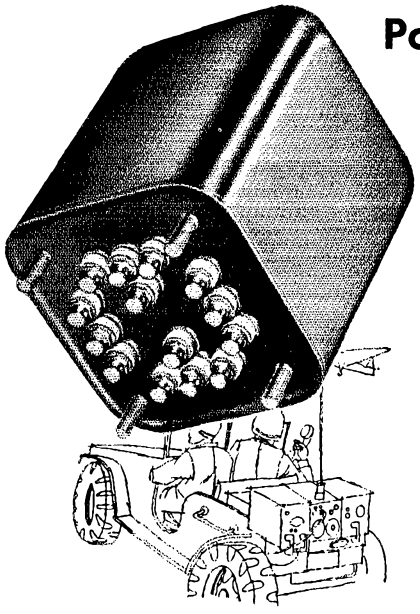
COMING in September, on this page: terms of the 1954 Edison Radio Amateur Award. Get ready now to nominate an amateur you believe to be qualified, by reason of some outstanding public service!

TUBE TESTING. Before tubes are shipped, a comprehensive final test! Instrument dials tell a scientific story of electrical performance. Tubes that don't "make good" are scrapped. When you take a G-E tube from its carton, you know it will serve you long and well.

GENERAL ELECTRIC

166-184

CHICAGO offers the complete MS (MILITARY STANDARD) Line of Hermetically Sealed Power and Filament Transformers



★ *for military communications*
★ *research and development*
★ *pilot runs* ★ *pre-production models*

These CHICAGO transformers meet all specifications of the Military Standard line of transformers developed jointly by the Army Signal Corps, Navy Bureau of Ships and the Air Force working through ASESA (Armed Services Electronic Standards Agency).

The entire CHICAGO MS line has been designed to conform with MIL-T-27, Grade 1 specifications for Class A operation. All units are housed in CHICAGO'S one-piece, drawn-steel cases whose dimensions and mounting centers are within the tolerances of the Military Standard specifications.

POWER TRANSFORMERS—INPUT REACTOR SYSTEMS (PRIMARY—105/115/125 V.—Frequency 54-66 cycles)

CATALOG NUMBER	MIL-T-27 PART NO.	HIGH VOLTAGE A-C Volts	SECONDARY D-C MA.	D-C V OUTPUT	RECT. FIL. Volts	RECT. FIL. Amps.	FIL. NO. 2 Volts	FIL. NO. 2 Amps.	WT. LBS.
PMS-70	MS-90026	200-100-0-100-200	70	385	6.3/5	2	6.3	3	4
PMS-70A	MS-90027	325-0-325	70	260	6.3/5	2	6.3	4	5
PMS-150	MS-90028	325-0-325	150	245	6.3	5	5	3	7¼
PMS-175	MS-90029	400-0-400	175	318	5	3	6.3	8	10
PMS-250	MS-90030	450-0-450	250	345	5	3	6.3	8	13
PMS-350	MS-90031	350-0-350	250	255					7½
PMS-550	MS-90032	550-0-550	250	419					11
PMS-800	MS-90036	800-0-800	250	640					16½

FILAMENT TRANSFORMERS (PRIMARY—105/115/125 V.—Frequency 54-66 cycles)

CATALOG NUMBER	MIL-T-27 PART NO.	SECONDARY Volts	SECONDARY Amps	INSULATION VOLTS RMS	WT. LBS.
FMS-23	MS-90016	2.5	3.0	2500	1½
FMS-210	MS-90017	2.5	10	2500	2½
FMS-53	MS-90018	5.0	3.0	2500	1¾
FMS-510	MS-90019	5.0	10	2500	4
FMS-62	MS-90020	6.3	2.0	2500	1¾
FMS-65	MS-90021	6.3	5.0	2500	2¾
FMS-610	MS-90022	6.3	10	2500	5
FMS-620	MS-90023	6.3	20	2500	8
FMS-210H	MS-90024	2.5	10	10000	4¾
FMS-510H	MS-90025	5.0	10	10000	7

FREE
New Equipment Catalog
Chicago's new Catalog CT153—lists complete specifications on the entire line of famous "Sealed-in-Steel" Transformers. Write for a copy today, or get it from your electronic parts distributor.

CHICAGO STANDARD TRANSFORMER CORPORATION
3501 W. Addison St., Chicago 18, Ill.

QST

JULY 1954

VOLUME XXXVIII • NUMBER 7

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38 La Salle Road
West Hartford 7, Connecticut
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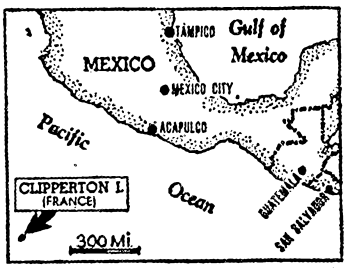
INDEXED BY
INDUSTRIAL ARTS INDEX

—CONTENTS—

Clipperton

Chicago Daily Tribune F** Fri., March 19, 1954

5 IOWANS HEAD FOR PACIFIC IN RADIO HAM TEST



Newton, Ia., March 18 [Special]—Five radio hams left Newton today for an uninhabitated coral atoll in the Pacific from which they will try to contact as many as possible of the world's 230,000 licensed radio amateurs.

The unique expedition was financed by contributions from radio hams all over the country, by the five participants, and by the Hallicrafters company of Chicago, which is lending the necessary equipment.

The island on which they will be located will qualify as "a new country" in the rivalry among hams who try to excel each other in establishing contact with the most foreign countries.

The atoll is French owned. [illegible] square miles and is [illegible] island.

amateur radio station. They expect to drive the 2,200 miles to Acapulco in three or four days, where they will load their equipment aboard a chartered 83 foot motor vessel for the trip to the atoll.

Use All Wave Bands

The group is comprised of Robert Denniston, a Newton building supply dealer; two employes at his lumber yard, Tom Partridge and Vern Hedman; Gene O'Leary, who operates a radio and television shop here, and Leo Olney, who has a television service in Des Moines.

At the end of the experiment all radio hams who contacted the "new country" will receive confirmation cards mailed by the Hallicrafters company. The group on the atoll will operate on all wave bands—160, [illegible] 15, and 10 meters. [illegible] are

Chicago Daily Tribune
Saturday, April 3, 1954
Part 1—Page 4 F**

SEXTANT LOST SO 'HAMS' CAN FIND THEIR IS

Five radio amateurs wh
Newton, Ia., March 18
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South Pacific, 650 mil
of Acapulco, Mexico,
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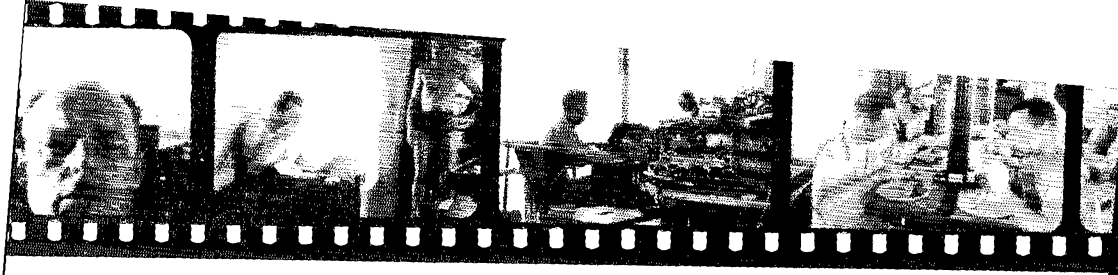
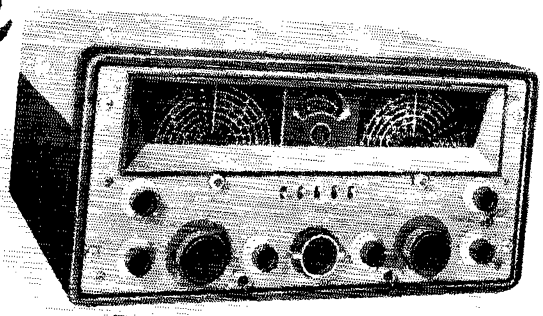
and tried to g



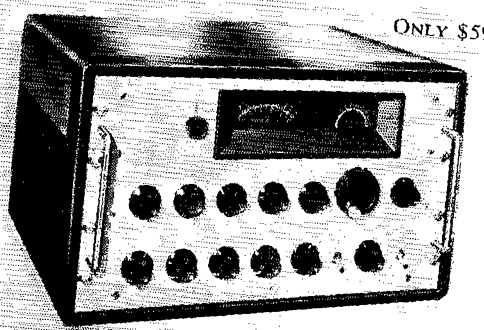
FO8AJ

Adventure



THIS RECEIVER WENT TO CLIPPERTON. Hallicrafters SX-88, the most wanted piece of ham equipment in years. Exclusive sensitivity from 10 Kc to 250 cycles in 6 steps. 1108 contacts on Clipperton from 28 countries—5 continents.

ONLY $595.00.



HERE'S THE TRANSMITTER THAT WENT TO CLIPPERTON. TVI Suppressed 100 Watter. Hallicrafters HT20. Continuous coverage from 1.7 Mc to 30 Mc—full band switching. Choice of 10 crystals. Shielded, filtered r-f compartment plus low-pass 52 ohm coaxial line output filter cuts anything over 30 Mc.

ONLY $449.50.

hicago Daily Tribune
Saturday, April. 24, 1954

IOWA RADIO 'HAMS' REACH DESTINATION, UNINHABITED ISLE

Five radio amateurs who left Newton, Ia., March 18 reached the uninhabited island of Clipperton in the Pacific ocean yesterday, and reported their arrival to radio "hams" of the Chicago area.

The group reached Clipperton island, 600 miles southwest of Acapulco, Mexico, after a hazardous voyage in which they lost their sextant, then had their schooner virtually disabled thru loss of sails in a squall and mechanical troubles, and finally got caught in the Humboldt current and drifted 90 miles from the island.

The Hallicrafters company of Chicago said the group reported it was towed to the is- Mexican coast guard

Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **All ARRL Field Organization appointments** are now available to qualified League members. These include ORS, OES, OPS, OO and OBS. Also, where vacancies exist SCMs desire applications for SEC, EC, RM and PAM. In addition to station and leadership appointments for Members, *all amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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Eastern Pennsylvania	W3BIP	W. H. Wiand	P.O. Box 143	Pottstown
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Louisiana	W5FMO	Thomas J. Morgavi	3421 Beaulieu St.	New Orleans 20
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Tennessee	W4SCF	Harry C. Simpson	1863 So. Wellington St.	Memphis
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N. Y. C. & Long Island	W2VBT	Carleton L. Coleman	117 Harvard St.	Williston Park, L. I.
Northern New Jersey	W2VQR	Lloyd H. Manamon	410½ Fifth Ave.	Asbury Park
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Kansas	WØICV	Earl N. Johnston	624 Roosevelt	Topeka
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Western Massachusetts	W1JYH	Roger E. Corey	67 West Allen Ridge Road	Springfield
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South Carolina	W4ANK	T. Hunter Wood	1702 North Rhett Ave.	North Charleston
Virginia	W4KX	John Carl Morgan	Merrimans Lane	Winchester
West Virginia	W8PQQ	Albert H. Hix	1013 Belmont St.	Forest Hills, Charleston 4
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Western Florida	W4MS	Edward J. Collins	1003 E. Blount St.	Pensacola
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West Indies (Cuba-P.R.-V.I.)	KP4DJ	William Werner	563 Ramon Llovet	Urb. Truman, Rio Piedras, P. R.
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SOUTHWESTERN DIVISION				
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Arizona	W7LVR	Albert Steinbrecher	RFD 5, Box 237	Tucson
San Diego	W6LRU	Don Stansifer	4427 Pescadero	San Diego 7
Santa Barbara	W6IOX	Vincent J. Haggerty	1017 Indio Muerto St.	Santa Barbara
WEST GULF DIVISION				
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Southern Texas	W5FJF	Dr. Charles Fermaglich	618 Medical Arts Bldg.	Houston 2
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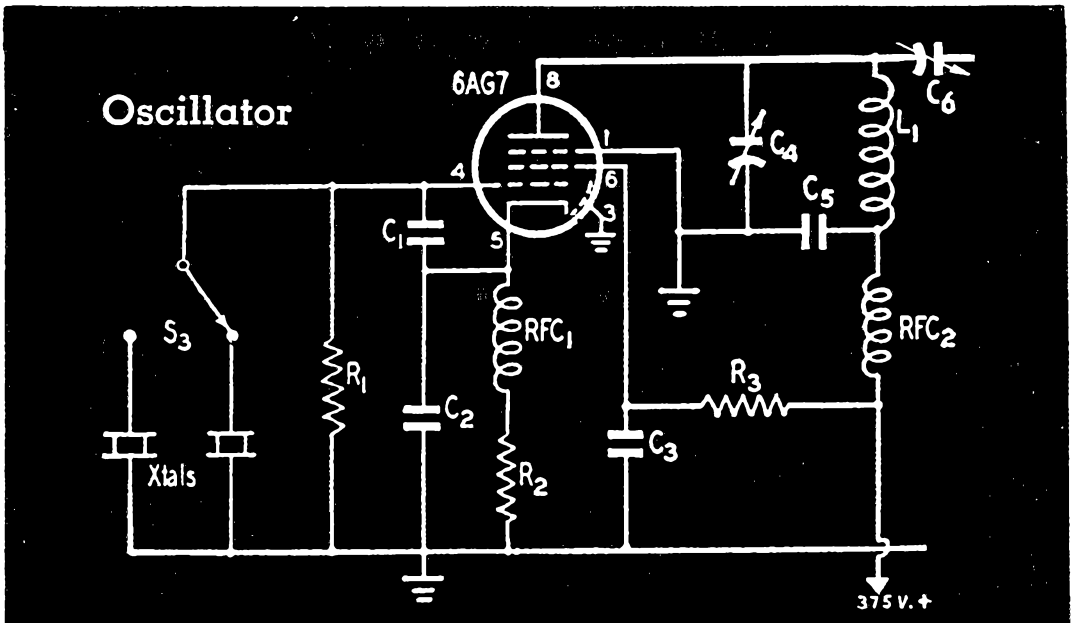
Ontario	VE3IA	G. Eric Farquhar	16 Emerald Crescent	Burlington, Ont.
Quebec	VE2GL	Gordon A. Lynn	R.R. No. 1	Ste. Genevieve de Pierrefonds, P. Q.
Alberta	VE6MJ	Sydney T. Jones	10706–57th Ave.	Edmonton, Alta.
British Columbia	VE7JT	Peter McIntyre	981 West 26th Ave.	Vancouver, B. C.
Yukon				
Manitoba	VE4LC	Leonard E. Cuff	286 Rutland St.	St. James
Saskatchewan	VE5HR	Harold R. Horn	1044 King St.	Saskatoon

* Official appointed to act temporarily in the absence of a regular official.



C1—15-uufd. mica
C2—50-uufd. mica
C3—0.002-ufd. mica
C4—100-uufd. variable
C5—500-uufd. mica
C6—7 to 35-uufd. variable
R1—68,000 ohms, ½ watt
R2—500 ohms, 1 watt
R3—47,000 ohms, 1 watt
RFC1, 2—2.5-mh. choke
S3—S.p.d.t. snap switch
L1—(see text below)

FOUR BAND COVERAGE with ONE PR Crystal!

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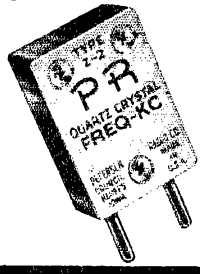

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. 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.

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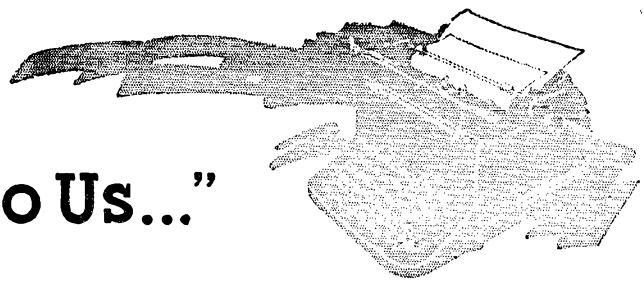


"It Seems to Us..."

MAIL EXAM PRACTICES

On this page last month we began discussing the new mail examination procedures and became so wound up in our moral responsibilities that the Managing Editor had to blue-pencil a "30" across the middle of our copy, indicating we had more than filled the page. So let's continue. . . .

The wholesale change in exam procedures, whereunder a large majority of all exams will now be conducted by us amateurs instead of by FCC engineers, poses us some problems which are practical as well as moral. Up to now, all ham aspirants within the old 125-mile radius knew they had to apply in person, got the exam schedule and FCC office address from their *License Manual* study, had no doubts as to the exact procedure to follow. Now, for Novice and Technician applicants, the entire country becomes a mail examination area. A great many thousand future applicants, formerly secure in the knowledge that FCC was giving exams at such-and-such a nearby place, are now cast adrift. Our *Manual* won't tell 'em who, locally, might become their examiner. As the procedures are new, they may not know of anyone nearby who will help them.

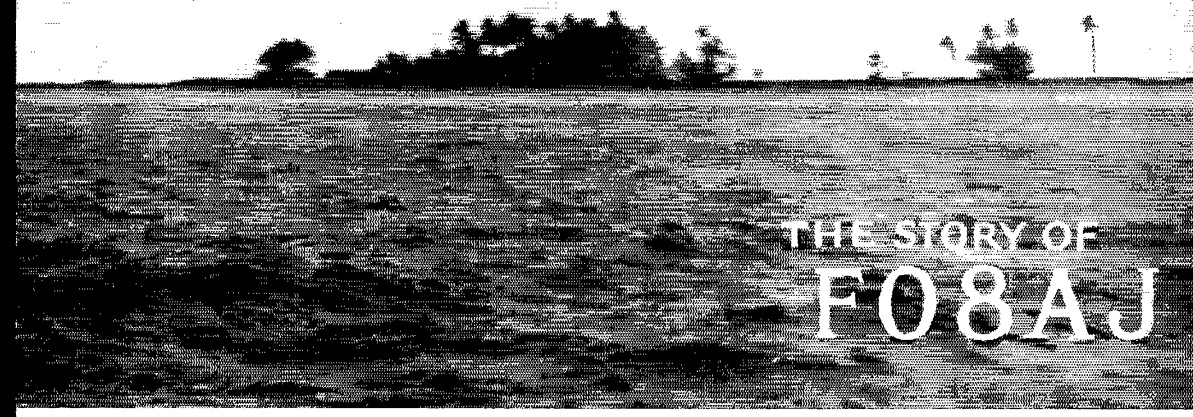
It seems logical at this point that what we need is an established procedure for each local community that will become generally known in ham ranks and among ham aspirants. It is equally obvious, we think, that affiliated clubs are in an ideal position to perform this service. There is no city where FCC formerly conducted Novice and Technician exams that does not have at least one ARRL club. A great many already have code and theory training classes; the perfect follow-up now is carrying through a scheme for the conduct of exams. Perhaps each club will want to designate a committee of qualified amateurs to take on the job. Adequate publicity, locally, will get the word around so that every ham aspirant will learn of the availability of this help. The most powerful argument in favor, it seems to us, would be the uniformity of standards and procedures existing if several capable local amateurs were designated as qualified examiners. In no way we can think of would uniformity be better maintained. And uniformity should be a primary goal in this job which FCC has tossed to us.

While we're at it, we'd like to pass along an idea which has been staring us in the face but which we didn't see until a suggestion from W3UZB brought it into focus: the use of W1AW code practice transmissions for the code-receiving portion of the exam. The mail examination requires that the applicant pass a code test in sending and receiving at the prescribed rate, so certified by the examiner. No details are prescribed concerning text to be sent, type of equipment to be used, etc. To quote UZB, why not "have the applicant come to the officiating ham station and copy W1AW at 5 or 13 w.p.m. on the appropriate nights." The code is machine-sent, so there can be no question of actual speed or quality of sending; the letter spacing at the slow speeds closely follows FCC standards in their own tapes. For the receiving portion of the test, then, W1AW is ideal. Of course you run the risk of bad conditions or interference a particular evening, but that shouldn't happen often; and W6JZ and W6OWP transmissions are equally suitable for West Coast use.

Lest someone point out that *QST* often carries, in advance, references to text sources of practice material, we'd like to express doubt that an applicant could memorize several thousand words of text in advance — particularly when at the lower speeds the words are often sent in reverse order! Further, there are many nights when unannounced copy is transmitted. For the master text, the examiner should copy simultaneously rather than use the *QST* reference, inasmuch as occasionally certain punctuation or odd words are altered when cut on the tape. It seems to us an ideal system for getting perfectly-sent code at the exact speed and we recommend it for examination purposes. It is available every night of the year.

But back to clubs. We again urge all ARRL clubs, particularly in those new areas where Novice and Technician exams are now available by mail only, to set up procedures making it convenient for newcomers to join the ranks of licensees. It is a service typical of those which the fraternity of amateur radio provides in taking care of its own needs. It will maintain uniformity of standards. Not incidentally, it is an incentive to membership in the local club and therefore to participation in the organized body of amateurs.

DXpedition to Clipperton . . .



BY ROBERT W. DENNISTON,* WØNWX, EX-W4NNN

HAVING never fully recovered from the pleasure of being rare DX while on a sojourn at VP7NG[1] during the 1948 ARRL DX Contest, I have suffered recurring attacks of *DXpeditionitis*. About a year ago this chronic affliction got the better of me and I began working seriously at putting Clipperton Island (FO8) on the ham bands.

Research soon disclosed why this spot had seen little activity. Advisory reports from anxious and sympathetic fellow-DXers said:

. . . There's no harbor and a terrific surf sometimes covers the whole island.

. . . Beware of the wild pigs with tusks that drive men into the surf.

. . . Clipperton is surrounded by coral reefs that slash men's shoes to shreds.

. . . Man-eating sharks abound about the atoll.

. . . Be prepared to swim the last 50 feet and climb the 4-foot precipice with your equipment as a boat cannot be run up to shore — others who tried lost their gear.

These voluntary reports were discouraging; but to a ham with *DXpeditionitis* they were equally challenging.

F9AA, REF president, had been very helpful and had interceded on my behalf with the French Government in Paris and Tahiti (the latter has jurisdiction over Clipperton). As a result, I was authorized to visit that French oceanic territory as FO8AJ. With some misgiving it was decided to give the trip a try.

The first target date was November, 1953. An SWL friend, Vern Hedman, volunteered to go along, but a suitable ship for charter could not be found anywhere on the Mexican west coast. After months of searching an 83-ft. twin-diesel, the *Sea Rider*, was located and made available by the Hallicrafters Co.

Letters addressed by members of the Newton (Iowa) Radio Club to DXCC members in the U. S., possessions and Canada, soliciting funds to help pay other expedition expenses, brought gratifying returns. To all those kindred spirits who contributed to the project, an S9 *thanks very much!*

The last problem — transporting radio gear across Mexico — was solved by XE1H who got us the necessary permit.

Meanwhile much valuable information on Clipperton had been coming in. KV4AA sent pictures of the island taken by tuna fisherman W6UXX. Subsequent schedules with W6UXX and W6KYG

* Post Office Box 709, Newton, Iowa.

[1] "Expedition 'Gon-Waki'," Denniston, July 1948 *QST*.

• A most famous mountaineer, when asked why he burned with a desire to climb a particularly frustrating peak, replied simply: "Because it is there." Clipperton Island, too, is there. It is also "there" on the ARRL DXCC Countries List. Like the weather, all DXers have talked about Clipperton — here is the first-hand account of what a party of hardy amateurs and their friends *did* about it.

gave other good dope, including the address of K2BBZ, who had been on Clipperton in 1945 while serving Uncle Sam. Bob provided volumes of information, photographs, and answered countless questions for the landlubbers from Iowa. He drew sketches showing the contour of the Pacific bottom and how to land around the stern of a beached *LST*, using its hulk as a breakwater.

This time the expedition was planned — we hoped — to be on the air for the last week end of ARRL's 20th International DX Competition plus an extra day after the fray. Numerous friends were contacted as to joining us. Those deciding to go, besides Vern, were Leo Olney, WØNUC, Gene O'Leary, WØVDQ, and Tom Partridge.

Replacing the rear seats in Leo's stationwagon were an HT-20, HT-18, SX-88, and a gasoline-driven generator loaned by the Winpower Mfg. Co. A mattress over the crates completed our rolling "hotel room." Towed behind was a trailer with identical equipment.

We started at a fast clip for Acapulco, Mexico, in the wee hours. At San Antonio, Texas, the tongue of our overloaded trailer broke off. Luckily we then were traveling about 10 m.p.h., so there was no damage to the equipment. After repairs, and extended stops in Oklahoma, at Customs in Nuevo Laredo, and while visiting XE1N, LMRE president, and XE1H, a general in the Mexican Air Force, we arrived in beautiful Acapulco four and one-half days after leaving Iowa.

Two days later, after an expensive bout with Customs, we loaded our gear on the *Sea Rider* with the help of the seven crew members and numerous onlookers.

The second evening out, in rough seas, the navigator tripped over an exciter while going to take some star sights; he dropped the sextant, breaking one of the mirrors. The next morning we learned the sad news that he could not use it again until it had been sent ashore for repairs, and that he did not feel the radio direction finder aboard would be of help. Since we now had no way of navigating, and had never been able to raise anyone on the ship-to-shore radio, we fired up FO8AJ/MM on 20 and asked Charlie, W1FH, to telephone friend Vic, W4KFC, to see if FCC would give us position reports. Within moments we were transmitting for FCC to take a "fix" on our signal. It was felt that if this method of navigation worked we would have a good chance of finding Clipperton. W6DI offered to relay information from FCC, an arrangement which worked out very well because of Guy's untiring efforts and potent signal. The "fixes" turned out to be quite accurate (within 40 miles) for the distance involved, so we decided to try the remaining 250 miles to Clipperton.

As we arrived in the vicinity of the island we

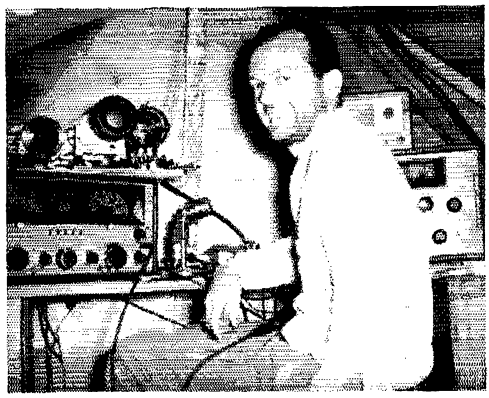
began to sight many birds. From the highest point on our ship we could see a dozen miles, but with many pairs of eyes straining through binoculars we were unable to sight it by nightfall.

It seemed we had run into a streak of bad luck (which was destined to last for some six weeks). Al Guiberson of Dallas, owner of the *Sea Rider* and an ex-spark-gapper, suggested via W5DMR that we shut down the engines to save fuel, drift during the night, and try to contact a ship to get fuel. But with the engines stopped the craft pitched and rolled so badly fuel drums lashed on deck threatened to break loose. To prevent damage it was necessary to restart the diesels. It was then that our navigator (and captain) decided to turn back to mainland. By now morale was very low; frequent seasickness did not help.

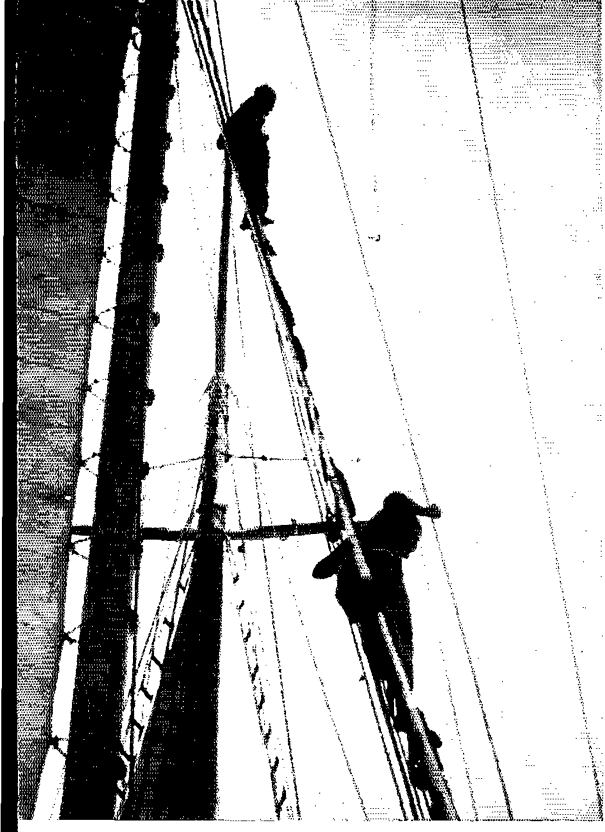
Subsequently it occurred to all five of us that we should try again. Since Acapulco would be 2400 miles from home it seemed better to try again to make the last 772 miles to Clipperton while we were already in southern latitudes. After hearing of our straits, DXers went to work raising additional funds, looking for flying boats, etc.

A week at sea had made us appreciate the steadiness of dry land. Once ashore we lost no time in heading for a big steak.

I flew to Mexico City where XE1H, XE1N and XE1GL took me to see a Mexican naval official about the possibility of a second attempt at going to Clipperton on a Navy ship or flying boat. He



The author inside the FO8AJ tent shack during a not-too-busy period.



Left: Leo (top) and Tom sight for Clipperton from the *Barca* rigging. *Above:* The *G-38* prepares to take the *Barca* in tow.

agreed it was a good idea except that it would probably take a month to get official clearance from France for a Mexican vessel to go to the island. Since both countries claimed the "Isle of Passion" for seventy-four years until the King of Italy (as arbitrator) awarded it to France, it did seem unwise for the Mexican Navy to land there unannounced. A deal with the ham pilot of a privately owned Catalina flying boat fell through when the owner decided to sell it to the Navy.

Back in Acapulco the Port's chief pilot suggested the *Barca de Oro II* as a possibility. The owner, Captain Braun, showed us the ship and said he would like to make the trip. It was an 83-ft. schooner with auxiliary diesel. It looked good.

The Hallicrafters Co. and North American Philips Co. generously arranged for the charter. All that remained was once more to obtain provisions, water, landing boats, etc. Tony Rivas, owner of Hotel La Riviera where we were staying, and Toby Dorantes, experienced in dugouts and surf landings, joined our party for this second venture.

Three days later, after the usual haggle with Customs, we loaded and were ready to shove off with thirteen men aboard. Difficulty with the ship's generator developed, delaying our departure for a couple of hours (a preview of more tough luck to come?).

The next five days at sea we battled oil- and water-line leaks, thunderstorms, torn sails, leaky hull, a dead battery in the ship's 32-volt system, and generator-starting trouble. All aboard the *Barca* — party and crew — pitched in to lick the breakdowns.

The sixth day out Leo spotted Clipperton Rock from high on one of the 70-ft. masts. Captain Braun had done an excellent job of navigating, as we were headed right for the atoll. When we got to within about five miles of the island it was getting dark so the captain decided to stand by until daybreak.

But by morning FO8-land had disappeared from view. An easterly wind had been carrying us westward and because of the shortage of sails it was impossible to tack into the wind. We tried to head toward the island but the engine quit again with a storm approaching. The wind got up to 40 m.p.h., and at times waves came over the bow. Through it all our generator on deck kept running and it was a secure feeling to have ham radio contact with W6DI and the rest of the U. S. A. and Mexico from our "shack" below decks.

The wind blew for several days and the sky remained overcast, making it impossible to shoot the sun or stars. XE1QB and XE1SA gave us weather reports from XE4PK at Socorro Island, north of us, where the storm had also hit.

The *Barca's* diesel had been stopped for some time because water was mixing with the crankcase oil. W6YRA, at UCLA, learned about it and called in a University specialist who went back to his lab, met us on schedule later, and correctly diagnosed our difficulty: a plug in the drain hole of the water pump.

When the sky cleared Captain Braun shot the sun several times but readings were unreliable (this was the day of the year when the sun was directly overhead). (How long can a bad-luck streak last?) The next day more accurate readings showed us to be 98 miles from Clipperton. A defunct water pump again made it necessary to stop the engine.

By now our spirits were again beginning to get mighty low. The thing that cheered us most was talking via FO8AJ/MM to our families back home. Sparkplugging these operations in our

Site of FO8AJ on the edge of the fresh-water lagoon. Famed Clipperton Rock is in the background.

Vern and Gene take time out for chow in a setting of abandoned military craft.

Iowa home towns were WØWML and WØWIJ. In Acapulco members of the ham club, XE3BB, XE3BM, and Mr. Navarro (who kept us supplied with weather reports and otherwise assisted in important ways), provided home contacts for the Acapulcans in our party. XE3BL and XE3BV also had been very helpful to us when we were on the shore.

From W6DI we learned that a 4-knot current going past Clipperton was what was causing us to drift westward. With our last sail torn and the engine dead, it seemed time to request assistance. Rescue units in the Canal Zone, Costa Rica, Acapulco, Mexico City, Corpus Christi and San Diego, alerted by near-by amateurs, offered to come to our aid or stand by. Thanks to friends in Mexico City, who told of our plight, the Mexican Navy decided to send three ships.

While waiting for help to arrive the *Barca's* engineer took a drain pump from the galley sink and attached it to the diesel engine. Now we had tried everything, including the kitchen sink! By using a different batch of lubricant that was only one-third water, and by adding rain water to the radiator, we were able to run toward Clipperton at moderate speed for about ten hours. But soon the lubricant became so thin the oil pressure was practically nil. Again we were drifting westward, engine stopped.

The next day we made radio contact with the Mexican Navy's *G-38* and at 3:45 P.M. sighted it from the mast . . . a most welcome sight! At 5 P.M. she reached us and several officers came aboard, including a doctor and a mechanic. They also brought lubricating oil and food. This last item had become mighty important — we were now on a steady diet of beans and tortillas. At 6:45 P.M. the *G-38* took us in tow for Clipperton.

A refreshing night's sleep brought us to a point where we could see the island. Both ships anchored about 600 feet from the beached *LST* and we lowered a heavy dugout over the side. Gene, Toby and David started ashore in the canoe, a conveyance reputed to be good in the surf; however, a breaker capsized it about 50 feet from shore. The boys stood in water up to their armpits, then made a hasty dash for shore — Gene had felt something brush his leg.

With Gene staying ashore, Toby and David made a return trip to the *Barca*. But before they could start they spent several minutes scaring a baby shark away from the beach. At this point in our landing operation a second ship arrived, the *Thomas Marin* from Mazatlan.

Now came the big gamble. The canoe hadn't looked so good so into a rubber raft went a complete ham station in watertight plywood boxes, along with water bottle, tent, guns, cameras, Tom, Vern, Juan and myself. (Leo stayed aboard the *Barca* to maintain communication with the outside world while we set up the station.) All gear on the raft was lashed down so that after the "upset" it would come to the beach together. After reaching a point to windward of the *LST* we aimed for the stern and started through the breakers. Picking up speed we passed the big craft and then, paddling frantically — while doing no little arguing and shouting on the side about who should be paddling hardest in order to turn the raft in the right direction — we managed to get into the protected area between the *LST* and shore. Gene waded out to meet us and we made a perfect landing on smooth sandy beach without shipping a drop of water. The spot was just as K2BBZ had described it — no rocks and moderate surf.

Operation continued right up to the last moment. L. to r.: WØVDQ, WØNWX, WØNUC and Vern Hedman.

Tom nails an Iowa call-letter license plate above a sign left by a ship in 1953.

A bit of recuperation came next while we sat on the beach and ate coconuts. Then we carried our gear past the rusty remains of amphibious tanks, landing craft and ammunition (left from W.W. II practice landings) to a spot near the lagoon. Here we set up our tent. A 20-meter quarter-wave vertical on a fish pole was erected while the equipment was being set up.

Preliminary tests showed that we had made one mistake. The light-weight light-duty generator we took ashore had had some rough treatment including sitting on a wet deck, being connected to the bilge pump and overloaded, running without sufficient ventilation or oil, etc. — it made considerable noise in the receiver.

Our first contact was with W6DI, our constant companion, at 5 P.M. CST April 23rd on 20-meter 'phone. The hash was so bad we could hear very few signals so we worked a bit at getting rid of it without too much luck. Back on, the second QSO was with W6AM, followed by W6SYG, W4TM, W4DQH, W3JNN, W3CTJ, W5KBP. Switching to c.w., KV4AA (who has probably given more hams a new country than anyone in the world) became a "first." Next in line were W3BVN, W3BES, W5LVP, W8FGX, W6MUR, W1TYQ, W6MX, W4HQN. Then came another pause in the interest of hash reduction.

Returning to the receiver I heard pal W8NBK signing so I zeroed him and sent "BK." He replied "BK" and I came back "de FO8AJ." His wary comment was "Who are you kidding?" After several exchanges he finally ventured a signal report. Just then a pig walked nonchalantly by our tent. We grabbed our guns and edged toward him but he took off on the run. Others we saw later did the same.

About 7 P.M. the hash began to quiet down, probably due to the generator drying out, so operation picked up. Gene and I took turns, he on 'phone and I on c.w. By 9 o'clock the noise was gone. Things were looking up!

Meanwhile Tom and Vern had been busy getting the tent in shape for anticipated wind and rain, and had even found enough boards to build a floor. By splicing together several sections they got a 35-ft. pole up in the air near the tent, to support the shack end of a 270-ft. long wire we hoped to erect. Then they climbed the side of the *LST* with the aid of rope they had managed to get hooked to its deck. Just as the last man got to the top the rope broke loose; luckily he caught hold of the ship and avoided a bad fall. The sadly rusted *LST* (a most expensive skyhook) now became the far support for the long wire, which ran northeast.

Twenty went out about midnight so we tuned up on Forty. W6MBD and W5ZHR were first and second on 'phone. On c.w., we were happy to work W9AND for a starter (Wes had given us a lot of info from his recent experiences in Mexico). Next came W9KOK, W5RG, KH6IJ (one of our snappiest contacts).

When we went to Eighty c.w. first up was W6VUP, then W7MZP, W6KFV, W6LVN, W6DFY.

Our best hour came the next morning on Twenty c.w. when a lot of savvy operators throughout the U. S. A. helped me log 91 contacts. Gene had also been knocking them off at a great rate when we were on voice.

Fifteen meters was our next band, W5VIR first, then KV4AA, W6EEK, W6YRA, W6YK. While still on this band at 4 P.M. Saturday the generator's gasoline engine ran out of oil and quit. (This is no streak — this is a permanent state of bad luck!) Gene and Vern took it apart and worked it over, to no avail.

Leo had been stuck on the *Barca* all this time because of the heavy surf, and we had been working him periodically by radio. Now we had to switch over to wigwag, using improvised flags. It was decided that with the surf so high it would be too risky to try to send in the other generator on a raft of barrels lashed together.

During the afternoon the *G-36* arrived from Salina Cruz, bringing food, oil, water, and parts for our ship's engine. These replacements had been rounded up by W6DI and his son, by XE1VA (who was in Los Angeles), and W6GPB and shipped by air to XE1H in Mexico City. Al then got them through Customs at night and put them on the next plane to Acapulco. There Tony's wife and father hired a plane to take the food they had purchased — and the parts — to Salina Cruz, where the *G-36* took them aboard. Really fast service!

It was dark now, and since we were having no luck with the generator I decided to "blinker" Leo by flashlight for suggestions. I fired up my little milliwatt job and called him. In time he answered, using something like a one-watter. We were just getting into a nice QSO when — whammo! — the whole armada climbed on the frequency with their California kw. blinkers and pointed their beams at the beach and me — a new kind of pile-up!

It took many exchanges before I could get

across to them that I wanted to talk to Leo. This may have been because I was using English and they Spanish. Eventually I got to work Leo for suggestions; but still we couldn't get the generator engine to run.

The next morning our captain sent Toby and David ashore in the canoe to tell us that the Mexican Navy ships had orders to leave and that if they left the *Barca* was going with them. Things looked bad. Leo hadn't even been ashore yet.

I wigwagged to the *Barca* that we couldn't leave now because we hadn't contacted enough stations and the surf was too high. Our captain sent a similar message to the C.O. of the Navy ships by semaphore. It was relayed to Mexico City by radio.

Our ship's captain wouldn't let us take a generator ashore while we were waiting for an answer because he didn't want to offend the C.O., so we waited — but not too patiently. Shortly after noon four of the fellows took the rubber raft out to the *Barca*, sneaking through the surf when it wasn't heavy. In a couple of hours the good word came through that we could stay until morning. Once more the raft headed for the *LST*, this time with Leo, Tom, Vern, Gene and the other generator aboard. It was another perfect landing. At 3 P.M. Sunday, April 25th, we were back on the air and happy as larks for a change.

While Leo was getting in his licks operating we got a chance to roam a bit. We inspected the abandoned GI camp and climbed the famed 80-foot Clipperton Rock, where we had to brush the birds away to get to the top. Here we viewed the remains of the lighthouse built many years ago by the ill-fated Mexican colony that lived on the island. On our return Leo was really knocking them off, filling pages and pages in the log.

We kept FO8AJ on the air until the last possible moment while the tent came down around it and gear not in use was carried to the beach. At 9:53 A.M. April 26th we signed off with W6DI and started repacking. We hated to leave because there were so many stations that we hadn't yet contacted.

The surf was really too high to risk trying to get to the *Barca* with all our equipment and five men. However, there was no alternative since we had already detained our benefactors an extra day. Everything was crowded into the raft and tied down. Straddling the outside ring, we started to paddle hard.

As we came out from behind the *LST* a king-sized breaker struck with such force that it bucked most of us off our saddles. By the time it passed we had lost 20 yards and weren't too far from the rocky portion of the beach. The raft had taken water in the process so we were much heavier now. Paddling with a vengeance we gradually pulled out to sea, where travel was easier.

We came up on the lee side of the *Barca* and unloaded, a very difficult operation because our raft was rising and falling about six feet and pounding against the side of the ship. After several close calls we finally got everything and everybody aboard.

The *G-38* and *G-36* had left the day before, leaving the *Thomas Marin*, largest of the three, to watch over us. Our engine was working fine now with the new parts. After a cruise around the island for a farewell look, the *Marin* took us in tow and we headed for the mainland.

Now we could relax. We caught up on our sack drill, read 1951 vintage magazines, and checked the logs. A count showed we had made 1108 contacts from FO8AJ.

On the third day, when we were out of the current, the navy ship turned us loose and escorted us the rest of the way to Acapulco. Two boatloads of friends came out to meet us amid much hornblowing. We went ashore 22 days after leaving port, each about 15 pounds lighter. We had just one thing in mind — food!

After being entertained by the Acapulco Radio Club and at LMRE headquarters in Mexico City, XE1N, XE1H and XE1GL took us to the Navy offices where we thanked the admirals for their aid. We also visited Juan, XE1A/XF1A, that fabulous DX Contest operator. He hopes to be on for the next fray.

A pleasant auto trip — expedited by Customs agent XE2JN — brought us home to Des Moines and Newton and a huge sign reading "Welcome Home Rover Boys." After 9000 miles of roving it was good to be back in Iowa.

I would like to express my heartfelt thanks to all the hams in France, Mexico, French Oceania, Canada, and the U. S. and possessions who helped in so many ways to make the expedition a success, and to the Hallicrafters Co. and the North American Philips Co. who played such a large part. To corrupt a bit of Churchillian prose: "Never have so many done so much for so few."

Last — and most important — a tribute to my loving wife for her patience, assistance, loyalty, and encouragement.

Happy return of the *Barca* to Acapulco. *Front, l. to r.*: WØVDQ, WØNWX, Captain Enrique Braun, Vern Hedman, Toby Dorantes, Tony Rivas. *Rear:* WØNUC and Tom Partridge.

Make Your Own Potted Circuits

Using Casting Resins in the Home Workshop

BY WILLIAM F. BAKER,* AND MARK A. MOYNAHAN, W2ALJ/1

• Ever had occasion to admire a circuit or component "potted" in clear plastic resin? You can do potting yourself, without any special tools or equipment, to miniaturize equipment and protect it from shock and moisture. Easier than baking a cake, says the author, and with better prospects of ultimate success!

PLASTIC materials are daily finding their way into the field of electronics. The recent interest of the electronics industry in the casting of components and circuits in plastics should not be overlooked by the amateur fraternity. Although much of the literature now available indicates processes and equipment that only the research chemist uses, this need not be the case — excellent work can be done by the experimenter in his home workshop, laboratory or kitchen. The new plastic resins (synonym for plastic materials in general) can be used in the home safely, easily, inexpensively and with no equipment other than that found in the ordinary kitchen. The whole process is easier than baking a cake and often quite similar.

Electrical components are embedded in plastic for a number of reasons, but most often for mechanical support. Some of the other reasons are:

1) Resistance to dislocation from shock.
2) Moisture resistance.
3) Insulation.
4) Three-dimensional packaging.
5) Elimination of mountings (bare point-to-point wiring is safe with the insulation supplied by the resins).

Plastic resins are good insulating materials at high frequency and have sufficient dielectric strength for the moderate voltages found in most electronic work. Intricately shaped brackets may be formed to support high-voltage components, such as tank coils, links, plate leads, and r.f. chokes. Quantities of small parts may be cast in a solid block of resin to prevent them from moving or touching when the chassis is jarred.

Another general reason for casting is to protect circuits and components from weather. A tuning coil can be molded into the insulator of an antenna to protect it from the elements. Audio phase-shift networks embedded in resin are impervious to high humidity conditions. Certainly not the least important aspect is the beauty of these components when they are seen in the center of a clear block of plastic. Even a common half-watt resistor will so sparkle that it seems better destined to be an earring or on a charm bracelet!

Resin Properties

The plastic resins used by the authors are, chemically speaking, modified polyester resins specifically formulated for electronic embedment ("Plastronic" PB-25, KB-11). Suppliers of these materials are mentioned at the end of the article. The plastics are supplied as clear or black opaque materials. The clear resin PB-25 is useful where visual inspection is desired. It can be dyed any color. It is excellent for demonstration purposes, has good electrical properties, and machines well. The dielectric strength of the clear material is 500 volts/mil, the power factor is 0.02 at 1 Mc., the dielectric constant is 3.15 at 1 Mc., and the thermal conductivity is 2.0 B.T.U./ft^2/hr/°F/in.

The black opaque material, "Plastronic" KB-11, is a mica filled polyester resin. It shows less tendency to crack, less shrinkage, faster cure time, somewhat better electrical properties

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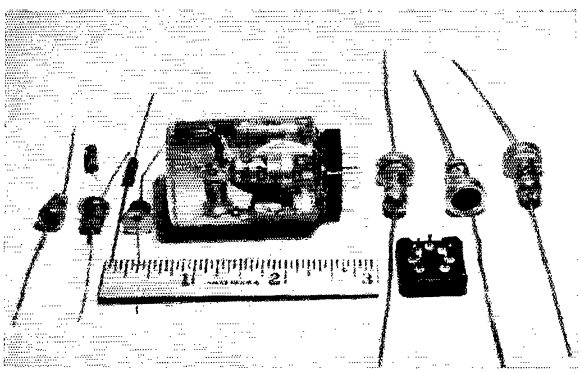


Fig. 1 — An audio phase-shift network for single sideband, potted as described in the text. The molding makes tie points for interconnection unnecessary, thus permitting a compact, moisture-proof assembly on a miniature plug-in base.

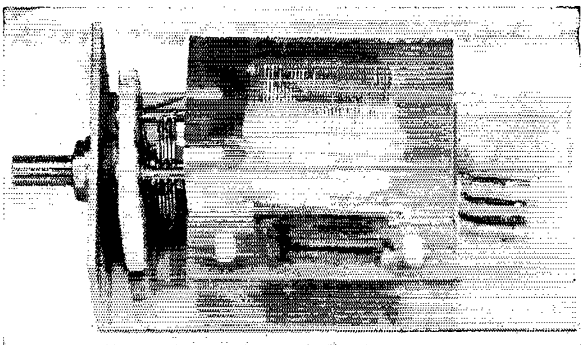


Fig. 2 — Mechanical rigidity for the tuned-circuit coil of a series-tuned VFO is achieved by embedding a length of Miniductor in clear plastic.

and better thermal conductivity than the clear material. The dielectric strength of the material is 750 volts/mil; dielectric constant, 3.9 at 1 Mc.; thermal conductivity, 3.5 B.T.U./ft²/hr/°F/in.

A coil having a *Q* of 243 at 48 Mc. was embedded in this mica-filled plastic with less than 9 per cent drop in *Q*. At 14 Mc. there was no change in *Q*.

A small transformer was embedded in "Plastronic" KB-11 with only the leads protruding through the plastic. It was completely immersed in water at 70 degrees F. for 30 days without any detrimental effects.

Curing

These modified polyester resins are fast-curing, low-viscosity, thermosetting, plastic materials. They are sold as free-flowing viscous liquids which are cured to infusible solids with the addition of a catalyst, promoter and heat. The curing action is exothermic, which means that heat is given off, with the catalyst acting almost as a heat generator. The intensity of the heat liberated in this reaction is dependent upon several factors: (1) amount of catalyst used, (2) amount of promoter used, (3) mass of the casting, (4) oven temperature.

The temperature of the casting often exceeds that of the oven during the curing operation. Successful curing of the plastic resins is dependent upon the control of this reaction. The best procedure is to allow the plastic to reach a solid gel state before curing in the oven. (*Caution:* The casting is very fragile in this condition.) This may take overnight, but the resulting clear castings will be well worth the delay. A slow rate of cure will allow strains developed during the curing operation to distribute themselves throughout the embedment, thus preventing cracking. In going from a liquid to a solid the volumetric shrinkage of the plastic varies from 3.5 to 7.5 per cent, depending upon the type of resin used. This helps in removal of the cured embedment from the mold.

If pressure-sensitive components such as miniature electronic tubes are to be embedded, it is recommended that they be coated with a special pliable coating compound, "Plastronic" PSC, which compensates for the difference in thermal contractions between the glass and plastic.

While the resin will cure at room temperature with the addition of sufficient catalyst, oven cure at approximately 150 degrees F. is more common. This reduces the cure time and less catalyst and promoter are used. One per cent catalyst (based on the weight of the resin) will cause an embedment to cure in about 4 to 5½ hours at room temperature. With the same embedment placed in a warm oven (150 degrees F.) the cure time will be from 20 to 40 minutes. Table I lists the catalyst and promoter concentrations and curing times found by the authors to give best results. Notice that both promoters can be used with the KB-11 mica-filled plastic. The slow action of Promoter B is helpful when a large quantity of plastic is prepared and used up over a period of an hour.

A word of caution about the use of the catalyst and promoter: They should never under any

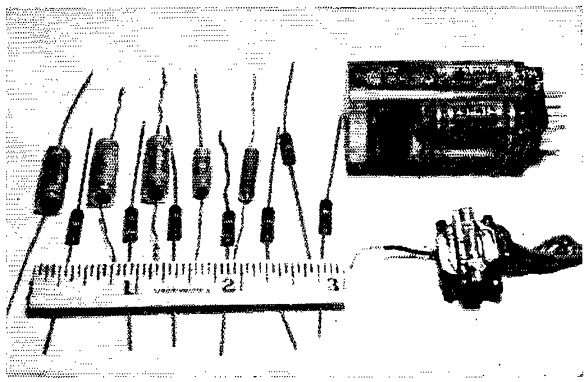


Fig. 3 — A bias power supply molded in cylindrical form with a miniature plug-in base.

circumstances be mixed together. A violent exothermic reaction can develop between these two materials. The catalyst should first be thoroughly mixed into the plastic and then the promoter should be added to this mixture.

The resins have excellent shelf life when stored in cans away from light and in a cool

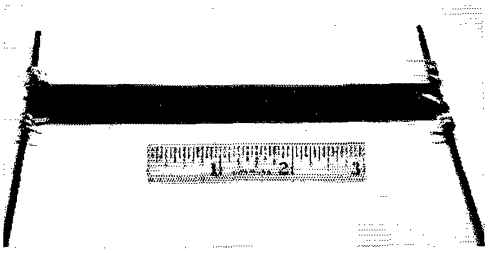


Fig. 4 — Low-loss feeder spreader made from mica-filled plastic resin. These can be made in a flat pan and sliced to size before curing. The cost is less than that of comparable ceramic spreaders.

place. If kept at room temperature they will remain useful for six to eight months; refrigerated, the life expectancy of the resins is better than a year.

Making Castings

Before going to the items the authors made, let us look at some of the types of molds that can be used. Molds can be made from any metal, but good heat conductors are preferred. Aluminum kitchenware and aluminum foil give excellent results. Pyrex dishes, test tubes, and other chemical glassware will also work, providing they are well lubricated with a silicone grease. Even unwaxed paper cups will contain the plastic resin while it is curing. "Flexo-Mold," a liquid plastic which can be cured to form a tough flexible mold, is an excellent material with which to work. A mold made of this rubbery plastic may be used for a dozen or more castings. No lubrication is used since the mold flexes enough for each casting to be removed.

Fig. 1 shows how an audio phase-shift network for a small single-sideband exciter was made into a very compact unit. The components were selected on a bridge so that no adjustments had to be made. After the circuit worked, breadboard style, the parts were soldered to an Alden Products miniature 7-pin plug. Bare wire was used, and everything was jammed into a compact mass, taking care only to leave a minimum clearance of 1/16 inch between parts. A small nameplate stating the characteristics of the unit was mounted so as to be seen through the clear plastic.

In potting units of this general type, anything that will leave about ⅛-inch clearance around the assembly will serve as a mold. The top of an old 6L6 will do fine for cylindrical moldings. Half a cup (4 ounces) of "Plastronic" PB-25 should be prepared with 23 drops of Catalyst B and 25 drops of Promoter B. Lubricate the mold with silicone grease or "mold release" material and with the circuit suspended in it add the plastic very slowly. Try to avoid entrapping any air bubbles among the components. Large castings of clear plastic like this should be oven cured only with the greatest of care. Better let it gel overnight at room temperature before the oven cure. The exothermic reaction will heat it enough to start the reaction without an oven. When gelled, the casting can be placed in a warm oven (150 degrees F.) until it is solid but very slightly tacky to the touch. Remove it from the oven and allow it to cool at room temperature. The tackiness will disappear.

After cooling, the solid casting can be finished with ordinary machine tools and sandpaper. Round castings can be turned down on a lathe, finished with fine sandpaper, and polished on a buffing wheel. Hand polishing can be done with progressively finer grades of sandpaper. The final high luster is obtained by polishing with a mixture of pumice and oil on a cloth and then buffing with white rouge.

Following the same general procedure as outlined above, the authors also embedded in "Plastronic" PB-25 a VFO coil assembly. The circuit was that of the Clapp oscillator, well known for its electrical stability. Mechanical rigidity was obtained very nicely by this embedment. In addition, the circuit was protected from effects of humidity, dust and sudden changes in temperature. The completed unit mounted on the oscillator chassis is shown in Fig. 2. Another item, a bias power supply, was embedded in a similar manner (Fig. 3). The main advantage of embedding here, as in the case of the audio phase-shift network, was in the compact size that could be obtained without danger of short circuits.

One item familiar to amateurs that the authors made from plastic was a quantity of cheap

Fig. 5 — All sorts of shapes can be turned out to meet special needs. The parts shown are representative of special-purpose moldings made by the authors.

feeder spreaders. Any ham who has put up a few hundred feet of open-wire line can testify to the high cost of ceramic feeder spreaders, especially when half of them break from the slightest shock. The plastic spreaders were made from the black, mica filled, "Plastronic" KB-11 (Fig. 4). Two dozen spreaders ½ by ¾ by 6 inches can be made from a pint of plastic. Mix with each pint of KB-11, ¾ teaspoon of

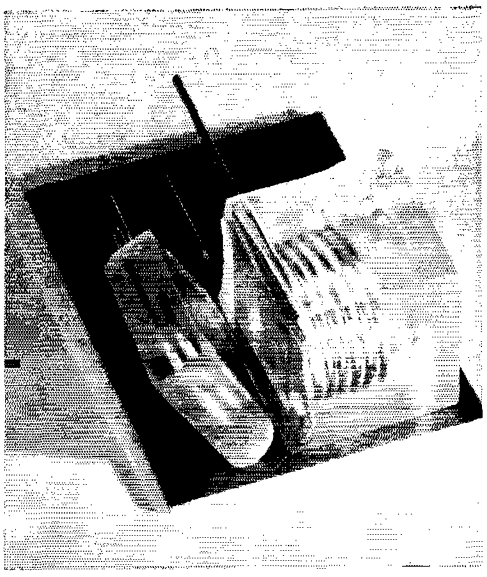


Fig. 6 — Ten-meter tank coil and swinging link, with Faraday shield embedded in the tank-coil casting. Potting permits close spacing of coils and shield without danger of short circuits.

Catalyst B, stir in well, and then add 1¼ teaspoons of Promoter K. Pour this into a 12 × 6-inch pan to a depth of ⅜ inch. After about 30 minutes at room temperature the mass will have gelled enough to allow it to be cut into ½-inch by 6-inch strips. Thin aluminum separators can be put in place to insure complete separation. Put the pan in a warm oven (200 degrees F.) and bake for about 20 minutes. Cool the insulators, separate them, and drill the wire holes in the ends. Total cost is about 9 cents per insulator. These spreaders will be many times more shock resistant and lighter than ceramic ones. They can be dropped from a height of about 12 feet without breaking. Antenna insulators also can be made the same way.

Mica-filled KB-11 can be drilled, sawed, tapped or milled with ordinary machine-shop tools. Drilling should be done at a speed of approximately 1200 r.p.m., feeding the drill into the stock very slowly so as to prevent chipping. When using the lathe, very sharp tools ground to a 10-degree rake give the best results, with fast speeds most desirable.

These plastics are not only useful for making embedments but also make good castings of irregular and close tolerance shapes. KB-11 used in a "Flexo-Mold" mold can turn out small quantities of odd-shaped brackets, panels and insulators quite successfully. Shrinkage (about 2 per cent) must be considered on close-tolerance parts. Fig. 5 shows a variety of items cast from KB-11. Castings made in this way are inexpensive and are relatively simple to produce.

As usual, the problem of cost faces the experimenter, but fortunately it is not a prohibitive

(Continued on page 118)

TABLE I

Material	*Casting Thickness*	*Catalyst B*		*Promoter B*		*Promoter K*		*Gel Time*	*Oven Temp.*		*Oven Cure Time*
		% Wt. of Resin	*Drops per 3 oz. of Resin*	*% Wt. of Resin*	*Drops per 3 oz. of Resin*	*% Wt. of Resin*	*Drops per 3 oz. of Resin*		*F.*	*C.*	
"Plastronic" KB-11 Black Mica Filled	Up to 3 in.	1%	34	1%	42	—	—	3 hrs.	200	94	30 min.
				—	—	1%	40	30 min.	200	94	30 min.
	Over 3 in.	0.5%	17	0.5%	21	—	—	3 hrs.	150	66	30 min.
				—	—	0.5%	20	30 min.	150	66	30 min.
"*Plastronic" PB-25 Clear	Up to ½ in.	1%	34	1%	42	———		1 hr.	150	66	40 min.
	Over ½ in.	0.5%	17	0.5"	21	———		3 hrs.	150	66	40 min.
"Flexo-Mold"	Any Size	———							350	177	Until amber color throughout

* When castings exceed 2 inches at their thickest section, considerable care should be taken to prevent cracking. The oven temperature should be reduced to 100 degrees F. and the casting removed as soon as it is solid but very slightly tacky to the touch.

813s in a High-Power Linear

A Push-Pull Amplifier for S.S.B. Exciters

BY JOHN J. SIMON,* W5SCE

• In the linear operation of a push-pull r.f. amplifier in the range from Class A to Class B, electrical symmetry is of utmost importance, yet by no means easily obtained. The rather unusual constructional design of the high-power amplifier described in this article results in good mechanical symmetry — a basic requisite in achieving electrical balance.

THE push-pull 813 linear amplifier shown in the photographs was designed to fulfill a desire for an s.s.b. final that would handle the maximum permissible input, and be driven by a Central Electronics 10A exciter or its equivalent. The circuit, shown in Fig. 1, is quite conventional, except for the use of the National MB-40SL multiband tuner in the grid circuit. This tuner was selected in order to have a well-shielded well-balanced all-band grid circuit, and to avoid coil changing or switching.

The 813 was chosen not only for its rugged construction and relatively low cost, but also, more important, to avoid the 3000 to 5000 volts used with most other high-power tetrode amplifiers. The chokes L_3 and L_4, wound directly in the plate leads, in conjunction with L_1 and L_2 in the grid leads, eliminated all traces of v.h.f. parasitic oscillation. The combination of RFC_1 and the 1000-ohm resistor in the bias lead similarly takes care of any low frequency parasitic. The amplifier is neutralized by C_1 and C_2 whose construction is described later. It is believed that the individual filament transformers help in maintaining circuit balance. A 10-amp rating is conservative.

Construction

The amplifier is built on a 17 × 13 × 4-inch aluminum chassis. The tank condenser is fastened directly to the chassis, along the rear. The jack bar for the tank coil, elevated on ceramic pillars, is placed immediately in front of the tank condenser. The tubes are mounted symmetrically in front of the tank coil, and their sockets are sub-mounted to bring the internal shields level with the chassis. This is not only a good precaution in minimizing external feed-back, but it also provides space for mounting meters on the panel without increasing the over-all height of the unit, as will be explained later.

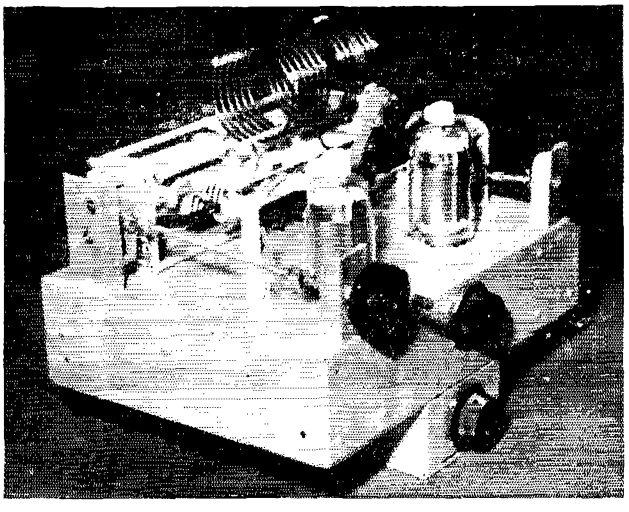
Both the tank-condenser and the variable-link shafts are driven from the panel controls by means of right-angle gear drives. Those shown were taken from surplus equipment, but National or Millen equivalents should be equally satisfactory.

The multiband tuner, fitted with National type AM vernier dials and used in the grid circuit, is mounted centrally between the two tube sockets underneath the chassis. Individual filament transformers for each tube are mounted in the two forward corners. The plate r.f. choke and by-pass are toward the bottom and to the left in the bottom-view photograph. It was found necessary to enclose these two components with a partition shield, to remove the last trace of instability at the operating frequency. It was also necessary to shield the high-voltage lead with copper braid, from where it leaves the partition shield to the point where it goes up through the chassis to the plate tank-coil center tap.

Power terminals and a coax connector for r.f. input are along the rear edge of the chassis.

Since the multiband tuner protrudes below the chassis limits, a cutout was made in the bottom plate, and a 5 × 10 × 3-inch

* 236 Bilmarson Drive, Biloxi, Miss.



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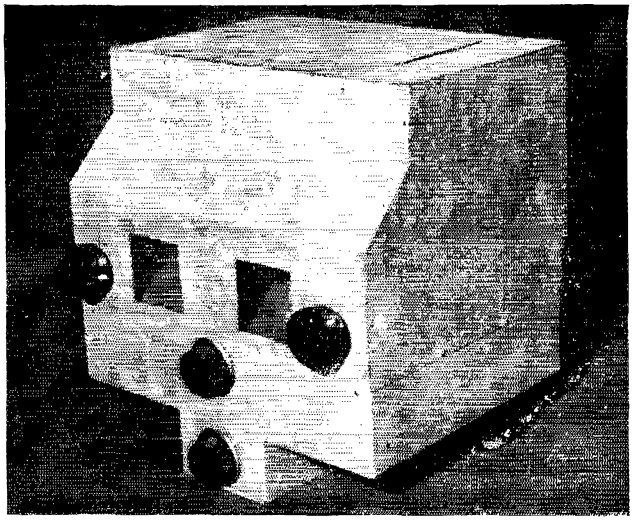
A high-power push-pull linear amplifier using 813s. The plate tank condenser and the variable link are operated through right-angle drives. The boxed-in section below contains a multiband tuner for the grid circuit. The feed-through insulator close to the tube to the right serves as a neutralizing condenser. A similar one is installed alongside the second tube.



The high-power linear amplifier with all shielding in place. The tubes may be seen through the screened cut-out in front. The unusual shape leaves room to mount meters near the top of the 17½-inch rack panel to which the unit will be attached.

♦

aluminum chassis serves as a box cover over the opening. A ventilating blower, mounted alongside the cover, with its motor inside the chassis, exhausts into the box, and thence into the chassis proper.

A shielding enclosure is not necessary for amplifier stability but, of course, is desirable in the consideration of TVI. The unusual shape, evident from one of the photographs, is a result of the discovery that cabling to meters mounted along the upper portion of the panel, to which the amplifier was eventually attached, was causing unbalance in the r.f. circuit. The indentation at the top of the enclosure still allows the original meter mounting, but isolates the meters and cabling from the r.f. circuit.

The enclosure shown in the photograph is made of galvanized sheet iron. It has a removable top cover to permit changing plate coils, and screened openings in front to allow a peek at the tubes while they are operating.

Originally, capacitive neutralization was used, as shown in the diagram. The neutralizing condensers consisted of a pair of ceramic feed-through insulators, mounted as close to the

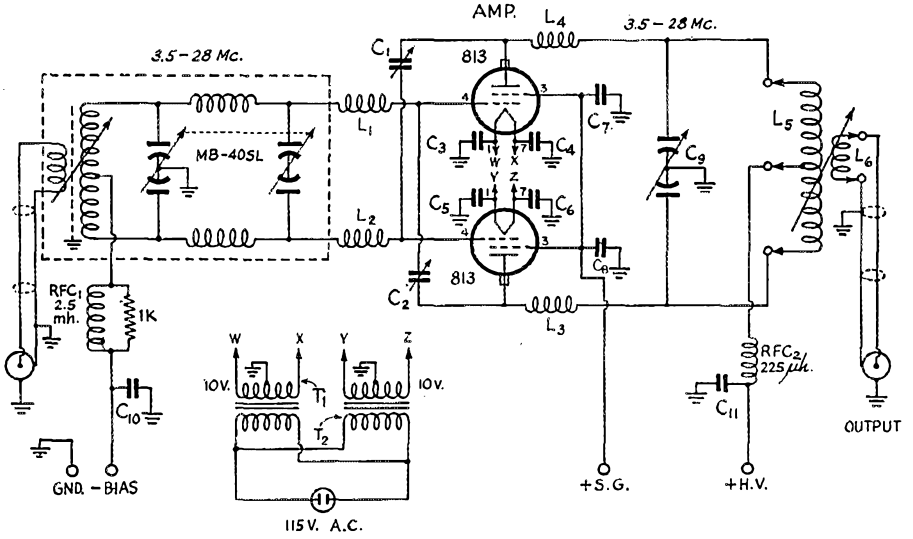
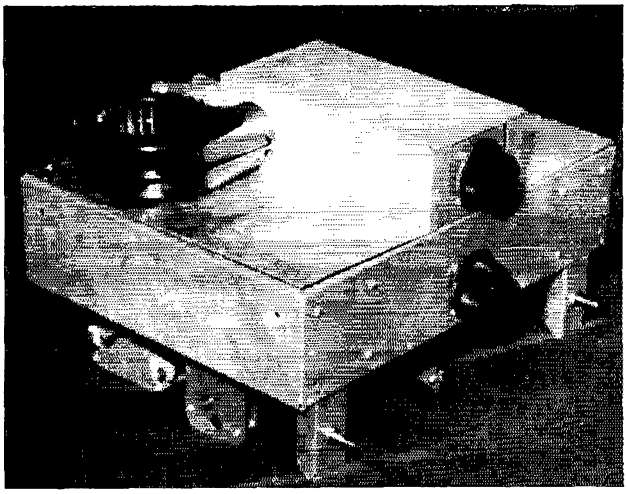


Fig. 1 — Circuit of the high-power push-pull linear amplifier.

C_1, C_2 — Neutralizing condenser — see text.
C_3, C_4, C_5, C_6 — 0.004 μf. disk ceramic.
C_7, C_8 — 0.001-μf., 1.5 kv., disk ceramic.
C_9 — Dual-section variable, 200-μμf.-per-section, 0.125-inch spacing (Johnson 200DD45).
C_{10} — 0.001 μf., disk ceramic.
C_{11} — 500-μμf., 3 kv., disk ceramic.
L_1, L_2 — 11 turns No. 20 d.c.c., ⅜-inch i.d., close-wound.
L_3, L_4 — 11 turns No. 14 bare, ⅜-inch i.d., turns close but not shorting (see text).
L_5 — 3.5 Mc. — 28 μh. — each half 13 turns No. 10 (Johnson 1000LCS80).
— 7 Mc. — 15 μh. — each half 8 turns No. 8 (Johnson 1000LCS40).
— 14 Mc. — 5 μh. — each half 5 turns ¼-inch tubing (Johnson 1000LCS20).
— 21 Mc. — 3 μh. — each half 4 turns ¼-inch tubing (Johnson 1000H/LCS14).
— 28 Mc. — 1.8 μh. — each half 3 turns ¼-inch tubing (Johnson 1000H/LCS10).
All above 3½-inch diam., 2½ inches long, each half, 1-inch space at center.
L_6 — 5-turn variable link.
MB-40SL — National multiband tuner.
RFC_2 — National R-175A.
T_1, T_2 — Merit P3145 (5-amp.) or P3146 (10-amp.). (See text.).



A ventilating blower mounted underneath the chassis exhausts into the chassis through the box shield covering the multiband tuner.

♦

tubes as possible. Adjustment consisted of running the second nut up or down on the threaded rod until neutralization was obtained. When neutralization was complete, the nuts were cemented in place.

Recently, however, link neutralization was tried with very satisfactory results. A 2-turn link was wound symmetrically on the center of the low-frequency coil of the multiband tuner, and 75-ohm ribbon run up through a hole in the chassis, central and behind the plate tuning condenser. This terminates in a 2-turn self-supporting link, 1 inch in diameter, wound with No. 12 wire, mounted on a ceramic stand-off. The stand-off, in turn, is mounted on a bracket fastened to the center brace of the tuning condenser. In general, this system is easier to adjust. Drive requirements are increased slightly, but linearity is just as good.

Attention to some details was necessary to obtain balanced operation of the amplifier. The 75-ohm 1-kw. Twin-Lead from the swinging link to the terminals at the rear should be brought under the tank-coil mounting, and out between the two sections of the tank condenser. Other routings tried caused unbalance. The capacitance between the plate of the right-hand tube and the mechanism driving the variable link was sufficient to unbalance the amplifier. This was compensated by mounting a metal tab near the left-hand tube, and bending it closer to or farther away from the tube until the circuit balanced.

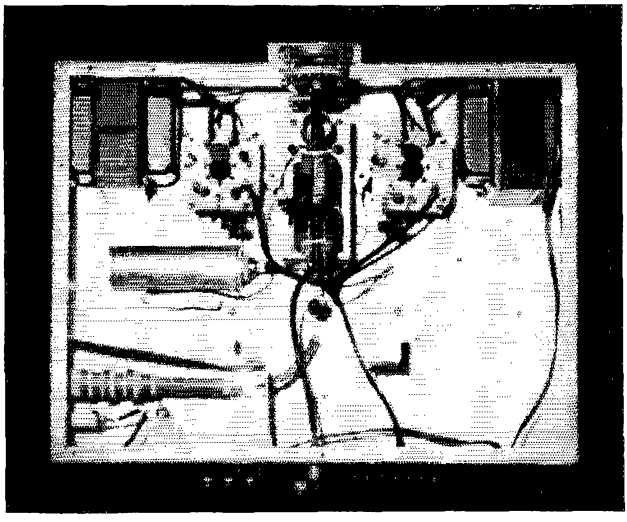
Power Supplies

Since little or no grid current is drawn, almost any good bias supply will suffice. VR tubes or batteries, or other such sources, with potentiometers across them will be satisfactory. The only requirements are that the source be good d.c., and that it be constant. The author uses an electronically-regulated supply for the purpose of facilitating experiments with various operating points and classes of operation.

When properly loaded, the maximum screen current drawn will not exceed 20 ma. Therefore, VR tubes are ideal for stabilizing screen voltage. A good steady screen voltage improves linearity and makes the tubes easier to drive. Screen voltage can be taken from the plate supply, if the latter has good regulation, by using VR tubes to stabilize the voltage dropped. The plate supply should also have as good regulation as possible. Use choke input, the lowest value of bleeder resistance the supply will tolerate, and as much output capacitance as possible. The proper idling current for this amplifier is 50 to 100 ma. This idling current should be considered part of the bleeder current. In this connection, it is strongly recommended that the amplifier be allowed to idle, and that cut-off bias not be used between transmissions.

Under normal s.s.b. operation with 2500 volts on the plates, 750 volts on the screens, and a biasing voltage of 80, the grid current

(*Continued on page 120*)



♦

Bottom view of the high-power linear amplifier, showing the tube sockets, filament transformers, and the grid-circuit multiband tuner. The plate r.f. choke and by-pass are enclosed in the partition shield in the lower left-hand corner. The electrolytic near the center was used in this instance to augment the filter capacitance in the author's screen supply.

Single-Ended Multiband Tuners

Simple Fundamentals of a Popular Six-Band Tank Circuit

BY C. VERNON CHAMBERS,* WIJEQ

SEVERAL years ago a six-band tank circuit was suggested by W4NKQ.[1] This homemade multiband tuner was a single-ended version of a push-pull tank of commercial design (National MB-150),[2] and covered amateur frequencies between 3.5 and 30 Mc. That the circuit meets with wide interest is attested to by correspondence received at Headquarters each time the tuner is used in *QST* gear. Nearly all of the inquiries concern the basic fundamentals of the circuit — an understandable situation, inasmuch as little has been written about what makes a single-ended tuner tick. This article will explain why the circuit, which consists of nothing more than two coils and a split-stator capacitor, can be made to cover six bands — 3.5 to 30 Mc.

Several features make the multiband tuner attractive for use in either or both grid and plate circuits of an r.f. amplifier. Some of the major advantages of the arrangement are:

1) Safety. There are no coils to change.

2) Economy. There is no need for a separate coil for each band and r.f. switches are not required.

3) Operating convenience. Band changing is accomplished merely by rotating a single control shaft — the same one that selects any frequency in the band.

4) Compactness. The small number of components involved assures minimum space requirements.

5) TVI reduction. Since no internal adjustments are necessary, the tank can be thoroughly and permanently shielded.

The Multiband-Tuner Circuit

The circuit of a multiband tank, Fig. 1, is not nearly as mysterious as many apparently

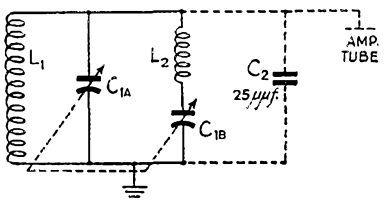


Fig. 1 — Circuit diagram of a typical single-ended multiband tuner. C_{1A} and C_{2B} are the two sections of a conventional split-stator capacitor.

believe. Basically, it is made up of a combination of two circuits, tuned simultaneously, each covering an approximate 2-to-1 frequency range.

The effective circuit of the multiband tank operating within the low-frequency range is shown in Fig. 2. For this mode of operation, the circuit is effectively a simple single-ended tank

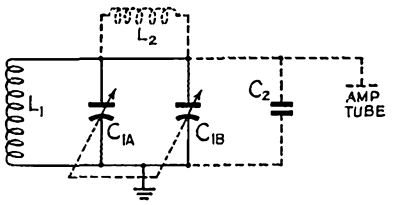


Fig. 2 — The effective low-frequency circuit of a multiband tank. Solid lines indicate components that are actually parts of the tuned circuit at frequencies below 14 Mc.

with the inductance supplied by L_1 and the capacitance by C_1 and C_2. Within the low-frequency range, the inductance of L_2 can be considered negligible with the result that the coil acts as little more than a jumper connecting the two sections of C_1 in parallel.

The effective high-frequency circuit, using the second mode of operation, is shown in Fig. 3. The circuit will be recognized as a conventional split-stator balanced circuit, with the tube connected across half of the capacitor. When the

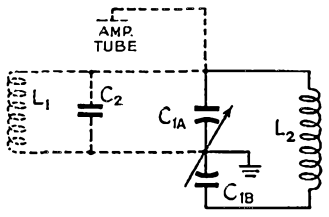


Fig. 3 — The effective high-frequency circuit of a multiband tank is drawn with solid lines.

tuner is adjusted for high-frequency operation, the impedance of L_1 is sufficiently high to have negligible effect on the C_1L_2 combination. For ham work, one of these circuits, for instance, can be made to cover the 80- and 40-meter bands, while the other is covering the 20, 15 and 10. Values are chosen so that the high-frequency circuit will not be tuned simultaneously to a harmonic of the low-frequency circuit.

In Fig. 1, the tuner is shown connected directly to ground as it would be in an amplifier using parallel feed, but redrawing the diagram to show use of series feed would have no effect on the discussion to follow. Amplifier components — r.f. choke, blocking capacitor, etc. — not essential to this particular presentation, are not shown in the diagram.

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* Technical Assistant, *QST*.

[1] Leiner, "All-Band Tank Circuit," *CQ*, May, 1949.

[2] King, "No Turrets — Just Tune," *QST*, March, 1948.

Choosing Circuit Values

Covering a 2-to-1 frequency range requires a 4-to-1 change in tuning capacitance. However, to provide some margin for staggering the tuning ranges to avoid harmonic responses, and for compensating for possible load reactance, the capacitance range should be greater than 4 to 1.

It is obvious that the maximum tuning capacitance necessary depends on the circuit capacitance when the tuning condenser is set at minimum. As a typical example, suppose tube and other stray capacitances amount to 25 $\mu\mu$f., and the minimum capacitance of the tuning condenser is 8.5 $\mu\mu$f. per section. In the low-frequency circuit, the sections of the tuning condenser are in parallel, so we have a minimum tuning-condenser capacitance of 16 $\mu\mu$f. This added to the circuit capacitance of 25 $\mu\mu$f. results in a minimum tuning capacitance of 42 $\mu\mu$f. Therefore, to cover a 2-to-1 frequency range, the tuning condenser must have a maximum capacitance of not less than $4 \times 42 = 168$ $\mu\mu$f., or 84 $\mu\mu$f. per section. To provide the margin mentioned previously, a condenser having 140 $\mu\mu$f. per section is selected. This provides an effective capacitance range of 42 to 305 $\mu\mu$f. (including circuit minimum).

If we select an inductance of 7.5 μh., the tuning range will be from 3.3 Mc. to 8.9 Mc., and 7 Mc. will come at about 65 $\mu\mu$f., and 3.5 Mc. at 270 $\mu\mu$f., assuming a non-reactive load.

In the high-frequency circuit of Fig. 3, the tube capacitance appears across only one of the tuning-condenser sections. Since this capacitance is in series with C_{1B} (so far as the coil is concerned), it will have a negligible effect on the effective capacitance across the coil. The minimum tuning capacitance will therefore be somewhat less than the minimum capacitance of one section of the condenser; i.e., less than 8.5 $\mu\mu$f. The maximum capacitance will be essentially half of the capacitance of one section, or 70 $\mu\mu$f.

With a coil of 2.4 μh. at L_2, the circuit will tune to 14 Mc. at 53 $\mu\mu$f., 21 Mc. at 23 $\mu\mu$f., and 28 Mc. at 13 $\mu\mu$f. The total high-frequency range covered will be approximately from 9 to 37 Mc.

Output Coupling

Output from the low-frequency section of the multiband tank can be most satisfactorily obtained by coupling to the grounded end of L_1. The most convenient and effective coupling system employs a series-tuned link as described in several *QST* articles.[3,4,5]

While output at 14 Mc. and above can also be obtained by coupling to the large inductance, L_1, this usually necessitates a much larger coupling link than is ordinarily deemed practical.[6] For this reason, it is preferable to couple out by means of a second series-tuned link coupled to the end of L_2 that is connected to C_{1B}.

General Considerations

It has been mentioned previously that either coil, when idle, has a negligible effect on the operation of the active circuit. This can be shown quite readily by computation, of course. It can also be proved in an experimental way by removing each coil, in turn, from the circuit and noting the change in tuning of the circuit in use. With the constants given above, shorting L_2 shifted the low-frequency range upward by only 80 kc. — about 2.7 per cent. When L_1 was disconnected, the high-frequency range was lowered by about 300 kc., again a change of less than 3 per cent. This, of course, may not hold true if other circuit values are chosen. The degree to which the effect of either coil can be neglected will depend on the value of reactance of the coil in one circuit at the frequency to which the other circuit is tuned. The effect becomes more pronounced as the coils approach the same inductance.

As with any other single-ended circuit, plate neutralization cannot be used, and some form of grid or link neutralizing is necessary, if neutralizing is needed.

Avoiding Harmonic Resonances

It will be noticed that resonance at both 3.5 and 14 Mc. occurs at the high-capacitance end of the tuning range, and that resonances at both 7 and 28 Mc. are obtained with the condenser near minimum capacitance. Therefore, if values are not chosen with care, it is perfectly possible that the tuner may resonate simultaneously at both the fundamental and the fourth harmonic of a signal. This can be avoided by making the tuning range somewhat greater than 2 to 1, and keeping the two ranges at opposite extremes; i.e., the low-frequency range toward the high-capacitance end, and the high-frequency range toward the low-capacitance end.

Strays

Teamwork does wonders. W3UJP reports that W3PII and W3SIR formed the winning entry in a recent Mobile Club of Pittsburgh hidden-rig hunt. W3PII had no mobile gear; W3SIR had no car.

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FCC has assigned the call W3NKF to the station operated by Naval Research Laboratory Amateur Radio Club personnel in Washington, D. C. Leo C. Young, consultant, Radio Division, NRL, and very well known on the air as W3WV, is the designated trustee. Mr. Young and the Laboratory have a long history of short-wave research and development (also see p. 21, Sept. 1953 *QST*). We are proud to say that much of this work was directly assisted by the coöperation of amateurs and their stations.

[3] "A Two-Control VFO Rig with Bandpass Exciter," *QST*, August, September, 1950.

[4] "Compact R.F. Assembly for 50- and 144-Mc. Mobile," *QST*, November, 1953.

[5] "Three-Control Six-Band 813 Transmitter," *QST*, January, 1954.

[6] Only a small portion of the total tank current flows through L_1 at frequencies of 14 Mc. and above.

Multiband Tuning Circuits

Some Considerations in the Design of Single-Ended Networks

BY R. W. JOHNSON,* W6MUR

• In recent months, we have been hearing more and more about multiband tuning circuits — circuits that cover 3.5 Mc. to 30 Mc., for instance, without switching or changing coils. This article covers the design of the single-ended type, and considers some possible variations from the popular version of the circuit.

A MULTIBAND tuning circuit was introduced by King [1] of the National Company in 1948. The circuit has been used in a recent transmitter by Chambers,[2] and is commercially available as the National Company Type MB-150 and MB-40L. There appears to have been only scant design data[3] presented on this circuit, to permit the average amateur to design his own circuit. There also has been overlooked a possible modification of the circuit using but one tapped coil instead of the two coils usually used. In this article, both of these subjects will be discussed.

Circuit Description

The basic circuit of King is shown in Fig. 1, in single-ended form. Equal capacitors are used

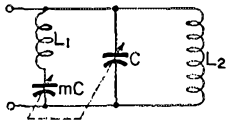


Fig. 1 — Basic circuit of a single-ended multiband tuner.

in the National circuits, but we will not restrict this discussion to equal capacitors. The capacitors are ganged together, and the coils (in the simplest case) have no mutual inductance between them. This circuit, properly designed, is capable of tuning ratios equal to the capacity ratio (C_{max}/C_{min}) instead of the square root of this capacity ratio as in ordinary circuits. Thus a continuous 8:1 or 9:1 frequency range is possible with this circuit, without coil switching.

Calibration

There are simultaneously always two parallel-resonant frequencies for the circuit of Fig. 1, as well as one series-resonant frequency. The two parallel-resonant frequencies may or may not be harmonically related, depending on design. The series-resonant frequency always lies between the parallel-resonant frequencies, and can even be used to advantage in suppression of certain harmonics.

If f_o is defined as the resonant frequency of L_2C taken alone, then the parallel-resonant frequencies of the total circuit are

$$f_{r_1} = K_1 f_o \qquad (1)$$

and

$$f_{r_2} = K_2 f_o \qquad (2)$$

where K_1 and K_2 are constant for all settings of C, and depend on L_1, L_2 and m of Fig. 1. If, as C is tuned through its range, f_o changes from f_{o_1} (the lowest frequency) to f_{o_2} (the highest frequency), frequencies f_{r_1} and f_{r_2} change from $K_1 f_{o_1}$ to $K_1 f_{o_2}$, and from $K_2 f_{o_1}$ to $K_2 f_{o_2}$, respectively. This situation is depicted in Fig. 2 on a frequency scale (not tuning scale). The two bands occupy the same positions on the capacitor tuning dial even though they are separated in frequency.

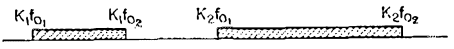


Fig. 2 — Frequency-scale representation of tuning range.

Since K_1 and K_2 depend only on L_1, L_2 and m of Fig. 1, they can be chosen arbitrarily, within limits. K_1 is a number less than unity, and K_2 is a number greater than unity, for realizable cases. The ratio K_2/K_1 can be almost anything desired, which means that the two bands of Fig. 2 can (a) overlap, (b) be adjacent, or (c) be separated, on the frequency scale. The maximum possible *continuous* (all frequencies covered) tuning range occurs in case (b), or when $K_1 f_{o_2} = K_2 f_{o_1}$, or $K_2/K_1 = f_{o_2}/f_{o_1}$. The tuning ratio for this case is $K_2 f_{o_2}/K_1 f_{o_1} = (f_{o_2}/f_{o_1})^2 = C_{max}/C_{min}$.

Selection of parameters is thus determined by the desired tuning ratios, or in other words, by K_2 and K_1. The design must be such that K_2/K_1 is about midway between integers, if harmonic response is to be minimized. We therefore need the relation between the Ks and the circuit parameters.

Relation for K

Input admittance of the circuit of Fig. 1 can be written in the usual fashion and set equal to zero. A fourth-degree quadratic frequency equation results, giving the parallel-resonant fre-

* % The Ralph Parsons Company, Pasadena 8, Calif.

[1] King, "No Turrets — Just Tune!" *QST*, March, 1948.

[2] Chambers, "Three-Control Six-Band 813 Transmitter," *QST*, Jan., 1954.

[3] DiMarco, "Circuitos de Resonancia Multiple y Su Apicacion en los transmisiores para Aficionados," *Revista Telgrafica Electronica* (Argentina), March, 1954.

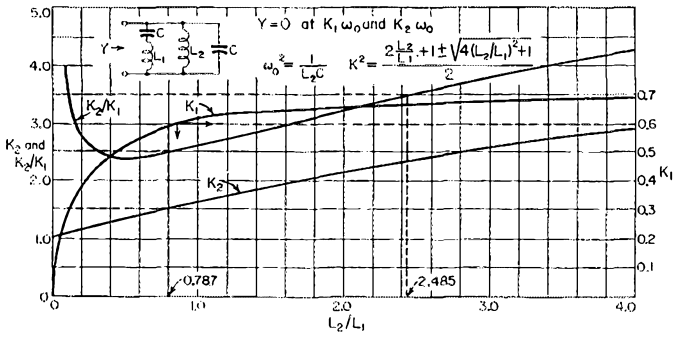


Fig. 3 — Curves of K_2, K_1, and the ratio K_2/K_1 *vs.* L_2/L_1, for equal capacitors ($m = 1$).

quencies (and hence K) when solved. The relation for K is

$$K_1^2 = \frac{S - \sqrt{S^2 - 4\frac{L_2}{mL_1}}}{2} = (f_{r_1}/f_o)^2$$
$$K_2^2 = \frac{S + \sqrt{S^2 - 4\frac{L_2}{mL_1}}}{2} = (f_{r_2}/f_o)^2, \quad (3)$$

where $S = \frac{L_2}{L_1}\frac{1+m}{m} + 1$, and $f_o = \frac{1}{2\pi\sqrt{L_2C}}$

Since L_2/L_1 is usually desired when given m and K, *Eq.* (3) can be rearranged to give this result. Thus,

$$L_2/L_1 = mK^2\frac{K^2 - 1}{(1+m)K^2 - 1} \quad (4)$$

which is valid for either K_1 or K_2. For the usual case of equal capacitors, $m = 1$ and *Eqs.* (3) and (4) become

$$K^2 = \frac{2L_2/L_1 + 1 \pm \sqrt{4(L_2/L_1)^2 + 1}}{2} \quad (3a)$$

and

$$L_2/L_1 = K^2\left(\frac{K^2 - 1}{2K^2 - 1}\right) \quad (4a)$$

In *Eq.* (3a), the plus signs is used in solving for K_2 and the minus sign for K_1.

Curves of K_2, K_1 and the ratio K_2/K_1 *vs.* L_2/L_1 are shown in Figs. 3 and 4. Fig. 3 is for equal capacitors ($m = 1$), and Fig. 4 is for $m = 0.5$. Preferred operating points, to avoid harmonic responses, are shown on the curves.

If unequal but ganged capacitors are used, then $m \neq 1$. As can be seen from Fig. 4, the preferred operating point, $K_2/K_1 = 2.5$, falls at $L_2/L_1 = 1.06$ when $m = 0.5$. Thus, if it is more convenient to use identical coils for L_1 and L_2, m can be chosen accordingly. The value $m = 0.789$ gives $L_1 = L_2$ and $K_2/K_1 = 2.5$.

Example

As a design example, suppose we desire to tune all amateur bands in the range 3.5–21.5 Mc. Assume that equal ganged capacitors are used, and that the available capacitor ratio is at least 6.25:1 (corresponding to, say, 150 $\mu\mu$f. maximum and 24 $\mu\mu$f. minimum). If we want continuous frequency scale coverage, we would choose $K_2/K_1 = (6.25)^{1/2} = 2.5$. This value is a preferred operating point in Fig. 3, at which $L_2/L_1 = 0.8$, $K_2 = 1.5$ and $K_1 = 0.6$. The lowest desired frequency, 3.5 Mc., is $K_1 f_{o_1}$, so that f_{o_1} (the resonant frequency of L_2C_{max} is $3.5/0.6 = 5.83$ Mc. For a given capacitor, coil L_2 is determined from this frequency of 5.83 Mc. Coil $L_1 = L_2/0.8 = 1.25L_2$. At minimum capacity, the resonant frequency of L_2, C_{min} is $5.83 \times 2.5 = 14.6$ Mc. Thus, the two bands A and B of Fig. 2 extend from $0.6 \times 5.83 = 3.5$ Mc. to $0.6 \times 14.6 = 8.75$ Mc., and from $1.5 \times 5.83 = 8.75$ Mc. to $1.5 \times 14.6 = 21.9$ Mc. These two bands are of course coincident across the dial, and are covered simultaneously in 180° of capacitor rotation.

Coupled Impedance

Output coupling can be to coil L_2 only. In this case, parallel-resonant impedance is about K^2 times what it would be for a normal L_2C circuit. This means that in the lowest band, where K_1 (< 1) is used, capacitor C can be smaller than that which would otherwise be

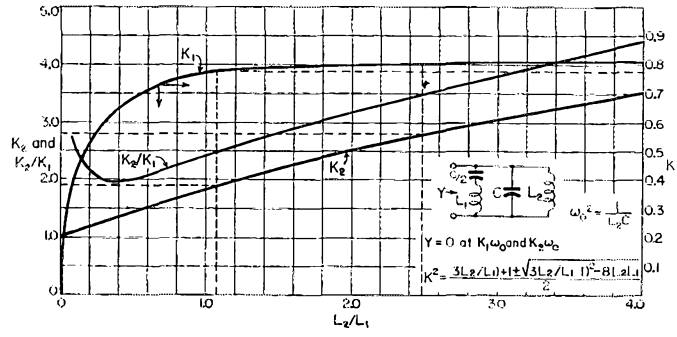


Fig. 4 — Curves of K_2, K_1, and the ratio K_2/K_1 *vs.* L_2L_1 for $m = 0.5$.

necessary; and in the higher band, where K_2 (> 1) is used, C can be larger than would otherwise be necessary. L/C ratio and ease of coupling thus tend to remain more constant with this circuit than with an ordinary resonant circuit. This was pointed out by King.[1]

Coupled Coils

The general case, where mutual inductance exists between L_2 and L_1, has been worked out, but the results will not be presented here, except for one special case that is extremely useful. This case is that of a center-tapped coil, connected as shown in Fig. 5 with a split-stator capacitor C.

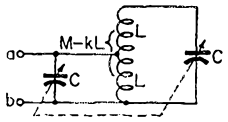


Fig. 5 — Multiband-tuner circuit using a center-tapped coil.

Connection to the tank circuit is made at terminals a and b in Fig. 5. The impedance between a and b is parallel-resonant at $K_1 f_o$ and $K_2 f_o$ as before, where K is now given by the relations

$$K_1^2 = \frac{3 + 2k - \sqrt{(3 + 2k)^2 - 4(1 - k^2)}}{2(1 - k^2)}, \quad (5)$$

and $$K_2^2 = \frac{3 + 2k + \sqrt{(3 + 2k)^2 - 4(1 - k^2)}}{2(1 - k^2)},$$

where k is the coupling coefficient between the two halves of the coil. (k is negative for this case, but this has already been considerated in *Eq.* (5), to avoid errors in using the relations.) Frequency f_o for use with *Eq.* (5) is given by

$$f_o = \frac{1}{2\pi\sqrt{LC}},$$

and is the resonant frequency of half the total coil taken alone with C. A curve of *Eq.* (5), showing K_1, K_2 and K_2/K_1 *vs.* coupling coefficient k is shown in Fig. 6. Preferred operating points, to avoid harmonic response, are also indicated in Fig. 6.

Estimation of Coupling Coefficient

To use the curves of Fig. 6 or the relations of *Eq.* (5), a relation between coupling coefficient and coil dimensions is needed. Fortunately, this relation is not complex for a center-tapped coil. As shown in Fig. 7, a center-tapped coil can be replaced by a T equivalent. Looking into terminals a-b or b-c we see merely L, but looking into terminals a-c we see $2L(1 + k)$. One can apply the Wheeler formula[4] for the inductance of a single-layer solenoid that is not too short (length at least equal to 0.8 times diameter) to solve for coupling coefficient k. This is done by first calculating the inductance between a-b (or b-c) for a coil of half the total length and half the total turns, and then the inductance between a-c for a coil of the total length and total turns. These two relations when solved simultaneously give coupling coefficient as

$$k = \frac{9}{9 + 20(l/d)} \quad (6)$$

where k is of the correct sign for substitution into *Eq.* (5). (l/d) is the ratio of length to diameter of the coil, in the same units of measurement. *Eq.* (6) holds only for values of (l/d) of about 0.8 or greater. A curve of k *vs.* (l/d) is shown in Fig. 8. The portion much below $(l/d) = 0.8$ has been obtained by another more exact inductance formula, but with the same approach.

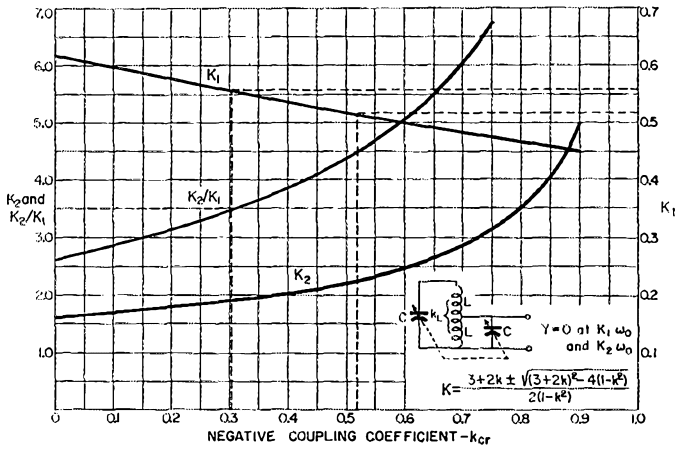


Fig. 6 — Curve of *Eq.* (4), showing K_1, K_2, and K_2/K_1 *vs.* coupling coefficient k.

Example

Suppose we wish to cover the range 3.5–30 Mc., such as to tune all amateur bands. For a given capacitor and capacitor tuning ratio, what must be the size and proportions of a single, center-tapped inductance?

We first observe that the total tuning ratio is

[4] Terman, *Radio Engineer's Handbook*, 1st ed., 1943, McGraw-Hill, p. 55.

30/3.5 = 8.58. If we were to insist on continuous frequency scale coverage of the entire range, ratio K_2/K_1 must be $(8.58)^{1/2} = 2.93$. This is dangerously close to 3, so that third harmonic response would be appreciable if this ratio were used. We therefore choose the nearest value of K_2/K_1 that is a preferred operating point, or $K_2/K_1 = 3.5$, realizing that in so doing we must allow a gap to exist in the frequency coverage, if we must still tune 3.5–30 Mc. (Continuous coverage with $K_2/K_1 = 3.5$ requires a capacity tuning ratio of $(3.5)^2 = 12.25$, which is impracticably high.)

From Fig. 6 at $K_2/K_1 = 3.5$, we find $K_2 = 1.92$, $K_1 = 0.55$ and $k = 0.3$. From Fig. 7 at $k = 0.3$ we find l/d of the coil to be 1.05. Arbi-

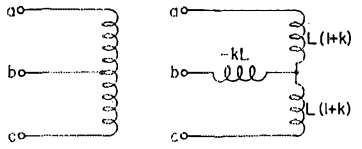


Fig. 7 — T equivalent of a center-tapped coil.

trarily setting the lower band limit at 3.4 Mc. to insure coverage at 3.5 Mc., resonant frequency f_{o1} is $3.4/K_1 = 3.4/0.55 = 6.19$ Mc. With a capacitor tuning ratio of 9:1, $f_{o2} = 3 \times 6.19 = 18.55$ Mc. Thus the two bands are

$6.19 \times 0.55 = 3.4$ Mc. to $1855 \times 0.55 = 10.2$ Mc., and

$6.19 \times 1.92 = 11.9$ Mc. to $18.55 \times 1.92 = 35.6$ Mc.

No coverage is obtained between 10.2 Mc. and 11.9 Mc., but this is unimportant for amateur applications.

The design is therefore complete. One selects a coil such that *one half of the coil* has a length-to-diameter ratio of 0.525, and for a given maximum value of capacitor C, finds the number of turns this half-coil must have to resonate at 6.19 Mc. The final coil has just twice the number of turns and twice the length of the half-coil. The capacitor must be at least 9 times the minimum value expected, which minimum includes strays and tube capacitances. Thus a capacitor of maximum value about 200 $\mu\mu$f. per section is necessary if a 9:1 capacity tuning ratio is required.

The circuit can be tested by first tuning only half of the coil by C, with the remainder of the circuit disconnected. A grid-dip meter can be used to indicate resonance in the usual way. Connecting the remainder of the circuit as in Fig. 5, a grid-dip meter coupled to the coil will show the desired resonance points. Depending on coupling to the grid-dip meter, *three* dips may be noted as the grid-dip meter is tuned, for any setting of C. These will be at a low, medium and high frequency. The one at medium frequency may be disregarded: it is the series-resonant frequency of the circuit. Only the lowest and highest dip need be considered, and these should be close to the calculated values.

Experimental Verification

A Barker & Williamson Type 3015 coil (1-inch diameter, 16 turns per inch) was used in a test circuit. The coil used had 34 turns total, and was center-tapped and connected with ganged 150-$\mu\mu$f. capacitors in the circuit of Fig. 5. Resonant frequencies were measured with a grid-dip meter, using the calibration of the meter (which is not highly accurate). The following results were obtained:

	Measured	*Calculated*
Band A	3.45 — 11.4 Mc.	3.41 — 11.15 Mc.
Band B	10.4 — 35.9 Mc.	10.4 — 34.0 Mc.

Summary

This article has given essential design relations for the two-coil and center-tapped single-coil cases of wide-range tuning circuits. Application of these circuits, especially the latter (Fig. 5), to transmitters can result in much more compact equipment than has been possible with band-switching circuits, with resultant saving in cost, complexity and efficiency.

(Continued on page 122)

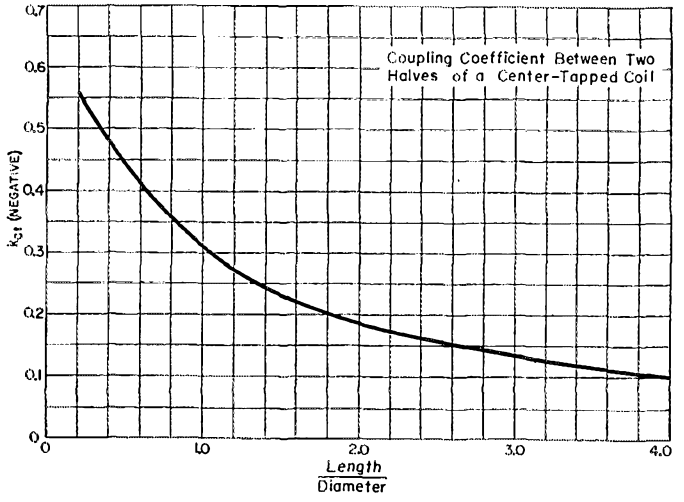


Fig. 8 — Curve of k *vs.* l/d for center-tapped coil.

Reducing Tank-Condenser Minimum Capacitance

A CONSIDERABLE NUMBER of inquiries have been received on the possibility of substituting an 813 for the 4-250A in the pi-network tank circuit amplifier described in October, 1952, *QST* and in subsequent editions of the *Handbook*. We have hesitated to recommend the substitution in cases where 28-Mc. operation has been a factor, for the reason that the larger output capacitance of the 813 tends to raise the circuit minimum, increasing the tank Q at this frequency to the point where the efficiency would tend to suffer.

W8FRM, Clarence R. Acker, of Zanesville, Ohio, has an answer — revamping the tank condenser to "amputate" some of the minimum capacitance. The photograph shows what he did to the TMA-150A condenser and the following quote from his letter describes the operation:

". . . reworking the condenser eliminated 10-$\mu\mu$f. capacity. This decrease compensates for the 10-$\mu\mu$f. difference in output capacity of the 813 over the 4-250A. I find that with 4¼ turns in L_2[1] the final tunes to 29.7 Mc. with the condenser open about 175°. In order to tune at 28.5 Mc. for maximum output I find it works best if I add one turn from L_3. I feel that if I increase L_2 to 5 full turns the final will still cover 29.7 and make it possible to cover 28.5 without adding the turn from L_3.

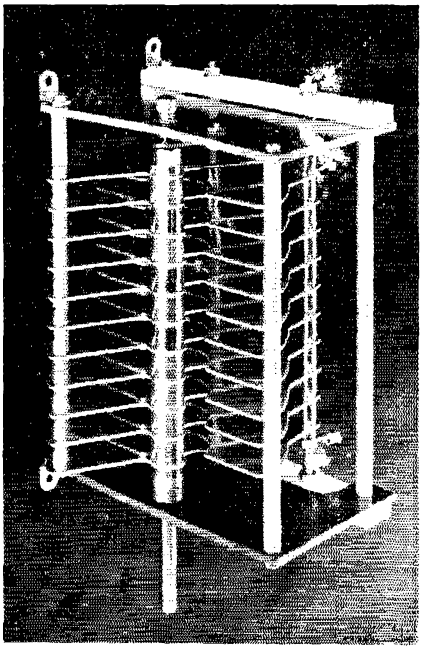
"The capacitor was reworked by replacing both end plates with a canvas-base bakelite material 3/16 inch thick. The original end plates were used for templates. Power factor and dielectric constant of the material are unimportant in this application. The only requirements are heat stability and a certain amount of strength. I doubt that polystyrene will work because it loses its strength at a relatively low temperature.

"I had trouble locating the right tap to tap the hole in the back end plate for the friction-adjustment stud. Therefore, I drilled a hole a little larger than the root diameter of the stud, put the stud in a drill press and forced it to cut its own threads by turning the drill by hand and pressing the stud into the material while I turned it.

"After about six weeks of off-and-on work with the final, I found that the end plates have bowed a little, decreasing the rotor friction. This does not bother my set-up because the friction in my dial prevents the rotor from swinging. However, a small aluminum channel could be placed along the top edge of the plates to prevent this bowing. If the angle is small and placed along the top outside edge I don't think the increase in capacity will be measurable."

It might be added that a small amount of warping of the end plate will not affect the rotor contact, since this is made through wiping fingers.

In this connection, it is understood that the TMA type condenser has been discontinued by the National Company and is now practically unobtainable. A possible substitute is the Johnson type 150D70. This has the requisite plate spacing and is the same length as the TMA-150A. Its rated minimum is somewhat higher, however, being 31 $\mu\mu$f. against a rated value of 22.5 for the TMA-150A. It should be possible to overcome this to a considerable extent by moving the mounting angles to the opposite ends of the end pieces so the stator plates will be considerably separated from the chassis, since stator-plate-to-chassis capacitance usually makes a substantial contribution to the total minimum in practice. And, of course, insulating end plates can be substituted as was done by W8FRM on the TMA-150A.



Substituting bakelite end plates for the metal ones supplied with the condenser reduced the minimum capacitance by approximately 10 $\mu\mu$f.

— *G. G.*

[1] Circuit designations refer to the circuit on p. 15, October, 1952, *QST*, or Fig. 6-101 in the 1954 *Handbook*. — ED.

Strays

W3VKD, who worked all states on 'phone during the 1953 Sweepstakes, reports the feat now fully confirmed by QSLs. —*W1ZDP*

Invading Never-Never Land

Some Tips on Receiver Design and Construction

BY ROGER PETERS,* WØWHZ

• Here is an article that dares to be different in two ways: It makes a case for building your own receiver (of all things!), and then leaves you out in space by not giving complete details for a design. But when you get over the original shock, you're likely as not to start thinking about your own special receiver, and that's just what WØWHZ wants you to do.

Most amateurs today eventually specialize in one favorite mode of transmission and activity in a certain band. This is because technical progress has advanced to the point where it is almost impossible to know about all of the different phases of amateur radio. This brings us about to one aspect of amateur radio that has been sadly neglected: the sacred "never-never land" of receiver construction and design.

The average ham who still believes in "build your own" talks at great length of s.s.b. exciters, gang-tuned VFOs, kw. rigs, v.h.f. converters, etc., but mention "receivers" and he shuts up like a clam. But, if you have to use a specialized transmitter and antenna, how can you believe that a receiver made to satisfy the whims of every ham and SWL who might be a prospective buyer can give maximum performance?

The usual approach is to buy a commercial receiver and hang all kinds of converters and adapters on it to get the desired performance. If you had a receiver built to your specifications you could eliminate all of the outboard attachments and do it at no more, or even less, cost, because there are probably a lot of features on your superblooper that you never use anyway.

If you have an expensive commercial receiver, you can probably think of ways to improve it for your particular needs. But if you tear into it, the resale value may go down, so you leave it alone. That's a good reason why receiver progress is not as rapid as we would like to see it.

But if you build your own you aren't afraid to modify and modernize it as the need arises. You can't beat the feeling of confidence and pride that you have when you know every part of your receiver personally. If a new circuit comes out, you know how to use it to best advantage in your layout. A real ham of the old-timer school would feel he was admitting defeat if he bought a receiver. We need more pride-in-a-job-well-done attitude and less of the "let-George-do-it" approach generally found today.

* 4421 South 33rd St., Omaha 7, Nebr.

Someone always come up with the argument that it costs as much to build as to buy. Sure it might, if you used all new parts — but who does? Every ham has some trading stock and keeps an eye out for deals. With a little smart "horse trading" you can keep the cost of a receiver considerably below the commercial product.

It's a lot easier now to build your own than it was a few years ago. It is a great help to build or acquire a grid-dip meter. The use of slug-tuned coils makes tracking a superhet no harder than tuning a transmitter. If you have had experience building transmitters, the building of a fairly advanced receiver should not present too many problems. The diagrams of the receivers to be shown are not given in detail since they are very conventional and were taken from the receiver chapter in the *Handbook*. You will probably have your own ideas about the circuit, anyway. The hardest problem is the mechanical construction and layout. The performance of the receiver will depend on how thoughtfully this job is carried out. So let's consider some of the different construction ideas we can use.

Construction

One of the main things to remember is to use sturdy construction. Build your receiver like you build a VFO. As always, good construction pays off in better mechanical stability. If you are the type that can be satisfied once you get your receiver working properly, conventional chassis construction is OK for you. An example of chassis construction is shown in Figs. 1 and 2. Note the extensive shielding between stages. Plenty of shielding is good insurance against oscillation in i.f. amplifiers, and it also keeps b.f.o. harmonics where they belong. The shielding also adds to the strength of the chassis. It's a lot easier to put it in now than to have to put shielding in after the set is wired.

Chassis Plates

The idea of mounting a small chassis on the main chassis gives more flexibility to the layout and much better shielding. It has the disadvantage that once you get it together you can't do much checking. As a result of past experience with the limitations of the chassis-on-chassis construction, I "graduated" to the chassis-plate idea. By this means you can build i.f. strips, etc., on flat plates that are screwed down to the main chassis or frame. Changes or modifications to individual units can then be easily made without disturbing other circuits. This is illustrated in Fig. 3. Note also how the shield partitions are built between each section in Fig. 4. This adds consider-

(*Continued on page 122*)

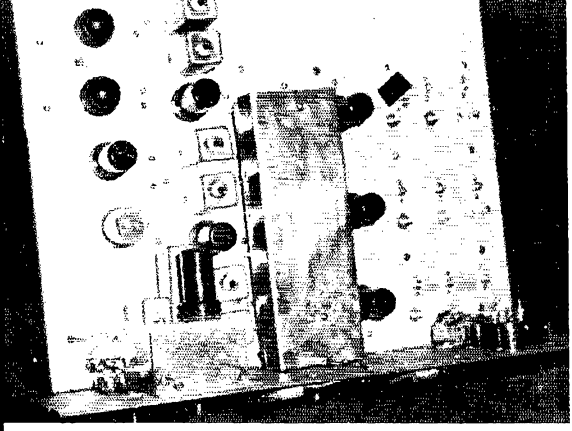


Fig. 1 — Top view of a 12-tube receiver. A good degree of selectivity for 'phone signals is obtained by using six inexpensive 455-kc. i.f. transformers. The smaller shield box fastened to the panel houses the b.f.o.

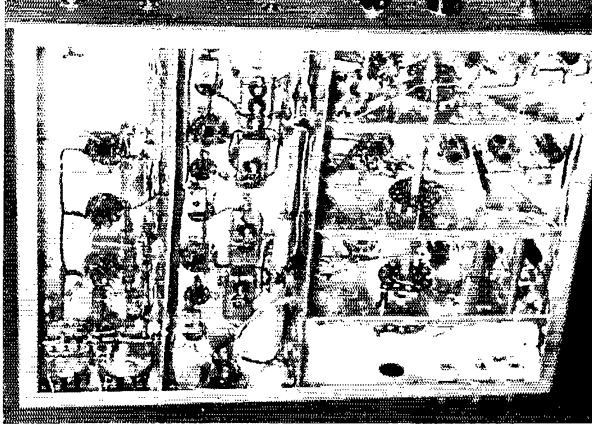


Fig. 2 — This illustrates the extensive under-chassis shielding used in the 12-tube receiver. The left-hand section is audio, noise-limiter and S-meter circuits, the right-hand side is r.f., mixer and oscillator.

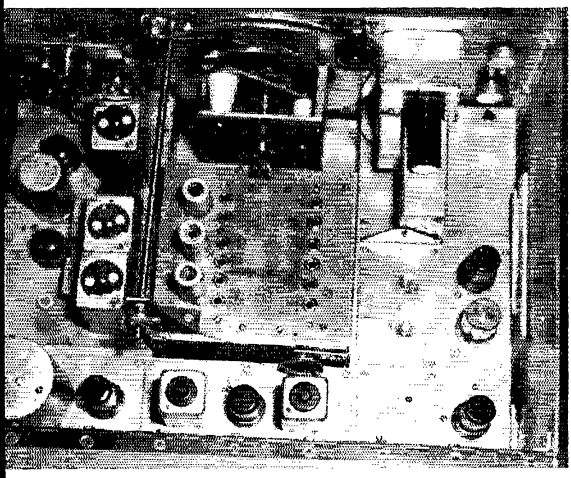


Fig. 3 — This 26-tube receiver illustrates "plate" construction. The "front-end" coil assembly is plug-in and has been removed to show the homemade dial and drive mechanism.

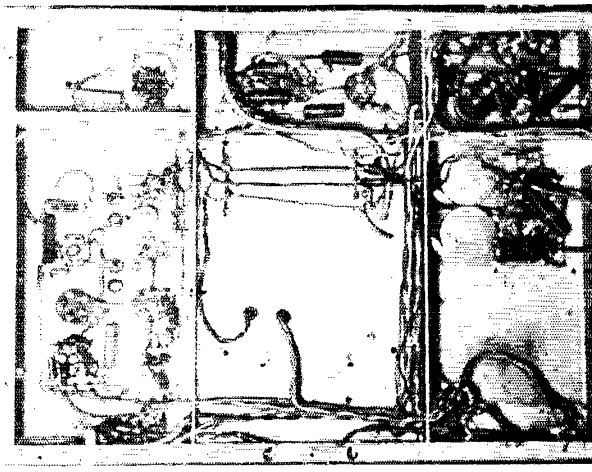


Fig. 4 — A view of the underside of the 26-tube receiver shows how the shield partitions serve as mounts for the "plates" on which sections of the receiver are mounted. The partitions also add strength.

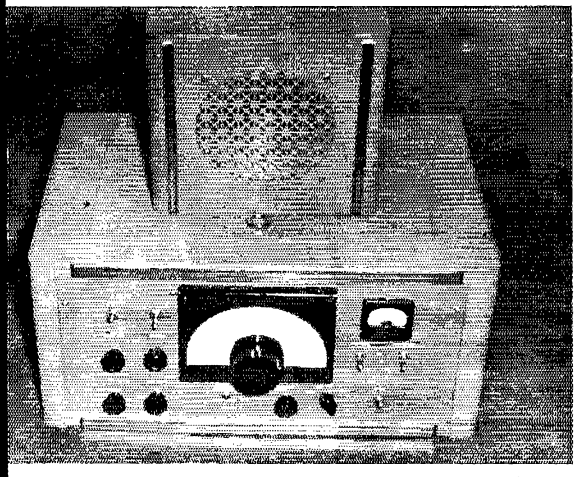


Fig. 5 — Front view of the 12-tube receiver. The dial bezel contains lights in the upper corners for illuminating the dial face. Speaker housing also contains power supply and audio-output stage.

Fig. 6 — The dual-conversion 26-tube receiver has i.f.s of 1415 and 142 kc., and uses panoramic presentation to avoid "high hatting" calls a few kc. off frequency, which with high selectivity might otherwise happen.

50 Mc. TVI—Its Causes and Cures
(Part II)

High-Pass Filters for 50 Mc. and Lower Bands

BY F. E. LADD,* W2IDZ

THE nature of the problem the 6-meter enthusiast faces in working on his favorite band in areas where Channel 2 is in use was discussed in the preceding section of this article.[1] Steps that can be taken at the transmitter to reduce interference were outlined. In this portion we attack the receiver end, which is where much of the corrective work must be done.

After early experiences with TVI caused by 50-Mc. transmitters in the American ham's first tussle with Channel 2, the writer began studying the literature on high-pass filter design. It was apparent that this adjacent-channel situation was mainly a receiver problem. It was easy to be discouraged at this point, as the cut-off frequency of the filter would have to be very close to the first frequency of high attenuation. Most of the literature indicated that such a filter would be too critical in adjustment to be practical. One reference stated flatly that it could not be done!

I approached Mr. T. W. Winternitz, W2YTH, who has had extensive engineering experience in this field. He felt that these references were too pessimistic. So, we got our heads together, and by using standard high-pass filter tables[2] we derived a 300-ohm filter. It not only protects the TV set from 50-Mc. interference, but gives excellent protection for all lower amateur bands.

Filter for Balanced Lines

The filter for use with 300-ohm balanced lines is shown schematically in Fig. 6. Values given are slightly different from those derived theoretically; they were chosen so that commercially-available components could be used. They also take the stray L and C components into account.

Transmission characteristics of the filter are shown graphically in Fig. 7. I did not have equipment available for this part of the job, and I wish to thank Mr. J. P. Van Duyne, W2MLX, for making the measurements and plotting the curve. Note that overload protection is very good on all frequencies below 52 Mc., so this filter will give excellent results when you operate on any of the lower bands, as well as doing the job on 50 Mc.

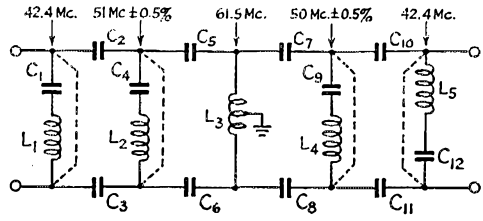
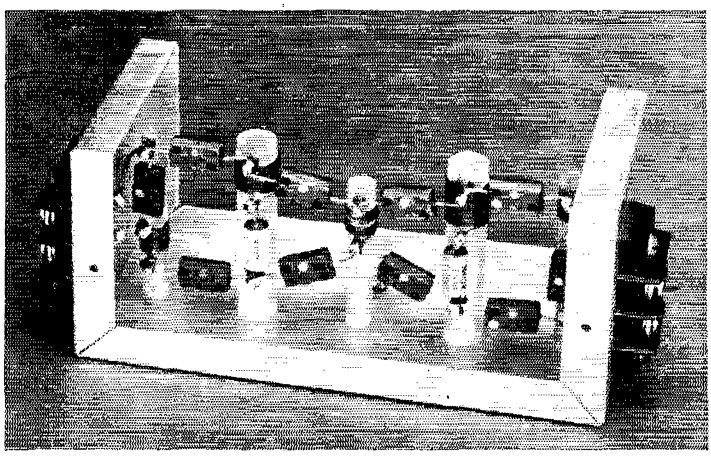


Fig. 6 — Schematic diagram and parts information for the 300-ohm balanced-line filter. Dotted lines are shorts removed after adjustment of coils.

C_1, C_{12} — 10-$\mu\mu$f. ceramic, 10 per cent tolerance (Erie Ceramicon).
C_2, C_3, C_{10}, C_{11} — 20-$\mu\mu$f. silver mica, 5 per cent tolerance (El-Menco CM-15).
C_4 — 5-$\mu\mu$f., similar to C_1.
C_5, C_6, C_7, C_8 — 15-$\mu\mu$f., similar to C_2.
C_9 — 6.8-$\mu\mu$f., similar to C_1.
L_1, L_5 — 1.4 μh., 18 turns No. 28 enam. on ¼-inch form.
L_2 — 1.85 μh., 17 turns No. 24 enam. on ⅜-inch diam.
L_3 — 0.4 μh., 10 turns No. 24 enam., center tapped on ¼-inch form.
L_4 — 1.45 μh., 14 turns No. 24 enam. on ⅜-inch form.



High-pass filter built by W2IDZ to protect TV receivers from fundamental overload on all frequencies up to at least 51 Mc.

* Bowers Place, Denville, New Jersey.

[1] P. 21, June 1954 *QST*.

[2] Terman, *Radio Engineers Handbook*.

On my own TV set, 35 db. of attenuation has proven adequate to prevent overload, even when I am on 6. All receivers are not that good, but a considerable safety margin has been built into the

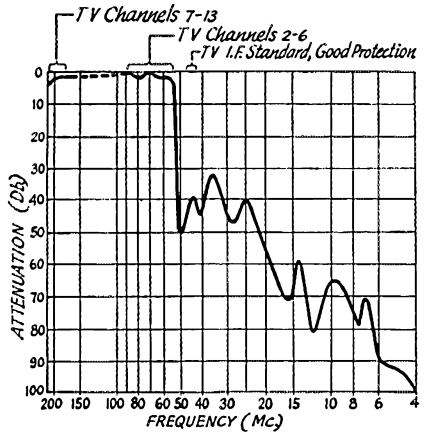


Fig. 7 — Transmission characteristics of the 300-ohm filter. Overload protection is very good on all amateur frequencies below 52 Mc. Attenuation below 4 Mc. is in excess of 100 db.

filter. (Note that the attenuation is approximately 50 db. at 50 Mc.) Less attenuation is needed to prevent overloading of the receiver by frequencies lower than 50 Mc., as the selectivity of the TV tuner becomes a factor and its attenuation is added to that provided by the filter. The curve of Fig. 7 shows a slight insertion loss on the high channels, reaching a maximum on Channel 13. No noticeable deterioration in actual reception results has been encountered, however, even where the filter has been used in areas where the Channel 13 picture is weak. If an insertion loss is noticed, it is more likely the result of poor matching at the antenna than of the normal loss of the filter itself.

Filter for Coaxial Lines

The only TV sets I encountered were those designed for balanced lines. However, the 300-ohm filter worked so well that I got brave and derived a 75-ohm model for use with receivers designed for coaxial-line feed. It is shown schematically in Fig. 9. The pass-band characteristics of this filter have been measured, and it shows less loss than the 300-ohm model. The stop-band characteristics have not been measured, but it should be at least as good as the 300-ohm model. Overload tests with TV sets having 75-ohm input bear this out.

Building the Filters

The mechanical construction of the 300-ohm filter should be clear from the photograph and Fig. 8. The aluminum case is an ICA No. 29439 or equivalent, 2½ by 2¼ by 5 inches. The five coils are mounted along the centerline of the box, one inch apart. The terminal strips are mounted on the outside ends, ¾ inch in from the edge of the box. The coils at the two ends of the filter are identical except for their positions on the form. Note that the two coils either side of the center are not quite identical. The scale of the drawing is enlarged for the center coil, to show its mechanical construction more clearly. The form is actually ¼ inch in diameter and 1⅝ inches long. It is drilled through at a point $1\frac{1}{32}$ inch from the end, to allow the center-tap leads to be brought through the form.

Terminals for the windings are made of short pieces of stiff wire forced into holes the size of the wire used. (No. 16 wire, No. 56 drill.) The shorting buswires shown as dotted lines in the schematic diagrams are extensions of the terminal wires. These are cut off after adjustment is completed. The terminal wires can be forced into the holes by heating the wire slightly with a soldering iron. When the form cools it will leave a

(*Continued on page 184*)

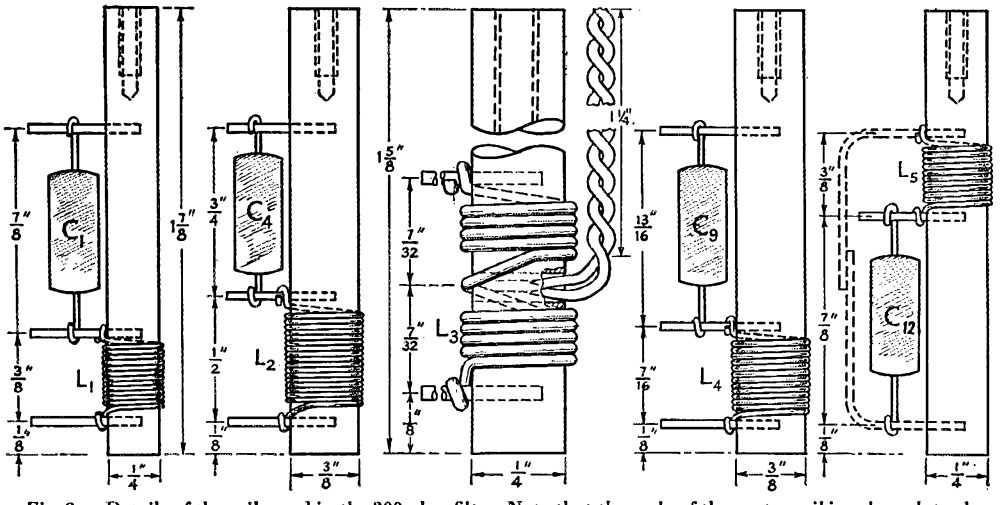


Fig. 8 — Details of the coils used in the 300-ohm filter. Note that the scale of the center coil is enlarged, to show details more clearly. The form is drilled to permit bringing the center-tap leads through the form as shown. They are cleaned, twisted together, and soldered.

Some Principles of Radiotelephony

Part III† — *The "How" of Modulator Power*

BY BYRON GOODMAN,* W1DX

RECOGNIZING the need for modulator power in any practical 'phone transmitter, the next step is to examine some of the methods that can be used to generate this power. Part I of this series indicated that a microphone develops an alternating current corresponding to the variations in air pressure that make up "sounds" — the problem is to build up the extremely low power represented by these currents to a power level that can be measured in tens or hundreds of watts. Since vacuum-tube amplifiers will be used for this purpose (although transistors might be substituted at the low-power levels), let's review briefly how a vacuum tube works.

Anyone with a license or studying for a license undoubtedly knows the basic principle of vacuum tube. A heated "cathode," in a vacuum, emits electrons. "Electrons" can get to be rather complicated — ask any physicist — but for our purpose it is sufficient to know that they are the smallest particles whose mass and charge have been determined. The charge is negative and, if any of the electrostatic theory in the introductory paragraphs of many radio textbooks rubbed off on you, you know that *like charges repel* and *unlike charges attract.* Knowing this, the first thing we run into when our vacuum-tube cathode gets up to temperature and starts to emit electrons is "space charge." This formidable term simply means that the first electrons emitted from the cathode hang around the vicinity of the cathode, for want of a better place to go. Being negative charges, they repel other electrons that might have a hankering to be emitted from the cathode. The result is that, with no other charges (or electrostatic fields) near the cathode, we have a cloud of electrons surrounding the cathode, and this cloud prevents further emission from the cathode. The cloud can be pushed out farther by increasing the temperature of the cathode.

Further negative charges near the cathode, from some external source like a battery or charged condenser, only serve to compress the space charge still more. But put a positive charge near the space-charge region, and some of the electrons of the space charge are attracted by this positive charge. (Remember, unlike charges attract.) Moving some of the electrons from the space charge permits other electrons to be emitted from the cathode, to make up the deficit. The higher the magnitude of the positive charge, or potential (it is measured in volts), the greater the number of electrons that are attracted.

The Diode

It's easy to prove this to yourself. Take a diode — which is a cathode and a "plate," or "anode," mounted in a vacuum — and connect it as shown in Fig. 10A. The battery, E_p, puts a positive charge on the plate, and the meter MA measures the current (electron flow) through the circuit. For a given temperature of the cathode, the higher the value of the plate voltage source, E_p, the greater will be the flow of current. You can tabulate the various values of current that are obtained for different voltages and then plot them on a simple graph, as at Fig. 10B. The plot of these values is practically a straight line from the "0" point up to a point marked "saturation." (Down near the "0" point there will be some slight curvature.) The saturation point indicates that, for the given cathode temperature (and cathode material), we can pass no more current through the diode, regardless of the plate voltage. Why? Because all of the electrons emitted by the cathode are finding their way to the plate. With no more electrons available, we can't increase the current, since the flow of electrons *is* the current. How can the current be increased? By making more electrons available, which means running the cathode at a higher temperature (or using a different cathode material). If we increased the temperature of the cathode and made another series of measurements, we would obtain a curve similar to that of Fig. 10B except that the saturation point would come at a higher plate voltage.

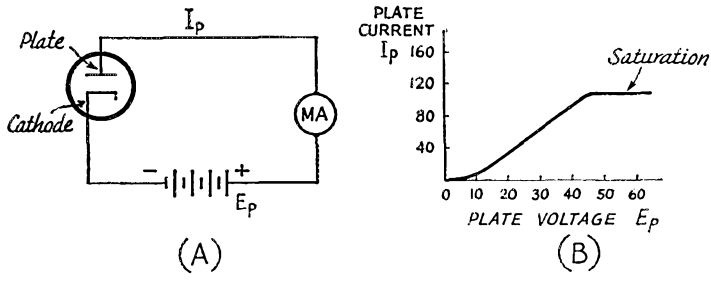


Fig. 10 — When a diode (two-element vacuum tube) is connected in series with a voltage source and meter (A), the current through the tube depends upon the value of the voltage, up to the saturation point (B). Increasing the cathode emission will raise the saturation point to a higher plate voltage.

* Assistant Technical Editor, *QST*.

† See May and June *QST* for Parts I and II.

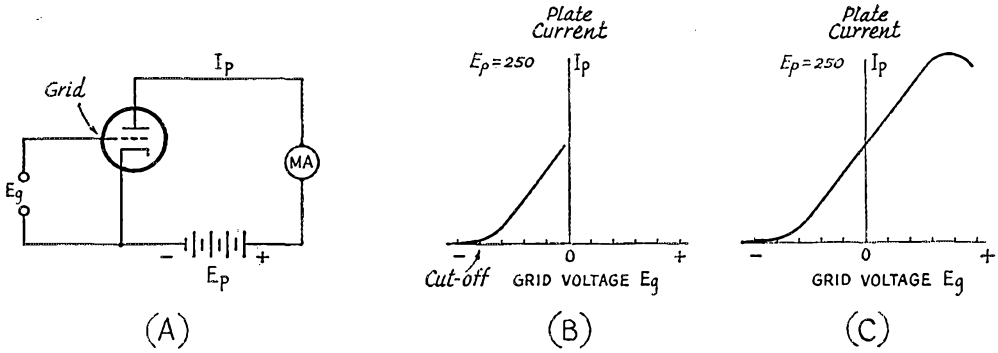


Fig. 11 — A grid introduced between the cathode and plate (A) gives a triode (three-element vacuum tube). For a given plate voltage, the plate current is determined by the grid voltage (B) and (C).

In practice, cathodes are always run hot enough so that "*temperature* saturation" such as this does not take place. "Saturation" is introduced here so that it will not be a stranger later on.

You may wonder why *all* of the electrons are not attracted at low voltages, so that temperature saturation would be reached just as soon as any positive charge existed in the tube. The reason ties back to your laws of electrostatics: the lower values of positive charge (voltage) are not sufficient to overcome completely the high value of negative charge represented by the space charge. In other words, if the positive charge represents 5 units and the space charge is 25 units, only 5 units will be moving from the space-charge region. Boost the positive charge up to 10 units and you will be moving 10 units away from the vicinity of the cathode, and so on. When you get up to 25 positive units, you're dragging all you can from the cathode at this temperature.

From your practical knowledge of such circuits, you know that if you run a diode as in Fig. 10A, the temperature of the plate will increase with the flow of current through the circuit. Since this is a series circuit (all parts connected in series, as opposed to parallel) the current in one part of the circuit must be the same as in any other part of the circuit. Why, then, does the tube plate heat up, and not the battery or meter? You might say that the "plate has resistance," but you know that it is made of a good conductor like the wires connecting the other parts of the circuit. So, to explain the plate heating, you have to appreciate first that the electrons acquire a velocity in moving from the cathode to plate. This velocity becomes greater as the voltage difference (for any given distance between cathode and plate) is made greater. The electrons have mass, and now velocity, and a moving mass has something called "*kinetic* energy," as anyone who has stopped a baseball barehanded can testify. In the vacuum tube, the fast-moving electrons are brought to a screeching halt at the plate, and the kinetic energy is converted into heat when the electrons strike the plate.

[1] Actually, the action is not instantaneous — it does take a finite time for electricity to act. The speed in a straight wire is close to the speed of light, however. — Ed.

The electrons don't hit the plate and then fall to the bottom of the vacuum tube, the way a lot of baseballs would. Minus their kinetic energy, they replace the electrons that were removed from the plate when it was charged positively by the battery. The electrons that are removed from the plate "nudge" each other back down the wire the instant the battery is connected, and others are doing the same thing in the wire from the battery to the cathode. There has to be "equilibrium" (balance) around the circuit at any instant, so any tendency for unbalance of charges in any part of the circuit is immediately [1] counteracted through the circuit. The electrons in the tube actually travel the distance from space-charge area to plate to maintain the balance of charges, but the "current" through the wires is only a balancing of charges maintained by movement of electrons from atom to atom, a relatively short hop.

The heat developed at the plate can be calculated from the power in watts (volts × amperes) represented by the plate current and the voltage from cathode to plate. This heat is dissipated by radiation (and some conduction through the plate connection), and obviously a larger plate will dissipate more power because its area is larger and it can radiate more heat.

A diode has no ability to "amplify" signals, of course, and it was only brought in to furnish background for the vacuum tubes that are used as amplifiers. The diode finds use as a rectifier, in power supplies and in receivers.

The Triode Vacuum Tube

If we take the diode of Fig. 10A and introduce between its cathode and plate a mesh of wires (called a "grid"), we have a three-element vacuum tube, or "triode." It is shown in Fig. 11A, with the grid drawn "end on" to remind you that it is not a solid sheet like the plate. Let's make the plate voltage some fixed value like 250 volts, and see what the effect of different voltages between cathode and grid will be. If we make this grid voltage, E_g, some high value and connect it so that the negative terminal goes to the grid (and the + to the cathode), we will find that no plate current flows and the meter will

indicate "0" current. The reason is the basis for all vacuum-tube amplifier action. You will recall that it was the positive electric field of the plate extending over into the space-charge region that made the current flow through the diode. A small negative charge on the grid can neutralize the effect of a higher positive charge on the plate, since the field from a charged body drops off with distance, and the plate is farther from the space-charge region than the grid is. If we reduce the value of the grid voltage (make it lower but still with the negative terminal to the grid), we will reach a point where plate current starts to flow. This point, of course, is where the negative charge of the grid is not sufficient to overcome the positive charge of the plate that can be felt at the space-charge region. As we make the grid voltage still lower, still more plate current will flow.

A plot of the values we have obtained so far might look like Fig. 11B. This is a plot of "grid voltage *vs.* plate current" for a plate voltage of 250. The grid can also be connected to the + terminal of the grid-voltage source, but so far we have no data on what happens and so we can't add it to the graph. You will see that the values do not plot as a straight line — at low values of plate current there is some curvature, but as the plate current increases the graph tends to straighten out. The value of grid voltage that "cuts off" (reduces to 0) the plate current is called the "cut-off" grid voltage for this particular value of plate voltage. It would be lower for lower values of plate voltage and higher for higher plate voltages.

As we continue to make the grid voltage less negative, we will eventually reach a grid-voltage value of 0, and to continue, we must make the grid voltage + with respect to the cathode. As we do this, and plot the results, we will obtain the graph (or "characteristic") of Fig. 11C. The plate current continues to increase as the grid voltage increases, until finally the plate current reaches saturation. This "*plate* saturation" is a different type than the "temperature saturation" mentioned earlier. It takes place when the attraction of the grid voltage is equal to or greater than that of the plate voltage. In other words, if the + field of the grid is stronger at the space-charge region than that of the plate, the electrons will tend to ignore the plate and be attracted to the grid. The plate current first flattens out and then decreases, as indicated. We can get more plate current at this "saturation" value of grid voltage by increasing the plate voltage — that would be "operating on another characteristic" (one drawn for this new and higher value of plate voltage).

Something else happened to the tube when we made the grid positive with respect to the cathode. When the grid was negative with respect to the cathode, no electrons could go to the grid and consequently no current could flow in the grid circuit. But when the grid is positive with respect to the cathode (even by only a fraction of a volt), electrons can find their way to the grid. This represents a current, and thus current flows in the grid circuit. With current flowing, *power* is taken from the grid-voltage source, just as power is taken from the plate-voltage source whenever plate current flows. Consequently, a vacuum tube requires no grid power when the grid voltage is negative, but it does require grid power when the grid is positive.

Before we leave this discussion of simple vacuum-tube operation, let's take a last look at this business of grid power. We will use the circuit of Fig. 11A, except that we will add a large resistor, R, in series with the grid. This revised circuit is shown in Fig. 12. The two batteries in the grid circuit have the same voltage — the

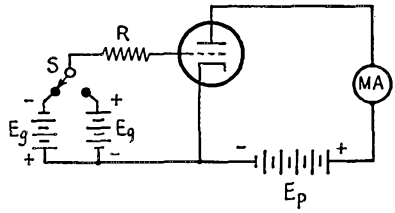


Fig. 12 — If there is resistance in series with the grid of a vacuum tube, an applied voltage will appear at full value on the grid if the voltage is negative with respect to cathode, but it will be reduced by the voltage drop through the resistance R if the applied voltage is positive.

switch S merely changes the polarity at the grid. If the batteries are each 10 volts, for example, we know that switching S to the left puts −10 volts on the grid of the tube. What happens when we switch to the right? Your first guess might be that it places + 10 volts on the grid, but you would be wrong. With the grid positive, some current will flow through R, and consequently there will be a voltage drop across R. Thus, the actual voltage on the grid will be the + volts *minus* the voltage drop across R. Obviously, we want a minimum of resistance in series with the grid when the grid is drawing current, or we won't be applying to the grid the voltage we think we are. This isn't just an academic point — it's something to watch out for all the time.

There are, of course, tetrode (four-element) and pentode (five-element) type tubes that are used for audio amplifier and modulator work, but we can save a discussion of their operation and merits for some other time. They use a control grid that behaves much the same way the grid works in a triode, and they use a cathode and a plate. Extra grids make up the additional elements.

Tube Ratings

Earlier, it was mentioned that practically all vacuum tubes are run at a cathode temperature sufficient to deliver more electrons than will normally be required, and consequently we never run into "temperature saturation" with a properly-operated vacuum tube. Now let's look at some of the limiting factors of vacuum-tube operation and how they are determined.

Handbooks and tube manuals furnish information on the proper operation of vacuum tubes.

The correct filament (or heater) voltage is listed. If the filament (or heater) voltage is maintained at this value (or within ±5 per cent, usually) the cathode will be at a temperature sufficient for all normal uses of the tube. The manufacturer has determined this value by experiment and design, and one has a right to expect good tube life when this value is maintained — and other ratings are not exceeded.

Another important factor in determining what a tube can or cannot do in the way of power output is the "plate dissipation." You will recall that this depends upon the area (and construction) of the plate — the book rating is one that the manufacturer believes can be maintained without injury to the tube. Vacuum tubes are built with plate dissipations ranging from a watt or so — small receiving tubes — to large transmitting tubes capable of dissipating hundreds or thousands of watts. As we will see later, the plate-dissipation figure is not the maximum input that can be run to a tube — it is the power that can be safely dissipated by the plate. We can run more power than this to the tube if we use up the additional power in some other way, such as converting it into audio or r.f. power and delivering it to a load.

Tubes also have grid-dissipation ratings, for control and screen grids, and these must also be respected if the tube is to give reasonable service.

The factor that determines how much of the d.c. input power supplied to the plate circuit of a tube is recovered as useful audio or r.f. power, and not wasted as plate dissipation, is the *efficiency* of the tube. The efficiency depends upon how the tube is operated, as will be explained later. Suffice to say, a tube operated at 70 per cent efficiency delivers .7 of the plate circuit d.c. input as power out of the tube and dissipates the remainder (30 per cent) at the plate.

How a Vacuum Tube Amplifies

So far we have merely looked at how the grid voltage of a vacuum tube controls the plate current. If the tube is to be used as an amplifier, how do we go about it? To illustrate, take the circuit of Fig. 13A. It is somewhat similar to Fig. 11A, except that we have added a resistor R in series in the plate circuit, and a transformer is used in the grid circuit. The alternating-voltage signal, E_g, to be amplified is introduced through this transformer and, to simplify any arithmetic, we will make the turns ratio of the transformer 1:1, so that there will be no "step up" or "step down" through the transformer. The voltage of the "bias" battery, E_g, will be selected as that value equal to about one-half the cut-off voltage, as indicated in Fig. 13B. At this grid voltage, the value of plate current will be I_p, found by moving vertically from this grid voltage up to the characteristic and then horizontally across to the plate-current scale. This value of plate current is called the "static plate current" — "static" in this sense means "with no signal" — and the value of E_g, the "grid bias," determines it.

When a signal is applied through the transformer — e.g., 3 cycles of a sine wave — this varying voltage adds to or subtracts from the bias voltage. When the instantaneous grid voltage becomes more negative, the plate current is decreased, and when the grid voltage becomes less negative, the plate current is increased. The plate current, therefore, follows the changes in the grid voltage, as shown by the portion marked "output current" in Fig. 13B. The voltage drop across R, which is being measured by V (a fast-moving voltmeter like an oscilloscope), changes in the same manner. If R is large, a small change in the plate current develops a large voltage across R. Thus a small signal voltage at the input becomes a large signal voltage at the output, and the tube "amplifies" the signal.

There are several things to remember about this type of amplifier. The grid circuit took no power, except what little might be dissipated in the resistance of the primary of the transformer. The plate current, I_p, if read with a *d.c.* meter, would show no change from the static value, with or without signal, because the d.c. meter can't follow the rapid changes in current, and the *average* change is 0. If we were to increase the value of E_g, we might swing the grid far enough to get on the curved portion of the characteristic, or into the grid-current region, or both. In such a case, the plate current indicated by a d.c. meter would not be the same with or without signal. Swinging on to the curved portion of the characteristic would result in *distortion* of the negative half-cycles of plate current. Swinging into the positive grid region might distort on the positive

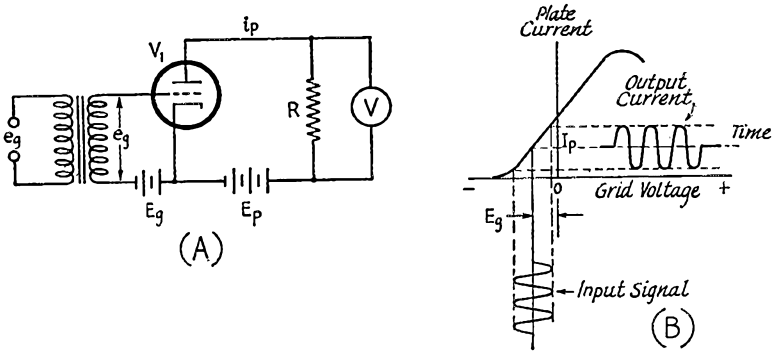


Fig. 13 — (A) A vacuum tube will "amplify" a signal if the signal is applied to the grid and a suitable "load" (R in this case) is provided in the plate circuit. (B) The action can be traced through by applying the signal to the "characteristic" of the tube.

half-cycles of plate current because the grid would take power. The grid voltage might not be maintained, through the inability of the signal source to furnish the necessary power.

An amplifier of this type, when working within the distortion limits, is called a "Class A amplifier." A Class A amplifier is one in which the output voltage waveform is a faithful reproduction of the input voltage waveform and there is no change in plate current as measured by a d.c. meter. Commonly, there is no grid power required, although this is not a qualification.

Class B Amplifiers

A Class A amplifier can, of course, be designed to furnish considerable audio power, but it is not a very efficient way to obtain large amounts of audio power. Class A amplifiers usually run about 20 or 25 per cent efficient with tolerable distortion, and so we must cast around for a more efficient means for generating audio power, unless we want to spend all of our money for modulator tubes and power supplies. An amplifier running Class A and using a tube with a plate dissipation of 40 watts would deliver only 10 to 13 watts, with a power supply furnishing 50 to 53 watts. Most of the power goes to heat the tube plate.

Of course, we can operate more tubes in a Class A amplifier by connecting two or more in *parallel* (grids tied together, plates tied together, and cathodes tied together). Connected this way, two tubes would give twice as much output as one tube, but with twice as much d.c. power input supplied to them. In other words, the efficiency would remain the same.

Or we can operate the two tubes in push-pull, as shown in Fig. 14. Here you will see that a transformer has been substituted for the plate

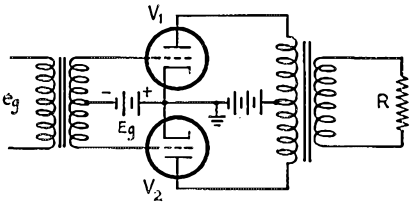


Fig. 14 — For greater output, two tubes can be connected in "push-pull."

load resistance, *R*, of Fig. 13A, but aside from this change, the connections to V_1 are the same in Fig. 14 as they are in Fig. 13A. But in Fig. 14, V_2 is connected to other parts of the grid- and plate-circuit transformers. The net result is that when the plate current in V_1 is increasing, because the grid voltage is going less negative at that instant, the plate current in V_2 is decreasing because the grid voltage to that tube is going more negative. At another part of the signal cycle, the conditions would be reversed, and the plate current would be decreasing in V_1 and increasing in V_2. The term "push-pull" is quite descriptive of the action.

In the plate circuit, the net effect of the varying currents through the halves of the transformer primary is to induce in the secondary a signal that corresponds to the grid-circuit signal.

Now suppose that we increase the value of E_g to the point where very little plate current is drawn by the tubes when there is no signal. Then when signal is applied, first one tube conducts, because its grid is driven less negative with respect to cathode, and then the other tube conducts. The tube whose grid is driven more negative of course draws no plate current during this time. Under these conditions, we have an amplifier where first one tube contributes to the output and then the other tube contributes while the first one idles. You can visualize this by placing two tube characteristics "back-to-back," as in Fig. 15. Here you can see that V_1 con-

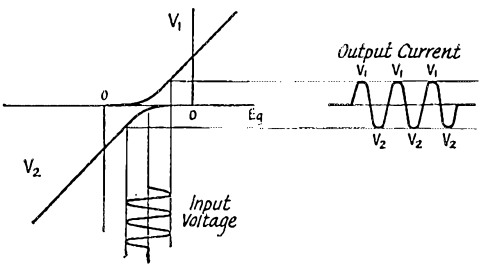


Fig. 15 — The characteristics of two tubes connected in push-pull and biased near cut-off. The tubes "take turns" supplying the output current, and consequently have time to cool off between half-cycles.

tributes half of the time and V_2 contributes during the remainder of the time. Since there is some curvature to any practical tube characteristic, the two characteristics are aligned so that at low signal levels both tubes are drawing a little plate current all of the time.

Tubes operated like this work at a higher efficiency than they do in a Class A amplifier, because the tube is not conducting during all of the signal cycle, and the tube plate can "cool off" between half-cycles. Furthermore, the static plate current is lower than in Class A operation, so the tube heating under no-signal conditions may be less. Amplifiers of this type are called "Class B," and their theoretical efficiency can run up to 78 per cent. In practice, it may run as high as 60 per cent, since there are no tubes built with an "ideal" characteristic, and the necessary output transformer will dissipate some of the power output from the tube. In all instances where maximum power is sought from the tubes, it is necessary to drive the grids into grid current over part or all of a half-cycle, and this can be done provided one remembers that it is important to maintain the grid-voltage waveform while the grid is taking power.

By definition, a Class B amplifier is one in which the tube conducts (has plate current flowing) over only half of the signal cycle and in which the output power varies as the square of the grid voltage. Obviously, the tubes in Fig. 15 are not quite adhering to this definition, because the curvature of the characteristics required that

(Continued on page 126)

Hints and Kinks For the Experimenter

V.T.V.M. POWER SUPPLY FOR THE G.D.O.

HERE is a possibility of turning tables that some amateurs may not have thought of.

Since a vacuum-tube voltmeter can be used as the indicator for a homemade grid-dip meter, it is only logical that the power supply for the v.t.v.m. be used to furnish power for the g.d.o. Seems fair enough, doesn't it?

— *Luke McCloud, K2DDM*

EARPHONE PADS

GERRARD INDUSTRIES, Jackson Heights, N. Y., are manufacturing telephone ear pads that work well with regular amateur-type headphones. The pads sell for 25 cents each and are distributed through some of the 5- and 10-cent stores. They are soft, washable, and carry an adhesive which really holds them in place against the 'phones. Because the material is easily cut, it is possible to trim the pads for almost any size 'phones.

— *John Messler, W8MUL*

REVAMPED AUDIO CIRCUIT FOR VIKING TRANSMITTERS

BECAUSE of low output from a microphone or the desire to modulate when located some distance from the microphone, many amateurs appreciate information directed at increased output from existing audio gear. The following is a report of work done on the audio circuits of a Viking I transmitter used here at W6ZLW. Prior to the modification, and when using my particular microphone, it was necessary to talk loud and *close* with the gain turned full on in order that adequate modulation might be obtained. With the new speech layout, it is possible to obtain 100 per cent modulation while talking at a normal level when located 4 or 5 inches away from the microphone and with the gain control set at the approximate middle of the scale. On-the-air reports indicate that the quality of the system is still excellent even though the low-level stages have been completely done over.

Fig. 1 shows the new tube line-up that is used to replace the original speech-amplifier and driver circuits. One half of a Type 12AX7 is used as the input tube and the second section of the envelope is used to excite a 12BH7 dual triode (connected in parallel), which in turn drives the 807 modulator for the transmitter. The original gain control for the rig, R_1 of Fig. 1, is connected in the grid circuit of the second half of the 12AX7. Incidentally, a 12AU7 may be substituted for the 12BH7 with very little difference in actual operation. However, no suitable substitution for the 12AX7 has been found.

When making the modification, it is necessary to replace the old 6AU6 tube sockets with 9-prong jobs. Be sure to use shielded sockets and place them exactly where the original ones were located (enlarge the old mounting holes). When removing components, do so with care because several parts can be used in the new layout. Make certain that the 12BH7 occupies the spot previously used by the 6AU6 driver tube. Also, notice that shielded wire is used between the microphone jack and the 0.005-μf. coupling capacitor.

Several other W6s have been highly pleased with the results obtained by the above means. Furthermore, no one who has faithfully followed instructions pertaining to tube layout reports feed-back difficulties at any of the frequencies for which the rig is designed. On the other hand, failure to follow instructions has resulted in audio problems.

— *William T. Seeley, W6ZLW*

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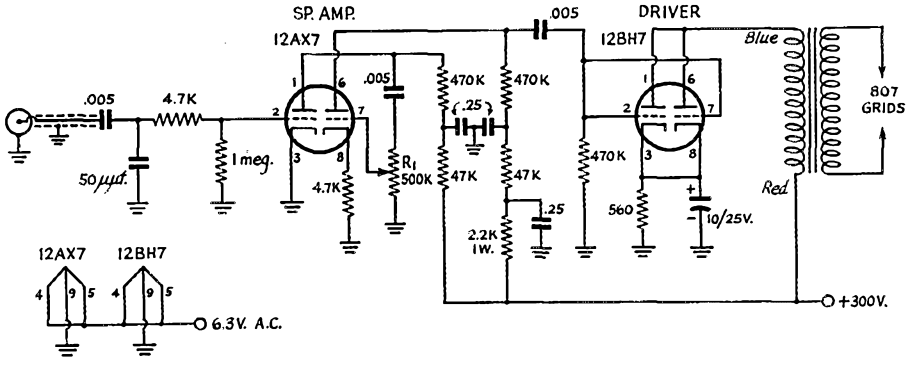


Fig. 1 — W6ZLW uses this low-level speech arrangement to drive the 807 modulator of a Viking I transmitter. Unless otherwise specified, capacitances are in μf.

50-Kc. Markers from a 100-Kc. Crystal

Extending the Usefulness of a Crystal Standard

CHARLES ATWATER, W2JN of Upper Montclair, N. J., recently sent us a circuit of the interesting secondary frequency standard he is using at his station. This standard is different from the usual 100-kc. crystal standard in that its harmonics appear every 50 kc. instead of every 100 kc. When the output of the oscillator is coupled to the input of a receiver, the signals have sufficient strength to be heard as high as 50 Mc. One can readily see the advantage of having the additional 50-kc. markers for checking subband edges and for making spot checks within a band.

The standard is easy to build, and it can be completed in a few hours. As can be seen from the circuit in Fig. 1, only one tube is used, and power for the unit can be taken directly from the receiver. As a matter of fact, the completed unit shown in the photographs is small enough to be mounted inside most receivers. A s.p.s.t. toggle switch should be connected in series with the B+ lead, to turn the unit on and off.

Construction

The unit shown in the photographs was built on a 1¼ × 2½ × 3½-inch chassis made from a piece of scrap aluminum. This small chassis easily accommodates all of the components.

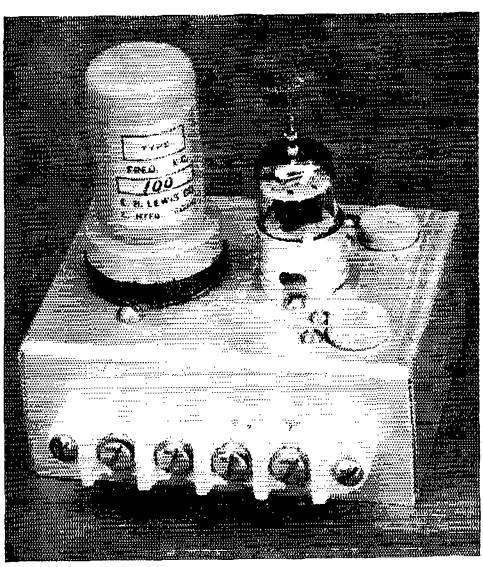
The two small trimmer condensers, C_1 and C_2, are mounted on either side of the 7-pin miniature tube socket. Although a special crystal socket might be used in some cases, a regular octal tube socket was used here because most 100-kc. crystal holders have either a regular octal tube base or ½-inch spaced pins that will fit an octal socket.

The 10-mh. r.f. choke (a National R-100S) is mounted horizontally, parallel to the side of the chassis opposite the terminal strip. The terminal strip isn't essential, of course — some constructors might prefer to use tie points and a length of 4-wire cable through a rubber grommet in the side of the chassis.

The oscillator requires 150 volts or so at about 10 ma. for the plate supply, and 6.3 volts for the heater. When the unit is first connected to a power supply, it is quite likely that only signals every 100 kc. will be heard. With the b.f.o. turned "on" in the receiver, check a few of the 100-kc. points across a low-frequency band in your receiver, and then leave the receiver set halfway between two of these points. Now slowly tune C_1 through its range. You should pass through a point where the 50-kc. signals will be produced and will be heard in the receiver. Once this setting for C_1 has been found, the condenser is left in that particular adjustment. When working on the oscillator, it was found that there were some settings of C_1 that gave signals every few kc., but there was only one setting that gave the desired 50-kc. signals.

When the correct setting for C_1 has been found, the standard should be checked against WWV to make sure that it is exactly on frequency. Tune WWV in on the frequency where they can be heard best at the particular time (2.5, 5.0, 10.0 or 15.0 Mc.) and then adjust C_2 so that the oscillator harmonic is zero beat with WWV. The standard is now ready to use.

Several different makes of crystals were tried, and some worked better than others. The Bliley KV-3 and the E. B. Lewis 100 were two types that produced the 50-kc. signals without any difficulties. Some crystals may not oscillate with



This little unit uses a 100-kc. crystal and delivers marker signals every 50 kc. up to 50 Mc. It is small enough to be mounted inside of most receivers and the power "borrowed" from the receiver supply.

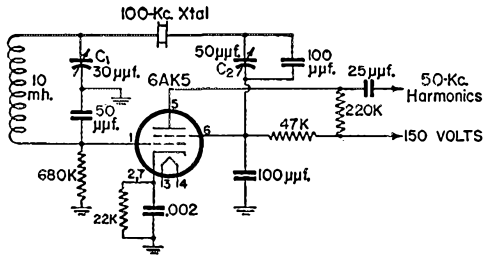


Fig. 1 — Circuit diagram of the 50/100-kc. frequency standard.
C_1 — 5- to 30-$\mu\mu$f. ceramic trimmer (Centralab 827-C).
C_2 — 8- to 50-$\mu\mu$f. ceramic trimmer (Centralab 827-D).

100 $\mu\mu$f. across C_2, and in this case a 47- or 22-$\mu\mu$f. condenser should be substituted.

The voltage stability of this particular unit was quite good, and varying the plate voltage from 150 to 300 caused only a barely perceptible change at 29 Mc.

The FCC requires that an amateur station must have means for measuring the transmitter frequency, to insure operation within an amateur band. This simple oscillator will meet that requirement with a minimum of cost and effort.

Circuit Operation

In the note accompanying the circuit, W2JN says, "Believe this circuit falls in the category of a lightly-synchronized type of relaxation oscillation, wherein the inherent poor frequency stability of the pulse signal determined by the *RC* circuit (C_1 and the 0.68-megohm resistor) is brought in step by the synchronizing signal produced by the 100-kc. crystal oscillator at the submultiple, or half-frequency, rate.

"Seely[1] gives an explanation which I think applies. The condition when a sine wave from the crystal oscillator is used for a synchronizing signal is substantially as follows: At the instant when the synchronizing voltage is suddenly applied, it is supposed that the tube is conducting. The synchronizing voltage causes the cathode voltage to rise, so that conduction is decreased. This leads to regenerative action, and the tube is quickly cut off. This switching action causes the tube to stop conducting at a time earlier than would be the case for the free-running crystal oscillator. The voltage on the grid will follow its normal exponential curve until it intersects the cut-off curve, which has the assumed sinusoidal form, and switching action takes place. If it is assumed that during conduction the grid-cathode voltage remains constant at some small positive value, the presence of an added negative voltage on the cathode from the pulse will cause the grid voltage to follow the cathode voltage. When the cathode voltage begins to rise, conduction is decreased and again regenerative action takes place.

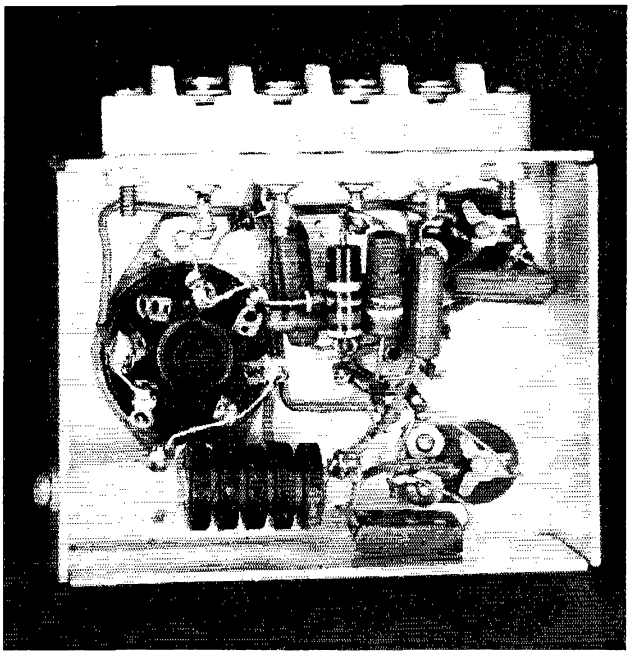
"The trigger circuit that sets up the 50-kc. output signal is composed of the *RC* network (the 680,000-ohm resistor, and C_1 and the 50-$\mu\mu$f. condenser in parallel).

$$f_{cps} = \frac{1}{6.8 \times 10^5 \times 55 \times 10^{-12}} = 27 \text{ kc. approx.}$$

Terman states: 'For generation of saw-tooth waves or pulses, the frequency at which the coil (or crystal) oscillates should be higher than the frequency of the relaxation oscillator.' It seems that this condition is satisfied here."

— *L. G. M.*

[1] Seely, *Electron-Tube Circuits*, McGraw-Hill Book Co., N.Y., N.Y.

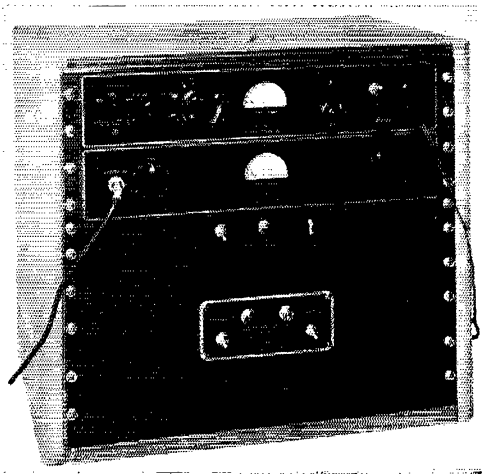


A bottom view of the frequency standard.

• Recent Equipment —

The 90801 Exciter-Transmitter

THERE was once a 90800 exciter-transmitter, popularly known as the "Millen Exciter." Its successor, the 90801 shown in the accompanying photographs, retains a distinguishing feature of the predecessor — relay-rack construction using a 3½ × 19-inch panel. The physical resemblance stops just about right there, since the new unit is a completely enclosed, bandswitched job while the old one used plug-in coils in the unshielded construction that sufficed in the days before TV.



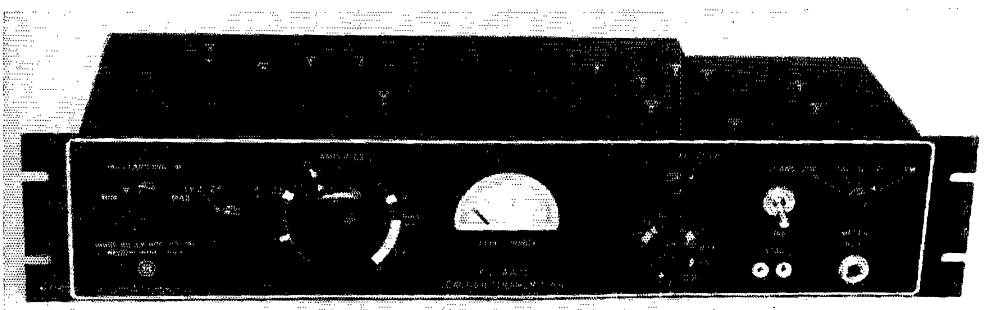
The 90801 and its companion 40-watt modulator mounted, with power supply, in a table-size rack cabinet. This coördinated group of units forms a complete 'phone transmitter, the 90801 being an r.f. unit only.

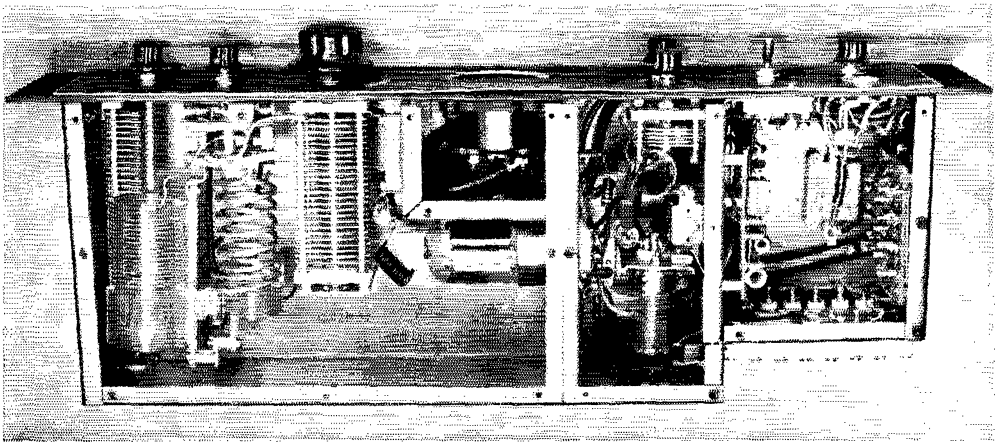
However, aside from panel size the 90801 does have a number of points in common with the 90800. It uses two tubes, a crystal oscillator and a tetrode amplifier that can also be used as a frequency doubler. It does not have an integral power supply, and so may be used with any appropriate power equipment that may be on hand. And its circuit, as was also the case with the 90800, is based on a *Handbook* design. The tubes (not included with the transmitter as marketed) are a 5763 and a 6146.

The r.f. circuit is practically identical with the one shown on page 164 of the 1954 *Handbook*, and so is not reproduced here. It has the same harmonic-output type crystal oscillator circuit, with provision for VFO input and a tapped-coil plate circuit for band changing. The 6146 plate circuit, including the output coupling arrangement, is similar, but two sets of plate and coupling coils are included. One set is used for 3.5 and 7 Mc., the other for 14, 21, 27 and 28 Mc. The frequency range, approximately 2 to 1 in each case, is covered by setting the plate tank condenser near minimum capacitance for the higher frequency and near maximum capacitance for the lower frequency. The coil set to be used is selected by a panel switch which is separate from the oscillator band switch. Thus any of the crystal frequency *vs.* output frequency combinations suggested with the *Handbook* transmitter can be used. The output circuit constants are designed for working into a flat coaxial line.

The control and metering circuits are likewise substantially the same as those in the *Handbook* circuit. A single meter is used, by means of a switch, for measuring oscillator plate current, amplifier grid, screen and plate current (not cathode current), and as a 1000-volt voltmeter for checking the high voltage. The only thing missing in this department is provision for measuring the low voltage and for using the voltmeter externally. A "tune-transmit" switch using the *Handbook* scheme is included. There are also a number of added conveniences which contribute to flexibility: D.c. leads from the oscillator grid,

Minimum panel height for a compact rack-mounted transmitter assembly is a feature of the new 90801 exciter-transmitter. The transmitter is bandswitching on all bands from 3.5 through 28 Mc. The circuit is patterned after a *Handbook* design using a 5763 crystal oscillator and 6146 amplifier.





The chassis of the 90801 is divided off into several compartments, both for interstage shielding and for TVI reduction. The plate meter is in such a compartment, as are also the terminal strips and resistor boards at the right. Tubes and r.f. circuits are totally enclosed in the chassis. This view is with the bottom plates removed.

oscillator cathode and 6146 grid and cathode are brought out to separate terminals on a strip at the rear so a choice of keying methods is available. For example, the 5763 cathode can be grounded and the 6146 keyed separately, or the two cathodes can be tied together and the two tubes keyed simultaneously; alternatively, the oscillator can be keyed alone and the 6146 operated with fixed bias; or both tubes can be given fixed bias and their cathodes grounded in case the transmitter is to be driven by a keyed VFO. Also, a dropping resistor suitable for supplying the 5763 from the high-voltage supply is included for use when the amplifier is not keyed.

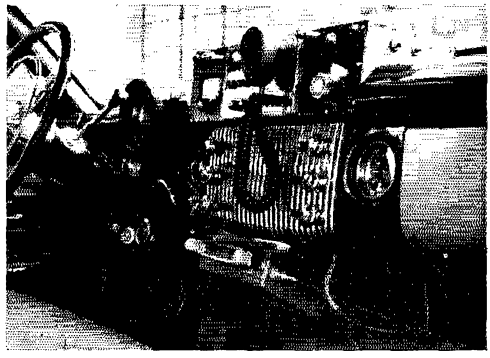
The heaters require 6.3 volts at 2 amperes. For keyed c.w. or plate-and-screen modulated 'phone, a low-voltage supply of 250 to 300 volts at not more than 35 ma. is needed, in addition to a high-voltage supply delivering 400 to 750 volts (600 volts maximum for 'phone) at currents up to 150 ma. (An "economy" supply such as was incorporated in the *Handbook* transmitter may of course be used.) The same power supply system may be used for unkeyed c.w., where the unit serves as a continuously operating exciter for a high-power amplifier, but the separate low-voltage supply may be omitted in this case by using the dropping resistor mentioned above to drop the voltage to the 5763. This arrangement can be used only when the exciter is not keyed, since cutting off the plate current of either the 6146 or 5763 would put excessive voltage on the 5763. The current demand on a single supply is between approximately 100 and 180 ma., depending on the input the operator wants to run within the ratings of the 6146.

The internal construction of the transmitter is shown in the photographs. The chassis is copper-plated steel, divided into compartments for stage shielding and for reduction of harmonic radiation. Tubes are mounted horizontally, ventilation holes above and below the 6146 being provided. D.c. leads are by-passed for filtering v.h.f. harmonics and are shielded in accordance with current practice in amateur transmitter construction.

A companion modulator (90831) is available, as is also a power supply (90281) having adequate output for both the transmitter and modulator — 500 to 750 volts at currents up to 235 ma. — for 'phone-only operation. A rack assembly of these three units is shown in one of the photographs. There is also a low-voltage supply (90201) which delivers 250 volts at 115 ma., 105 volts regulated, and a low-current negative supply of 105 volts, together with a filament voltage. This will suffice for the low-voltage requirements of both the transmitter and modulator, in cases where both 'phone and c.w. are to be used.

—*G. G.*

Strays



This "high level" type of mobile-gear mounting is favored by W1ZBD. Francis obtained a spare dash cowling for his '53 Buick and cut it to accomodate his mobile station. When trade-in time comes along, the original cowling will be reinstalled. Although not very evident in this photograph, the height of the installation is far below that which would impair visibility.

Happenings of the Month

ELECTION INJUNCTION AGAIN DENIED

As previously reported in this department, several director candidates in our 1953 autumn elections challenged the decision of the ARRL Executive Committee in ruling them ineligible on lack of membership continuity for the required four years, and sought both a temporary and a permanent injunction to declare the elections invalid and hold new ones. As outlined on page 44 of April *QST*, Judge Shapiro of the Superior Court at Hartford denied the request for a temporary injunction, holding that the Committee had properly interpreted and applied the requirements of the ARRL Articles of Association. The hearing on the request for a permanent injunction was held in mid-May before another section of the court, and Judge Roberts subsequently issued a similar finding, denying the plaintiffs' request and again upholding the actions of the Executive Committee.

The Court held that "in order to be eligible for election as a director of the corporation, (a nominee) must have been a member of said corporation for at least four years at the time of his election at least. This qualification was not possessed by the plaintiff, James W. John (W3OMN)." The Court further said, "A reasonable and logical interpretation of the appurtenant Articles of Association and By-Laws of the defendant corporation appear to substantiate the claim of the defendant."

Concerning the remaining plaintiffs, Paul M. Bossoletti, WØGZD, and John W. Gore, W3PRL, the Court indicated that since these candidates did not possess four-year continuous membership immediately prior to election, and since the plaintiffs' interpretation (of four years' membership at any time, not necessarily the immediately-preceding four years) would lead to some illogical situations, the Court "cannot agree with the plaintiffs' interpretation of the Articles of Association and finds that none of the plaintiffs were eligible for the offices sought."

EXAMINATION SCHEDULE

The Federal Communications Commission will give amateur examinations during the second half of 1954 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 from 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.: October 2
Amarillo, Texas: September 23
Anchorage, Alaska, 52 U. S. Post Office Bldg.: By appointment.
Atlanta, Georgia, 411 Federal Annex: Tuesday and Friday at 8:30 A.M.
Baltimore 2, Md., 508 Old Town Bank Bldg.: Monday through Friday. When code test required, between 8:30 A.M. and 9:30 A.M.
Beaumont, Texas, 329 P. O. Bldg.: Monday through Friday except Thursday only when code test required.
Birmingham, Ala.: September 8, December 8.
Boise, Idaho: Sometime in October.
Boston, Mass., 1600 Customhouse: Wednesday through Friday, 9:00 A.M. to 2 P.M.
Buffalo, N. Y. 328 P. O. Bldg.: Thursday.
Butte, Mont.: Sometime in September.
Charleston, W. Va.: Sometime in September and December.
Chicago, Ill., 826 U. S. Courthouse: Friday.
Cincinnati, Ohio: Sometime in August and November.
Cleveland, Ohio: Sometime in September and December.
Columbus, Ohio: Sometime in July and October.
Corpus Christi, Texas: September 9, December 9.
Dallas, Texas, 500 U. S. Terminal Annex Bldg.: Monday through Friday, except Tuesday only when code test required.
Davenport, Iowa: Sometime in July and October.
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays, 8 A.M.
Des Moines, Iowa: Sometime in July and October.
Detroit, Michigan, 1029 Federal Bldg.: Wednesday and Friday.
El Paso, Texas: September 28.
Fort Wayne, Ind.: Sometime in August and November.
Fresno, Calif.: September 15, December 17.
Grand Rapids, Mich.: Sometime in July and October.
Hartford, Conn.: September 14 and 15.
Hilo, T. H.: October 5.
Honolulu, T. H., 502 Federal Bldg.: Monday through Friday.

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The Amateur Radio Club of Savannah, Ga., in March staged on WTOC-TV a program dealing with local TVI problems and based on the ARRL script. *L. to r.:* Frank Martin, W4JIW, chairman of Savannah TVI Committee; Lt. David A. Davenport, W4UZL, TVI Committee; Andrew Bahlay, W4KPI, FCC Engineer-in-Charge, Savannah; Dave Randall, announcer.

♦

Houston, Texas, 324 U. S. Appraisers Bldg.: Tuesday and Friday.
Indianapolis, Ind.: Sometime in August and November.
Jackson, Miss.: September 8, December 8.
Jacksonville, Fla.: October 9.
Jamestown, N. D.: October 13.
Juneau, Alaska, 7 Shattuck Bldg.: By appointment.
Kansas City, Mo., 3100 Federal Office Bldg.: Friday.
Klamath Falls, Oregon: Sometime in November.
Knoxville, Tenn.: September 22, December 15.
Lihue, T. H.: October 19.
Little Rock, Ark.: July 14, October 6.
Los Angeles, 539 U. S. Post Office and Courthouse: Wednesday, 9 A.M. and 1 P.M.
Louisville, Kentucky: Sometime in November.
Memphis, Tenn.: July 9, October 8.
Miami, Fla., 312 Federal Bldg.: Thursday.
Milwaukee, Wisconsin: Sometime in July and October.
Mobile, Ala., 419 U. S. Courthouse and Customhouse: Wednesday and by appointment.
Nashville, Tenn.: August 4, November 3.
New Orleans, La., 400 Audubon Bldg.: Monday through Friday except Monday through Wednesday only at 8:30 A.M. when code test required.
New York, N. Y., 748 Federal Bldg., 641 Washington St.: Monday through Friday.
Norfolk, Va., 402 Federal Bldg.: Monday through Friday except Friday only when code test required.
Oklahoma City, Okla.: July 15 and 16, October 21 and 22.
Omaha, Nebr.: Sometime in July and October.
Philadelphia, 1005 U. S. Customhouse: Monday through Friday, 8:30 A.M. to 2 P.M.
Phoenix, Ariz.: Sometime in July and October.
Pittsburgh: Sometime in August and November.
Portland, Maine: October 12.
Portland, Ore., 307 Fitzpatrick Bldg.: Friday, 8:30 A.M. for 20 and 13 w.p.m. tests.
Roanoke, Va.: October 2.
St. Louis, Mo.: Sometime in August and November.
St. Paul, Minn., 208 Federal Courts Bldg.: Friday.
Salt Lake City, Utah: September 17, December 17.
San Antonio, Texas: August 12, November 4.
San Diego, 15-C U. S. Customhouse: By appointment.
San Francisco, 323-A Customhouse: Friday.
San Juan, P. R., 323 Federal Bldg.: Thursday, and Monday through Friday at 8 A.M. if no code test required.
Savannah, Ga., 214 P. O. Bldg.: By appointment.
Schenectady, N. Y.: September 15–16, December 1–2, 9 A.M. and 1 P.M.
Seattle, Wash., 802 Federal Office Bldg.: Friday.
Sioux Falls, S. D.: Sept. 8 and December 8, 10 A.M.
Spokane, Wash.: Sometime in September.
Syracuse, N. Y.: Sometime in July and October.
Tallahassee, Fla.: July 24.
Tampa, Fla., 410 P. O. Bldg.: By appointment.
Tulsa, Okla.: July 19–20, October 25–26.
Tucson, Ariz.: Sometime in October.
Wailuku, T. H.: October 8.
Washington, D. C., 415 22nd St., N. W.: Monday through Friday, 8:30 A.M. to 5 P.M.
Wichita, Kansas: Sometime in September.
Williamsport, Penna.: Sometime in September and December.
Wilmington, N. C.: December 4.
Winston-Salem, N. C.: August 7, November 6.

CANADIAN REGS CHANGES

Several changes in Canadian regulations, effective on the annual April 1st anniversary date of licenses, are as follows:

1) Television emission is authorized in amateur bands above 420 Mc.

2) Radioteletype is authorized in the Canadian non-voice portions of the same bands as in U. S. A.

3) Mobile operation is permitted on private yachts.

4) Mobile is permitted in any privately-owned vehicle (previously limited to private passenger cars).

LICENSE FEES DEFERRED

As the date for filing comment on FCC's license fee proposal was drawing near, the Senate Interstate & Foreign Commerce Committee raised some basic questions of jurisdictional aspects of Congress *vs.* Government agencies in the general matter of requiring fees for certain federal services to individuals and groups, and as a result the Commission has postponed indefinitely any action on its fee proposals. For the time being, then, the amateur fee idea lies on the shelf.

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MINUTES OF 1954 SPECIAL MEETING OF THE BOARD OF DIRECTORS
AMERICAN RADIO RELAY LEAGUE
May 14–15, 1954

1) Pursuant to due notice, the Board of Directors of The American Radio Relay League, Inc., met in special session at the Brown Palace Hotel, Denver, Colorado, on May 14, 1954. The meeting was called to order at 9:31 A.M., MST, with President Goodwin L. Dosland in the Chair and the following directors present:

P. Lanier Anderson, Jr., Roanoke Division
James P. Born, Jr., Southeastern Division
John H. Brabb, Great Lakes Division
George V. Cooke, Jr., Hudson Division
Ray H. Cornell, Pacific Division
Gilbert L. Crossley, Atlantic Division
Alfred M. Gowan, Dakota Division
John R. Griggs, Southwestern Division
Claude M. Maer, Jr., Rocky Mountain Division
Wesley E. Marriner, Central Division
A. David Middelton, West Gulf Division
Percy C. Noble, New England Division
Alex Reid, Canadian Division
R. Rex Roberts, Northwestern Division
William J. Schmidt, Midwest Division
George H. Steed, Delta Division

Also in attendance as members of the Board, without vote, were Wayland M. Groves, First Vice President; F. E. Handy, Vice President; A. L. Budlong, General Manager. Also in attendance, at the invitation of the Board as non-participating observers, were Pacific Division Vice-Director Harry M. Engwicht, Southwestern Division Vice-Director Walter R. Joos and Midwest Division Vice-Director James E. McKim. There were also present Treasurer David H. Houghton, Technical Director George Grammer, Assistant Secretary John Huntoon, General Counsel Paul N. Segal and Quayle B. Smith of his office.

2) Rising to a point of order, Mr. Middelton moved that Mr. Crossley and Mr. Gowan not be seated at this special 1954 Board meeting if it is possible that any action taken by this Board could be negated if the Rock Creek v. ARRL case (now pending in Superior Court, State of Connecticut) is decided in favor of the plaintiffs. But, after consultation with the General Counsel, the Chair ruled that the motion was out of order.

3) On motion of Mr. Schmidt, unanimously VOTED, that the minutes of the 1953 special meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

4) On motion of Mr. Roberts, unanimously VOTED that the minutes of the 1954 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

5) On motion of Mr. Gowan, unanimously VOTED that the annual reports of the officers to the Board of Directors are accepted and the same placed on file.

6) Without objection, ORDERED that the reports of the Finance, Planning and Membership & Publications Committees go over for consideration later in the meeting under Item 11 of the agenda. Mr. Dosland presented the report of the Public Relations Committee; whereupon, without objection, the same was ORDERED placed on file, for consideration later in the meeting. Mr. Middelton reported briefly for the Merit Award Committee; whereupon, without objection, ORDERED that the same be received and placed

on file for consideration later in the meeting. Mr. Griggs read the minutes of an additional meeting of the Membership & Publications Committee held at the Brown Palace Hotel on Thursday, May 13, 1954, whereupon, without objection, ORDERED that the same be added to the earlier report of the Committee submitted by Mr. Griggs, for consideration later in the meeting.

7) On motion of Mr. Born, unanimously VOTED that the annual reports of the Directors to the Board of Directors are accepted and the same placed on file.

8) At this point, supplementary oral reports were rendered by the officers of the League.

9) Moved, by Mr. Crossley, the adoption of the following resolution: That, because of changes in amateur frequency allocation during the last two years and because of changed operating practices, it is the present view of the Board that the Secretary shall oppose, by appropriate representation to the FCC, the expansion of the 10-meter telephone band as proposed in Rule Making Docket 10927. But, after extended discussion, on motion of Mr. Maer, unanimously VOTED that this motion shall be taken up later when the Board goes into a Committee of the Whole for consideration of all amateur frequency sub-allocation matters.

10) Moved, by Mr. Crossley, that the Directors instruct the Secretary in the name of ARRL, to continue to seek a change in the Rules Governing Amateur Service, Part 12, Section 12.111(5)(k) as it pertains to 420–450 Mc. operation, so that the power limit be removed. Moved, by Mr. Schmidt, to amend the motion by striking the text and substituting therefor the following: That the Board instruct the General Manager to maintain constant pressure on this matter and submit to FCC the change in power limit when IRAC moves the frequency for altimeters; but, after discussion, Mr. Schmidt, with the permission of his second, withdrew the amendment. Whereupon, the question being on the original motion, following a roll-call vote, the same was ADOPTED; every director voted in the affirmative except Messrs. Maer and Reid, who abstained.

11) The Board was in recess from 10:55 A.M. until 11:07 A.M.

12) At this point the Board discussed informally the problem of adequate handling and form of FCC license materials and renewal procedures, during which the Secretary volunteered to discuss these matters with FCC personnel on the occasion of his next visit to Washington.

13) Moved, by Mr. Crossley, that the Directors in meeting do hereby change Article 7 of the Articles of Association by deleting the words "and one member of the Board of Directors designated by the Board". But, after consultation with the General Counsel, RULED by the Chair that the motion is out of order because of lack of adequate notice under Connecticut Statutes, inasmuch as it was not contained in the Notice for the meeting.

14) On motion of Mr. Marriner, following a roll call, unanimously VOTED that twice each year a list of club councils be printed in *QST*, together with the addresses of the councils.

15) Moved, by Mr. Marriner, that the ARRL Board assign to the proper committee for study, privileges for the Extra Class license. On motion of Mr. Roberts, VOTED to amend the motion by striking the text and substituting therefor the following: That the Planning Committee is instructed to make a study of the possibility of an incentive program being again instituted in the entire amateur license structure. The question then being on the motion as amended, the same was unanimously ADOPTED.

16) At this point, the Board discussed ARRL election procedures as described in By-Law 15 and received from the President and Secretary a detailed description thereof.

17) On motion of Mr. Brabb, following a roll call, unanimously VOTED that the General Manager investigate and take such action as is necessary to restore the 160-meter band to its pre-war status.

18) The Board was in recess for lunch from 12:25 P.M. until 2:11 P.M.

19) Moved, by Mr. Brabb, that the Board appropriate the sum of $10,000 for the purpose of enabling staff personnel and elected officers to attend amateur radio meetings upon the certification of the director that such meetings have had attendance of over 500 licensees in the past two years, provided, however, that such meetings provide an ARRL booth for the purpose of soliciting new members. After extended discussion, on motion of Mr. Maer, VOTED that the motion be amended by striking the text and substituting therefor the following: That the Board is cognizant of the salutary effects that the presence of Headquarters personnel has had in the past and will have in the future toward the enhancement of the ARRL, and urges the continued participation by Headquarters personnel at these events to the extent that personnel and funds are available. The question then being on the motion as amended, the same was ADOPTED.

20) Moved, by Mr. Brabb, that the League forward without cost 150 message-delivery cards to such radio amateurs who make BPL, and who shall be members of the League, provided, however, that no such award shall be given to any radio amateur more than once each year. After discussion, on motion of Mr. Noble, VOTED that the motion be amended by striking the text and substituting therefor the following: That an appropriate medallion shall be issued by the League to any amateur who achieves membership in the BPL the third time. Whereupon, the question being on the motion as amended, following a roll call, the same was ADOPTED, 14 votes in favor to 2 opposed; Mr. Cornell requested that he be recorded as voting against the motion.

21) On motion of Mr. Cooke, the following resolution was unanimously ADOPTED:

> WHEREAS, the Board of Directors, meeting at Denver, Colorado, on May 14, 1954, being sincerely appreciative of the prolific contributions to the radio art and particularly to the foundation and scientific advancement of amateur radio made by Major Edwin H. Armstrong during his lifetime, and
>
> WHEREAS, the Board of Directors of the American Radio Relay League is deeply grieved by the recent passing of Major Armstrong,
>
> NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the League, in the name of amateur radio, hereby expresses its sincere sympathy to Major Armstrong's family, and directs that the President of the League write Major Armstrong's family, expressing the sentiments of the League and transmitting a copy of this Resolution.

22) On motion of Mr. Cooke, unanimously VOTED that the Secretary be instructed to have Form CD-18 Annual Club Survey Questionnaire filed with the League in duplicate by affiliated clubs; original copies to be retained by the Communications Manager, duplicate copies forwarded to the various directors where jurisdictionally responsible.

23) Moved, by Mr. Cooke, that the General Manager be requested to study the language of the Renewal Classification Card Form 2M-10-51 with the view of simplifying the last paragraph in order to save effort and postage whereby unnecessary returns are made; but there was no second, so the motion was lost.

24) On motion of Mr. Cooke, unanimously VOTED that the Planning Committee be instructed to make a thorough study of the growth and unbalance of membership within the various divisions, specifically to recommend to the Board, as soon as practicable, possible adjustments to arrive at a near balance of membership with other divisions in the Hudson, Atlantic, Dakota and Rocky Mountain Divisions.

25) Moved, by Mr. Noble, to amend Article 8 by deleting all but the first sentence and replacing the stricken text with the following: "Upon the occurrence of such vacancy, the Secretary shall proclaim it and thereafter the duties of the Director shall be assumed by the Vice-Director, who shall then be called Director. He shall hold this office for the remainder of the term for which he was elected Vice-Director. As soon as practicable after a Vice-Director has become a Director, an election for the purpose of electing a new Vice-Director shall be held in the division concerned. Should the office of both Director and Vice-Director be vacant, the vacancy shall be filled by the appointment of a Director by the President." On a point of order, the Chair, after consultation with the General Counsel, ruled that the motion was in order. Moved, by Mr. Cooke, that the motion be amended by inserting between the words "division" and "concerned" the following: "wherein the vacancy occurred, provided that the remainder of the term from date of taking office as Director be over a full six-months period prior to the next regular date of election in the division." On motion of Mr. Maer, unanimously VOTED that the matter is laid on the table.

26) During the course of the above, the Board was in recess from 3:41 P.M. to 4:09 P.M.

27) On motion of Mr. Cornell, unanimously VOTED that the Planning Committee is directed to investigate and report to the Board as soon as possible the possibility of petitioning the FCC that pulse modulation be permitted on 1215 Mc.

28) Moved, by Mr. Cornell, that the Pacific Division wishes to have the ARRL Board (as well as League personnel) support the principle of maintaining pressure on the FCC to make regulations leading to a control of ITV on amateur frequencies, but, after discussion, with the permission of his second, Mr. Cornell withdrew the motion.

29) Moved, by Mr. Cornell, that the Secretary be instructed to support the proposed FCC Docket 9288, which provides for the regulation of all electromagnetic radiating devices. On motion of Mr. Maer, unanimously VOTED to amend the motion to say that the League supports the Docket insofar as it attempts to alleviate interference from television receivers to the amateur service. The question then being on the motion as amended, the same was unanimously ADOPTED.

30) Moved, by Mr. Cornell, that the General Manager be instructed to oppose to the maximum possible extent the proposed "McCarthy" bill which provides for the recording of all radio transmissions. But, after discussion, during which it was brought out that the bill, as written, does not provide for such recordings by amateurs, Mr. Cornell, with the permission of his second, withdrew the motion.

31) On motion of Mr. Cornell, RESOLVED that this Board goes on record as heartily supporting the Executive Committee's position on Docket 10869 concerning proposed license fees; Mr. Middelton asked to be recorded as opposing the resolution.

32) Moved, by Mr. Cornell, that future Board meetings be held at League Headquarters at Hartford, Connecticut. But, after discussion, during which it was brought out that the By-Laws provide for meetings in West Hartford unless otherwise ordered, Mr. Cornell, with the permission of his second, withdrew the motion.

33) On motion of Mr. Born, unanimously VOTED that the General Manager be instructed to send a letter to all affiliated clubs, at the same time as the request is made for annual information, offering, at League expense, a copy of the Annual Reports of the Officers and Directors of the ARRL.

34) On motion of Mr. Griggs, unanimously VOTED that the Board does herewith instruct the Planning Committee to study the feasibility of petitioning the Federal Communications Commission for the opening of all bands for high-seas maritime mobile operation on a world-wide basis, excepting the 21-Mc. and 28-Mc. bands already allocated, but restricted within those bands of frequencies known to be the minimum permitted amateurs in any part of the world.

35) Moved, by Mr. Griggs, that the Board does hereby instruct the General Manager to have prepared in booklet or pamphlet form representative types of restrictive zoning or planning ordinances, or those sections thereof that are of particular interest to radio amateurs in that they may inhibit the amateur's right to operate and employ antenna systems or other appurtenances and to include in such booklet a compilation of methods found successful by the League membership in overcoming such ordinances, and to include a legal case reference list for the guidance of counsel employed by any amateur, said booklet to be made available at cost to League members and radio amateurs generally. On motion of Mr. Maer, VOTED, to amend the motion by striking out the text and substituting therefor the following: "That the Board commends the excellent work done by its General Counsel, officers and staff in the field of restrictive zoning ordinances affecting amateur radio installations, and urges continuation of this work, particularly in the field of assistance to local counsel." Messrs. Griggs and Middelton asked to be recorded as voting against the amendment. The question then being on the motion as amended, the same was unanimously ADOPTED.

36) Moved, by Mr. Griggs, that the Board does hereby instruct President Dosland to attend, if possible, the LMRE Convention at Acapulco, Mexico, May 27–30, 1954, as an official ARRL representative. But, after discussion, the motion was lost; Messrs. Griggs and Middelton asked to be recorded as voting in favor of the motion.

37) Moved, by Mr. Middelton, that in order to prevent misunderstandings and errors in the preparation of permanent minutes, that proceedings of all meetings of the ARRL Board of Directors and the ARRL Executive Committee be recorded by manual, mechanical or electronic methods, and that a complete verbatim transcript of both of these proceedings be made available to any director upon request. Moved, by Mr. Brabb, to amend the motion to provide that such transcript be made available to any director provided he pay for said transcript out of his division funds; but the motion to amend was lost, 6 votes in favor to 9 opposed. The question then being on the original motion, and the yeas and nays being ordered upon request, the same was

The ARRL Board of Directors and League officials at a luncheon recess during the meeting in Denver on May 14th. *Seated, l. to r.:* Technical Director Grammer; Midwest Director Schmidt; New England Director (and newly-elected Vice-President) Noble; Treasurer Houghton; (*foreground*) Pacific Director Cornell; President Dosland; First Vice-President Groves; (*foreground*) Pacific Vice-Director Engwicht; Northwestern Director Roberts; General Manager Budlong; Dakota Director Gowan; Vice-President and Communications Manager Handy. *Standing, l. to r.:* Southwestern Vice-Director Joos; Canadian Director Reid; Southwestern Director Griggs; West Gulf Director Middelton; Delta Director Steed; Midwest Vice-Director McKim; Southeastern Director Born; Roanoke Director Anderson; Atlantic Director Crossley; Rocky Mountain Director Maer; Quayle B. Smith of the General Counsel's office; Great Lakes Director Brabb; Hudson Director Cooke; Central Director Marriner; Asst. Secretary Huntoon.

decided in the negative: Full number of votes cast, 16; necessary for adoption, 9; yeas, 5; nays, 11. All the directors voted in the negative except Messrs. Born, Brabb, Griggs, Middelton and Steed, who voted in favor. So the motion was rejected.

38) Moved, by Mr. Middelton, that the Board of Directors order and direct that all minutes made of any meeting

PERCY C. NOBLE, W1BVR
New Vice-President

of the Executive Committee contain a roll call vote on any subject voted upon, except in those cases where a unanimous vote is cast and there are no absentees. On a point of order raised by Mr. Noble, RULED by the Chair, after consultation with the General Counsel, that the motion is out of order inasmuch as it would require an amendment of Article 7 of the Articles of Association and required notice had not been given. On an appeal of the ruling of the Chair by Mr. Brabb, the Chair was upheld; Messrs. Griggs and Middelton asked to be recorded as voting against the ruling of the Chair.

39) Moved, by Mr. Middelton, that it is the sense of this Board that the services of a paid, full-time administrative assistant be made available to the President of ARRL. Such administrative assistant to be located and given such tasks and assignments deemed desirable and required by the President. But, after discussion, during which the President explained he had no need for such an assistant, the motion was lost; Mr. Middelton asked to be recorded as voting in favor of the motion.

40) Moved, by Mr. Middelton, that the Board of Directors does hereby authorize the establishment of a permanent sub-allocation committee, to work jointly and with the concurrence of the Federal Communications Commission, to conduct a continuing study of the relative density of occupancy exhibited in each sub-allocated portion of the U. S. amateur frequency bands, and to make recommendations to the FCC periodically at intervals of two years, leading to the revision of amateur sub-allocations in accordance with the ARRL sub-allocation committee findings. But, after discussion, the motion was lost; Messrs. Brabb, Griggs and Middelton asked to be recorded as voting in favor of the motion.

41) Moved, by Mr. Middelton, that a survey (at two-year intervals beginning at the first possible date) be conducted by means of an unstamped postcard inserted in *QST* circulated within the United States, its territories and possessions, carrying the following form: "My preference in operating my amateur station in the following bands, and by the methods specified as in accordance with the percentage I have listed (provision for indication of phone, c.w. or RTTY preference by band) . . .". All percentages listed should total 100%. Provision shall be made to signify: (a) ARRL membership; (b) a valid amateur license. This preference of use and occupancy survey to be utilized in determining ARRL's policy and recommendations to FCC regarding sub-allocations of the amateur bands. After discussion, the yeas and nays being ordered, upon request, the question was decided in the negative. Total number of votes cast, 15. Necessary for adoption, 8; yeas, 3; nays, 12. All the directors voted in the negative except Messrs. Brabb, Griggs and Middelton, who voted in favor, and Mr. Reid, who abstained. So the motion was rejected.

42) The Board was in recess for dinner from 6:22 P.M. until 8:48 P.M. Mr. Griggs failing to answer the roll call, the Chair, on a point of order raised by Mr. Brabb, RULED, after consultation with the General Counsel, that Vice-Director Joos could not sit at the meeting for Mr. Griggs under provisions of Article 8 of the Articles of Association.

43) Moved, by Mr. Middelton, that the Executive Committee is requested to submit for determination of decision by the members of the Board of Directors by mail vote any proposal pending before the Executive Committee when such proposal and a request for a mail vote has been made in writing to the Committee by an officer or director. After discussion, the yeas and nays being ordered, upon request, the question was decided in the negative. Total number of votes cast, 15; necessary for adoption, 8; yeas, 3; nays, 12. All the directors voted in the negative except Messrs. Born, Middelton and Noble, who voted in favor. So the motion was rejected.

44) Moved, by Mr. Middelton, that under the Rules and Regulations Concerning ARRL Conventions, paragraph 4, it is proposed that the following words be added: "The management, program and financial plans of every such National Convention shall be subject to the final approval of the director of the division in which the National Convention is to be held." Moved, by Mr. Noble that the motion be amended to strike the text and substitute therefor the following: "The management, program and financial plans of every such National Convention, after approval by the Board, shall be supervised by the director of the division in which the National Convention is to be held." After discussion, the yeas and nays being ordered, upon request, the amendment was decided in the affirmative. Total number of votes cast, 15; necessary for adoption, 8; yeas, 11; nays, 4. All the directors voted in the affirmative except Messrs. Anderson, Cornell, Reid, and Schmidt, who voted in the negative. So the amendment was ADOPTED. The question being on the motion as amended, and the yeas and nays being ordered, upon request, the same was decided in the affirmative: Total number of votes cast, 15; necessary for adoption, 8; yeas, 10; nays, 5. All the directors voted in the affirmative except Messrs. Anderson, Crossley, Maer, Reid and Schmidt, who voted in the negative. So the motion was ADOPTED.

45) On motion of Mr. Brabb, at 9:21 P.M., the Board recessed under orders to reassemble at 9:00 A.M. on the morrow. The Board reassembled at the same place on May 15, 1954, and was called to order by the Chair at 9:01 A.M. with all directors and other persons hereinbefore mentioned in attendance.

46) Moved, by Mr. Middelton, that Mr. Gowan and Mr. Crossley not be seated at this special 1954 ARRL Board meeting, so that a legally constituted body made up in accordance with the Articles of Association and By-Laws can consider the business of the ARRL. RULED, by the Chair, that the motion was out of order. On an appeal by Mr. Middelton from the ruling of the Chair, the yeas and nays being ordered upon request, the ruling of the Chair was upheld: Total number of votes cast, 16; necessary for adoption, 9; yeas, 13; nays, 3. All of the directors voted in the affirmative except Messrs. Brabb, Griggs and Middelton, who voted in the negative. So the ruling of the Chair was upheld.

47) On motion of Mr. Roberts, unanimously VOTED that the General Manager is hereby authorized to reimburse the Division Directors for actual expenses incurred by them during the year 1954 in the proper administration of ARRL affairs in their respective divisions, up to amounts as follows:

Canadian Division Director	$ 400
Atlantic Division Director	1000
Central Division Director	850
Dakota Division Director	700
Delta Division Director	800
Great Lakes Division Director	800
Hudson Division Director	700
Midwest Division Director	900
New England Division Director	400
Northwestern Division Director	850
Pacific Division Director	1200
Roanoke Division Director	500
Rocky Mountain Division Director	800
Southeastern Division Director	1000
Southwestern Division Director	1100
West Gulf Division Director	1000

48) On motion of Mr. Schmidt, unanimously VOTED, that the General Manager is hereby authorized to pay expenses for the operation of ARRL committees during the year 1954, but not to exceed the amounts as follows:

Planning Committee	$2000
Finance Committee	1500
Membership & Publications Committee	1000
Public Relations Committee	1000
Merit Award Committee	250

49) Moved, by Mr. Gowan, that the General Manager is hereby authorized to reimburse, within the continental limits of the United States and Canada only, the Section Communications Managers and QSL Managers of the League, in a total amount not to exceed $5000 for the year 1954, under the provisions and conditions set up in paragraph (52) of the minutes of the 1953 Special Meeting of the Board of Directors. After discussion, moved by Mr. Crossley, that the motion be amended by adding thereto the following: "For the purpose of defraying such incidental costs as necessary meals or one night in a hotel if meeting is over 50 miles from an official's home, or highway tolls involved, for example, reimbursement in excess of mileage may be made in a reasonable amount to be approved by the Communications Manager per SCM organization meeting, provided that each miscellaneous expenditure to the total claimed must be itemized and submitted with the mileage claim." Moved, by Mr. Born, to further amend the motion by adding thereto the following: "The SCMs of Puerto Rico and the Canal Zone are authorized to travel on the mainland of Puerto Rico and the limits of the Canal Zone, and the SCMs of Hawaii and Alaska within their sections, all such travel limited to two ARRL Section organization meetings only, but no division meeting such as covered by section (3) of paragraph (52) of the minutes of the 1953 Special Meeting of the Board of Directors." Moved, by Mr. Schmidt, that Mr. Born's amendment be laid on the table; but the motion to table was lost. The question being on Mr. Born's amendment, following a roll-call vote, the amendment was lost, seven votes in favor to nine opposed. The question then being on Mr. Crossley's amendment, the same was unanimously ADOPTED. The question then being on the motion as amended, the same was unanimously ADOPTED.

50) On motion of Mr. Maer, unanimously VOTED, that the Communications Manager be directed to submit to the Executive Committee at the earliest convenient time, recommendations covering traveling expenses for SCMs and SECs outside the continental limits of the United States and Canada.

51) On motion of Mr. Crossley, unanimously VOTED, that to continue the Board's policy of reimbursing Section Emergency Coordinators for certain travel, the General Manager is hereby authorized to pay during the year 1954 a total amount not to exceed $3500 under the provisions and conditions specified in paragraph (58) of the minutes of the 1952 Special Meeting of the Board of Directors. For the purpose of defraying such incidental costs as necessary meals or one night in a hotel if meeting is over 50 miles from an official's home, or highway tolls involved, for example, reimbursement in excess of mileage may be made in a reasonable amount to be approved by the Communications Manager per SEC organization meeting, provided that each miscellaneous expenditure to the total claimed must be itemized and submitted with the mileage claim.

52) On motion of Mr. Born, unanimously VOTED, that the General Manager is hereby authorized to pay, during the period between January 1, 1955, and the 1955 meeting of the Board, expenses against usual authorizations for administrative and committee operations, in no greater amounts than 1954 authorized amounts.

53) At this point, Mr. Noble read the report of the Finance Committee, and on his motion the same was unanimously ADOPTED. After discussion, on motion of Mr. Middelton, VOTED that the Finance Committee study the present site of W1AW and other sites relative to the possibility or need of purchasing additional sites, and report to the Board of Directors.

54) At this point, Mr. Brabb read the report of the Planning Committee, and on his motion the same was unanimously ADOPTED.

55) At this point, Mr. Griggs made a brief supplementary report for the Membership & Publications Committee. On motion of Mr. Roberts, unanimously VOTED that League Headquarters is directed to write a 16-page booklet on the history of amateur radio and the formation and growth of the League, to be run in *QST* in installments, as the General Manager sees fit, then to be reprinted as a low-priced pamphlet.

56) The Board was in recess from 10:42 A.M. until 10:58 A.M.

57) Moved, by Mr. Roberts, that Paragraph 30 of the By-Laws of the American Radio Relay League be amended by striking the entire text thereof and substituting the following: "30. The following standing committees are established: Finance Committee, Planning Committee, Membership & Publications Committee," and that the following paragraph be inserted between Paragraphs 33 and 34 under the heading "Standing Committees": "The Membership & Publications Committee shall act as a reference body to which the Board may from time to time by resolution refer problems requiring special study and recommendations as to membership and publications problems." After discussion, the question being on the amendment of the By-Laws, and the yeas and nays being ordered, the question was decided in the negative: Whole number of votes cast, 16; necessary for adoption, 12; yeas, 11; nays, 5. All the directors voted in the affirmative, except Messrs. Anderson, Brabb, Cooke, Crossley and Reid, who voted in the negative. So the motion to amend the By-Laws was rejected.

58) On motion of Mr. Roberts, unanimously VOTED, that the Membership & Publications Committee be continued for an additional year.

59) On motion of Mr. Dosland, as Chairman of the Committee, unanimously VOTED to accept the report of the Public Relations Committee, and place the same on file, and to direct the Headquarters to comply with its recommendations.

60) Moved, by Mr. Middelton, that the ARRL's General Manager have prepared by competent agencies suitable and effective publicity such as news releases, radio and TV broadcast scripts, and films for showing to TV set users. After discussion, the yeas and nays being ordered, upon request, the motion was decided in the negative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 2; nays 14. All the directors voted in the negative except Messrs. Griggs and Middelton, who voted in favor. So the motion was rejected.

61) On motion of Mr. Cornell, it was unanimously RESOLVED that the General Manager and the Headquarters staff be commended for the excellent work performed in the field of TVI.

62) On motion of Mr. Cooke, unanimously VOTED that the Board commends the actions, coöperation, and results of radio TVI Committees and sincerely hopes that such effective programming will continue to the ultimate removal of the problem.

63) On motion of Mr. Griggs, unanimously RESOLVED that this Board does hereby commend Lewis McCoy, W1ICP, and the Technical Staff of ARRL, for the outstanding presentation of the ARRL TVI demonstration in various parts of the country.

64) Moved, by Mr. Maer, that the Board does now resolve itself into a Committee of the Whole, for the purpose of discussing FCC sub-allocation matters and possible amendments to Article 12 of the Articles of Association. On motion of Mr. Brabb, VOTED to amend the motion to

TVI COMMITTEE WORK PRAISED

Examining the position of the amateur in TVI matters, the ARRL Board of Directors concluded that a great deal of the credit for the remarkable progress which has been made in solution of interference problems belongs to the fine work of community groups serving as TVI Committees, and formally extended these groups the sincere appreciation of the League. At the same time the Board again expressed its thanks to the Field Engineering & Monitoring Bureau of FCC, sponsors of the committees, for continued assistance and coöperation.

BOARD THANKS VOLUNTEER A.R.R.L. OFFICIALS

In reviewing the work of the League for the past year the ARRL Board of Directors again found that much of our progress is due to the volunteer efforts of elected and appointed officials in the administrative and field organization of our association. By unanimous action the Board has again expressed its sincere thanks to the Vice-Directors, director assistants, SCMs, SECs and QSL Managers — an action which we know all amateurs will heartily endorse.

include consideration of past actions of the Executive Committee. The question being on the motion as *amended*, the same was ADOPTED, at 11:30 A.M.; Mr. Middelton requested to be recorded as being opposed as going into a Committee of the Whole. The Chair appointed himself Chairman of the Committee of the Whole, and Mr. Budlong its Secretary. The Board, sitting as a Committee of the Whole, was in recess for luncheon from 12:30 P.M. until 2:10 P.M. The Committee arose at 3:49 P.M.

65) The Board was in recess from 3:49 P.M. until 4:09 P.M.

66) Mr. Dosland, as Chairman of the Committee of the whole, laid before the Board the report of the Committee.

67) On motion of Mr. Crossley, VOTED that the General Manager is directed to withdraw the League's petition requesting the granting of a mobile telephone sub-band from 3775 to 3800 kc.; Messrs. Middelton and Steed asked to be recorded as voting in the negative.

68) On motion of Mr. Crossley, unanimously VOTED that the Board approves in principle the comments of the FCC on sub-allocations to special interests as published in Docket 10927.

69) On motion of Mr. Noble, unanimously VOTED that the General Manager is directed to request of FCC that it revive study of the League's earlier proposal to grant Novice operating privileges on the frequencies 7150–7200 kc.

70) On motion of Mr. Roberts, the following resolution was ADOPTED; Messrs. Griggs and Middelton asked to be recorded as voting in the negative:

> WHEREAS, there have been several motions offered for the amendment of Article 12 of the Articles of Association, dealing with eligibility for office, and
>
> WHEREAS, the Board has discussed the rulings of the Executive Committee as to the eligibility of candidates for director in each the Atlantic, Dakota and Midwest Divisions, as those rulings are expressed in the minutes of its Meeting No. 227 of September 28, 1953,
>
> BE IT RESOLVED: That the Board expresses and records its approval of those rulings as so expressed.

71) On motion of Mr. Griggs, unanimously VOTED that the Board does hereby instruct the Executive Committee to prepare at its next meeting an amendment to Article 8, providing for the temporary seatings of any vice-director at a Board meeting for the purpose of acting in lieu of his director upon the illness or other temporary incapacity of the latter, said amendment to be submitted to Mr. Griggs or his successor for possible presentation at the next regular meeting of the Board.

72) Moved, by Mr. Noble, to amend Article 8 of the Articles of Association to strike the last sentence thereof and substitute the following: "At the next election of Directors and Vice-Directors prescribed in the By-Laws, a Vice-Director shall be elected to fill such vacancy by mail vote in accordance with rules and regulations prescribed by the Board of Directors in the By-Laws, to serve for the remainder of the term of the Vice-Director. Should the office of both Director and Vice-Director be vacant, the office of Director shall be filled by appointment by the President." After discussion, the yeas and nays being ordered as required, the motion was decided in the negative: Whole number of votes cast, 16; necessary for adoption, 12; yeas, 6; nays, 10. Those voting in the affirmative were Messrs. Cornell, Griggs, Maer, Middelton, Noble, and Reid. Those voting in the negative were Messrs. Anderson, Born, Brabb, Cooke, Crossley, Gowan, Marriner, Roberts, Schmidt, and Steed. So the motion to amend was rejected.

73) Moved, by Mr. Cornell, to amend Article 12 of the Articles of Association, by adding the words "in a policy-forming position" after the word "engaged" in line 10. Moved, by Mr. Roberts, that the matter be tabled. The question being on the motion to table, and the yeas and nays being ordered, upon request, the same was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 13; nays, 3. All the directors voted in the affirmative except Messrs. Cornell, Griggs, and Middelton, who voted in the negative. So the motion was tabled.

74) On motion of Mr. Crossley, unanimously VOTED that, pursuant to the terms of the Trust Agreement under the Pension Plan, the following persons are appointed to serve as the Pension Committee from June 2, 1954, to June 2, 1955: Arthur L. Budlong, George Grammer, and David H. Houghton.

75) Moved, by Mr. Noble, the adoption of the following resolution:

> BE IT RESOLVED that, pursuant to Article 7 of the Articles of Association, R. Rex Roberts is hereby designated and appointed a member of the Executive Committee, to serve as such for the period ending May 15, 1955, and
>
> BE IT RESOLVED that, pursuant to Article 7 of the Articles of Association, F. E. Handy is hereby designated and appointed a member of the Executive Committee, to serve as such for the period ending May 15, 1955, and
>
> BE IT RESOLVED that, pursuant to Article 7 of the Articles of Association, David H. Houghton is hereby designated and appointed a member of the Executive Committee, to serve as such for the period ending May 15, 1955.

After discussion, on the request of Mr. Brabb, the Chair ordered a division of the question. Thereupon, without objection, on the request of Mr. Maer, the Chair ordered that voting on Mr. Roberts to be a member of the Executive Committee be conducted by secret ballot, and appointed Messr. Noble and Schmidt as tellers. The ballots having been counted, the tellers announced the results as 9 in favor to 7 opposed. Mr. Roberts was therefore declared elected as a member of the Executive Committee to serve as such for the period ending May 15, 1955.

76) In respect to the second section of the resolution, upon motion of Mr. Maer, VOTED, 11 votes in favor to 5 opposed, that the meeting is now open for the receipt of nominations to membership on the Executive Committee under Article 7 of the Articles of Association. Mr. Griggs nominated Mr. Brabb; Mr. Noble nominated Mr. Handy; Mr. Cornell nominated Mr. Maer. Upon motion of Mr. Roberts, unanimously VOTED that the nominations are closed. The secret ballot having been taken, the results were announced as follows: Mr. Handy, 8; Mr. Maer, 4; Mr. Brabb, 4; whereupon Mr. Handy was declared elected as a member of the Executive Committee to serve as such for the period ending May 15, 1955.

77) In respect of the third paragraph of the resolution, upon motion of Mr. Maer, VOTED that the meeting is now open for receipt of nominations to the Executive Committee under Article 7 of the Articles of Association. Mr. Noble nominated Mr. Houghton; Mr. Middelton nominated Mr. Brabb; Mr. Reid nominated Mr. Maer. On motion of Mr. Anderson, unanimously VOTED, that the nominations are closed. The secret ballot having been taken, the results were announced as follows: Mr. Houghton, 8; Mr. Brabb, 4; Mr. Maer, 4. So Mr. Houghton was declared elected as a member of the Executive Committee to serve as such for the period ending May 15, 1955.

78) At this point, the President announced the following committee appointments for the following year:

Finance Committee
Mr. Noble, Chairman
Mr. Anderson
Mr. Roberts

Planning Committee
Mr. Brabb, Chairman
Mr. Crossley
Mr. Gowan

Membership & Publications Committee
Mr. Griggs, Chairman
Mr. Marriner
Mr. Cooke

Public Relations Committee
Mr. Dosland, Chairman
Mr. Maer
Mr. Born

Merit Award Committee
Mr. Middelton, Chairman
Mr. Reid
Mr. Budlong

79) On motion of Mr. Reid, unanimously VOTED that the Canadian membership certificates be adorned with a maple leaf in the center and the words "Canadian Division."

80) On motion of Mr. Noble, the following resolution was unanimously ADOPTED:

> WHEREAS, on January 28, 1954, Alice V. Scanlan completed 25 years of continuous service to the American Radio Relay League as Chief Accountant, and as Assistant Treasurer,
>
> BE IT RESOLVED, that the Board of Directors, meeting in Denver, Colorado, on May 15, 1954, in recognition of Alice V. Scanlan's untiring efforts on behalf of the League, does hereby express its deep appreciation of her loyalty, fidelity, and intelligent devotion to the best interests of amateur radio.

81) On motion of Mr. Noble, unanimously VOTED that the Board now reconsider its earlier action amending the rule concerning national conventions. Moved, by Mr. Noble, that Rule 4 of the Rules and Regulations Concerning American Radio Relay League Conventions be amended by adding after the text the following: "The management, program, and financial plans of every such convention shall be subject to the approval of the director of the division in which the convention is to be held." After discussion, and the yeas and nays being ordered, upon request, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 13; nays, 3. All the directors voted in the affirmative, except Messrs. Maer, Reid, and Schmidt, who voted in the negative. So the rule was amended.

82) On motion of Mr. Maer, unanimously VOTED that a special committee be appointed to make a study of the problems of the physically handicapped in obtaining amateur radio licenses, and to make recommendations to the Board for the solution of such problems.

83) On motion of Mr. Maer, unanimously VOTED that the ARRL take all action necessary to have a commemorative stamp issued by the U. S. Postoffice Department in recognition of the service of amateur radio on the occasion of the 40th anniversary of the incorporation of ARRL, January 29, 1955.

84) On motion of Mr. Brabb, unanimously VOTED that the Board hereby expresses its sincere thanks and deep appreciation for the untiring work and devotion of the Vice-Directors, director assistants, SCMs, SECs, and QSL Managers of the League.

85) On motion of Mr. Brabb, unanimously VOTED that the Board go on record as commending the Field Engineering and Monitoring Bureau of the Federal Communications Commission for its assistance and coöperation rendered amateurs over the past year.

86) On motion of Mr. Cornell, unanimously VOTED that it is the sense of this Board that the National Traffic System receive equal emphasis with other activities of the Communications Department which receive full-time consideration, and that the General Manager be requested to make such administrative changes as may be possible to implement this request.

87) On motion of Mr. Cornell, unanimously VOTED that the Board does hereby request the Membership & Publications Committee to study the possible methods by which League membership might be increased.

88) On motion of Mr. Cornell, unanimously VOTED that the Board does hereby refer to the Membership & Publications Committee a study of existing League publications for the purpose of determining their relative effectiveness in meeting the varying demands of radio amateurs generally.

89) On motion of Mr. Schmidt, affiliation was unanimously GRANTED the Lebanon Amateur Radio Klub, Lebanon, Missouri.

90) On motion of Mr. Brabb, unanimously VOTED that the Board does express its appreciation to President Dosland for arranging the visit of FCC Commissioners and personnel to Headquarters earlier this year.

91) At this point, the Chair announced his appointments to the Committee for the Handicapped: Mr. Maer, Chairman, Mr. Steed, Mr. Schmidt, and Mr. Segal.

92) On motion of Mr. Maer, unanimously VOTED that the General Manager is hereby authorized to pay expenses for the operation of the Committee for the Handicapped during the year 1954, but not to exceed $400.

93) The Board was in recess from 6:05 P.M. until 6:09 P.M.

94) The next order of business being the election of officers, the Chairman announced the opening of nominations for President. Mr. Brabb nominated Mr. Dosland. Mr. Middelton nominated Mr. Griggs; but Mr. Griggs withdrew his name. On motion of Mr. Noble, unanimously VOTED that the nominations are closed. Whereupon, on motion of Mr. Roberts, unanimously VOTED that the Secretary cast one ballot for Mr. Dosland. The Chair thereupon declared Mr. Dosland elected as President.

95) The Chair announced the opening of nominations for First Vice-President. Mr. Roberts nominated Mr. Groves; Mr. Brabb nominated Mr. Noble; but Mr. Noble withdrew his name. Mr. Middelton nominated Mr. Griggs. On motion of Mr. Noble, unanimously VOTED that the nominations be closed. The Chair appointed Messrs. Schmidt and Noble as tellers. The tellers announced the result of the first ballot as follows: Mr. Groves, 12; Mr. Griggs, 4. The Chair thereupon declared Mr. Groves elected as First Vice-President.

96) The Chair announced the opening of nominations for an additional Vice-President. Mr. Born nominated Mr. Handy. On motion of Mr. Roberts, unanimously VOTED that the nominations are closed. Further on motion of Mr. Roberts, unanimously VOTED that the Secretary cast one ballot for Mr. Handy. The Chair thereupon declared Mr. Handy elected as Vice-President.

97) The Chair announced the opening of nominations for an additional Vice-President. Mr. Maer nominated Mr. Noble. On motion of Mr. Cornell, unanimously VOTED that the nominations are closed. On motion of Mr. Maer, unanimously VOTED that the Secretary cast one ballot for Mr. Noble. The Chair thereupon declared Mr. Noble elected as Vice-President.

98) The Chair announced the opening of nominations for Secretary. Mr. Crossley nominated Mr. Budlong. On motion of Mr. Roberts, unanimously VOTED that the nominations are closed. On motion of Mr. Schmidt, unanimously VOTED that the Secretary cast one ballot for Mr. Budlong. The Chair thereupon declared Mr. Budlong elected as Secretary.

99) The Chair announced the opening of nominations for Treasurer. Mr. Middelton nominated Mr. Houghton. On motion of Mr. Griggs, unanimously VOTED that the nominations are closed. On motion of Mr. Roberts, unanimously VOTED that the Secretary be directed to cast one ballot for Mr. Houghton. The Chair thereupon declared Mr. Houghton elected as Treasurer.

100) Whereupon, on motion of Mr. Cooke, the Board adjourned, *sine die*, at 6:26 P.M.

101) (Time in session as a Board, 11 hours, 24 minutes; as a Committee of the Whole, 2 hours, 39 minutes; total time, 14 hours, 3 minutes. Total authorizations $27,650.)

A. L. BUDLONG
Secretary

ARE YOU LICENSED?

• When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

Progress and Activities Report—Washington TVI Committee

BY HAROLD R. RICHMAN,* W4CIZ

THE committee approach to the amateur interference problem has served the amateur well. Literally, it has helped to smooth those ominous waves of troubled waters that a few short years ago threatened to engulf the amateur and TV viewer in a breach of ill feeling.

The effect of the work of these committees, in the aggregate, is becoming evident to the individual amateur. The amateur who has had the advantages of the services of a local committee now operates more freely. He no longer invites the widespread animosity of his neighbors.

The Washington TVI Committee is one such group of several hundred active committees. Each has contributed its share toward the very fine reputation the program has achieved in a relatively short interval of time.

Operational Progress

Since its initial organizational and functional report in the December 1952 issue of *QST*, the committee has continued to hold regularly scheduled meetings. It has established efficient procedures covering the handling of interference cases referred to the group from any source. The committee has urged greater participation in committee work by more amateurs, particularly those associated with clubs serving the committee. Each club now maintains an up-to-date working committee with alternates readily available. Cases referred by the committee coördinator to member clubs are being processed as expeditiously and thoroughly as can be expected from a voluntary group of individuals. As a result of a conspicuously fair-minded approach its findings are respected by amateur, set owner and set manufacturer's representative alike.

The committee continues to maintain close liaison with its associates which include representatives of the RETMA, NAB, Electric Institute of Washington, local TV manufacturers service agencies, Telecasting Services, FCC, Military Amateur Radio, and power companies.

The pioneering work of the committee in the informal investigation of amateur stations involved in TVI cases, and the fine job of the amateurs who have placed their own equipment in order, has made it possible for the committee to compile a list of local amateur stations found by its members to be TVI-proofed. In general, the committee policy requires for this classification interference free operation of two near-by television receivers, plus any television receivers in the home of the amateur. If no further complaints are received from owners of receivers already provided with filters it can be assumed that the amateur station remains free of objectional harmonics and spurious radiation. It is therefore usually unnecessary for the committee to make a full investigation of subsequent complaints lodged against these amateurs unless such complaint is received from the owner of a receiver already provided with a filter. As the list of TVI-proofed amateur stations increases, the workload of the committee actually becomes correspondingly smaller.

In publicizing itself to amateurs, the committee recently printed and distributed 2000 copies of a 5-page letter introducing Washington area amateurs to the TVI group set up for their use and benefit. The necessary funds for operating the committee are obtained by donations, auctions, and from the sale of mimeographed copies of local amateur stations listed geographically.

Its success on the home front has enabled the committee to direct its fullest efforts toward meeting the service technician more than halfway. The WTVIC has employed three "keys" in this endeavor: (1) building up and maintaining a feeling of sympathetic, mutual understanding between amateur and TV service technician in meeting a common problem in the public interest, (2) providing the means for keeping the serviceman well-informed on the subject of TVI in general, (3) making available to the serviceman information concerning the best practical means for detecting and correcting interference to TV receivers resulting from the operation of an amateur radio station.

Coöperation of the Manufacturers

Leading to this practical approach with the serviceman was the participation and coöperation effected by the TV set manufacturers in the master committee plan. This good will on the part of the manufacturer is a necessary requisite to expedite handling of amateur TVI cases, on a harmonious level, where committee investigation has shown a receiver susceptibility to interference to exist. The committee alone can provide only diagnostic services in its investigation of receiver problems. Without the mutual assistance program of the manufacturers it is quite evident that the sincerest efforts of the WTVIC could offer no solution satisfactory to the receiver owner for providing an acceptable solution for amateur TVI.

By studied tactful and diplomatic approach you can usually lead a set owner to accept the installation of a high-pass filter for his receiver to cure amateur TVI where the need is shown, but you cannot always convince him he should personally pay for the device he feels is required for the convenience and necessity of the amateur next door.

* Associate Advisor, Washington, D. C., TVI Committee; 1110 Lake Boulevard, Annandale, Va.

For nearly two years the groundwork has been laid for the coöperation of some 30 manufacturers of TV receivers in correcting amateur TVI due to inadequate attenuation of signals outside the television band in their receivers *now in use*. This part in the over-all plan has been the immediate concern of the WTVIC. The WTVIC and associates wish to express appreciation for the earnest coöperation of the manufacturers and their representatives in the Washington area in this endeavor. Their material help in resolving these cases has made feasible continuing friendly coexistence between amateur and neighboring television set owners. Recently two manufacturers acknowledged the receipt of several TVI complaints by long-distance telephone calls to set owners and amateurs involved, and in addition, within a few days had dispatched one or more field engineers for a personal investigation of the interference complaints. During the past year of its investigations in only two instances has the committee been unable to secure from a manufacturer a high-pass filter or other necessary remedy to cure amateur TVI. In one instance the receiver was no longer in production. In the second, the receiver was of unknown manufacture.

Local Distributor Coöperation

It is well to realize that in many instances the manufacturer reimburses his local service representative for the necessary filter device only. The set distributor absorbs the cost of the installation. Several distributors in Washington have continued over a period of two or more years to offer this voluntary service because of personal pride in their particular set, and in the interest of maintaining good customer relations.

It is not unusual for one service company in the Washington area, when apprised concerning cases of amateur TVI investigated by the committee, to schedule a service call for the next day or two following receipt of the complaint.

In view of these circumstances the Washington committee has continued to promote a public spirited program to assist the manufacturer and serviceman — to make the participation of these agencies, particularly that of the service technicians, most intelligent and effective.

The Service Technician

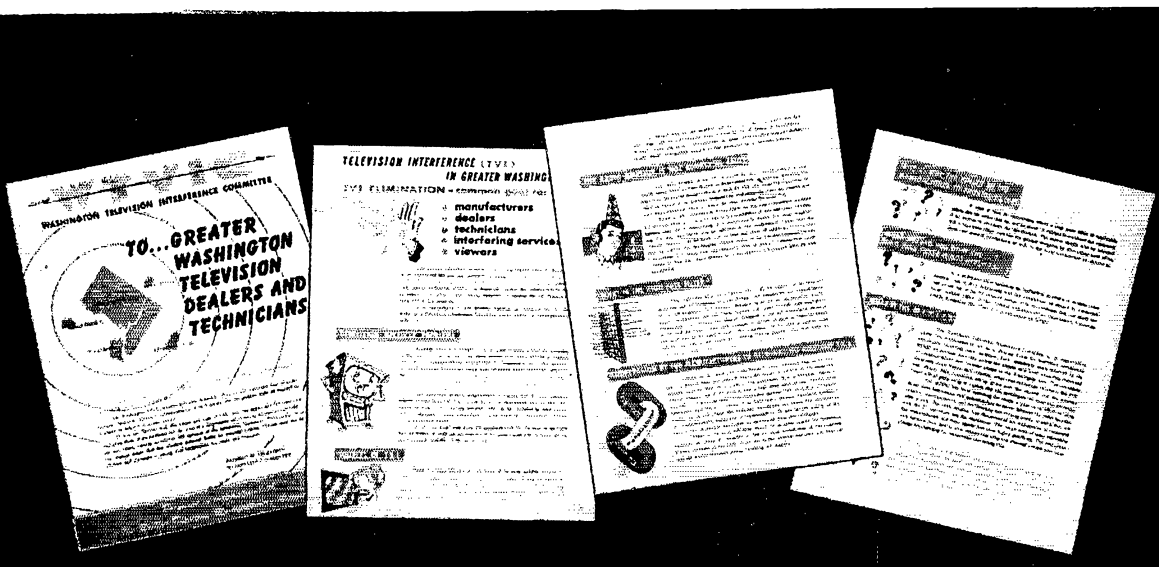
Whether the set manufacturer is one of those coöperating or not, the TV service technician — the man who is called upon to do the work, and who is entrusted in this work by your neighbor, can make the committee plan an instrument of good will, or through lack of complete understanding, interest, or technical know-how concerning all phases of TVI, give rise to further dissension between set owner and amateur.

An isolated instance will serve to illustrate the latter possibility. Recently a serviceman, instructed by his agency to install a high-pass filter to correct a receiver overload condition, expressed to the set owner doubt with regard to the value of the filter, and furthermore warned that the device would offer serious picture degradation. Lack of understanding of the principles on which high pass filters operate is apparent in all such cases. What is required is more effort being put forth to properly educate such persons.

The manufacturers service representative and independent service technician must be well informed concerning the causes and cures for TVI. He must be able to differentiate between the numerous causes of TVI, of which amateur radio is only one. He should know the degree of responsibility of the amateur for TVI. This knowledge will in time eliminate the possibility of misleading remarks such as those described.

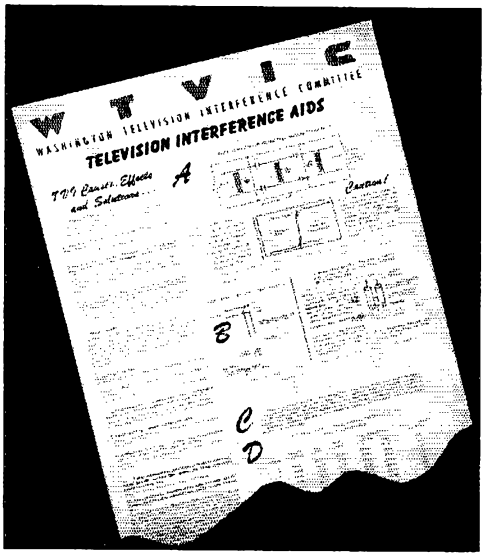
The interest and close support of such agencies as the RETMA and the Electric Institute have been of inestimable value in this endeavor. Several TVI lectures and demonstrations for servicemen have been sponsored by the committee with the earnest collaboration of these organizations.

This four-page color folder, prepared by the TVI Committee and produced by RETMA, was distributed to dealers and technicians to tell the story of TVI sources, receiver problems, amateur interference, high-pass filters, manufacturer coöperation, and committee services. Other TVI Committees may obtain sample copies from the author.



Manner of Presentation

The WTVIC has strived to create an atmosphere of continued mutual understanding and interest between amateur and service technician. In order to effectuate an acceptable program the committee has endeavored to understand the



Common TVI remedies are charted in this poster, one of a series distributed by the committee.

viewpoint of the industry as a whole. This study showed the need for the use of the same tact and diplomacy in working with industry, as has been found highly desirable if not mandatory for contacts with the set owner. Therefore, in its meeting with industry and in its publications the committee, in coöperation with industry and other interested parties, has endeavored to state hard facts in soft words to facilitate the most cordial acceptance of its program by the industry as a whole.

Recently, a survey conducted of TV service managers in the Washington area suggested that, in conjunction with lecture-demonstrations for familiarizing busy service technicians concerning TVI, concise written material, with eye-catching visual aides could add immeasurably to the accessability and retainment value of the information supplied. The WTVIC pamphlet and poster is an example of an effort of the committee to "feel out" the potentialities inherent in this method of approach. These publications were carefully planned, with the advice and concurrence of all agencies concerned. As such they exemplify that, under congenial circumstances, everyone involved in TVI *can* work together unselfishly, toward a common cause in the public interest.

The results obtained by circularizing these publications have been highly gratifying. For example, soon after the distribution, two members of the committee conducted personal surveys of Washington area TV service shops for a sampling of how servicemen were now answering calls for information concerning receiver troubles involving interference effects. All contacts, typically, indicated a marked change in the attitude of the serviceman toward TVI. No longer was he indiscriminately pointing to the amateur as the most likely cause of interference effects. Several servicemen, in answering calls for information appeared to be quoting from the WTVIC letter. One Washington service company has begun the distribution of literature making known the fact that it specializes in "tracking down sources of interference."

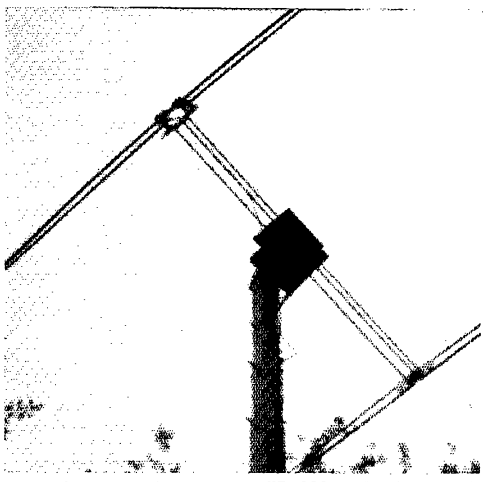
What is the WTVIC "Master Key" for opening all the doors leading to the wholehearted participation, of those concerned with TVI, in reaching the final solution to the problem? In the foregoing paragraphs are to be found the clues leading to the answer.

Let us associate "TVI" with these words: *T*olerance is *V*itally *I*mportant. Belligerency never begot wholehearted support for any program — no less as controversial a matter as TVI reduction. Temper your words and actions toward those who can help you, and those you are helping. Then, the facts you are attempting to put across will not be buried in unreasoning resentment.

The Washington committee wishes to extend its heartfelt appreciation for the constancy of the many agencies and persons who have helped the committee plan develop, and to the hundreds of other committees across the country for the part they have played.

The WTVIC earnestly asks your help in furthering its program on a national scale. What are your opinions? The committee will be very happy to hear from you.

Strays



As shown in this picture, W2CN finds that single 10-foot sections of TV-type mast make sturdy boom material for ham-style rotaries. Adolph commends such construction for (a) a very low cost, (b) lightness, (c) minimal wind resistance, and (d) strength sufficient to withstand heavy gales.

Communications in Civil Defense

A General Portrayal of the Problems Involved, and Where the Amateur Service (RACES) Fits into the Picture

BY JOHN G. MORRIS,* W3IFS

CIVIL defense communications require the integrated use of all existing communications facilities, both wire and radio. In addition, to serve needs for which there are no existing counterparts, additional communications facilities which are purely for civil defense purposes will have to be established. These requirements impose a considerable problem in education, both in connection with utilization of existing facilities and in the creation of new facilities for civil defense purposes.

The problems require a bit of background to be fully understood.

Enemy Capability

The need for civil defense communications is dimensioned by the extent of enemy capability. While detailed estimates of Russian capabilities lie outside the scope of this article, it is clear that they include the ability to make a simultaneous mass attack on a large number, at least, of the metropolitan areas and industrial centers in the United States, employing both atomic and other weapons. This would be true, under saturation attack conditions, in spite of the capability of our Air Force to oppose them; Air Force officials have estimated publicly that as high as five to seven out of each ten planes might get through to target. Not all of the enemy planes would be expected to carry atomic weapons; many might be primarily for protection, and would carry other types of war instruments.

Any such mass attack as indicated would impose a huge burden of extra traffic on the entire national communications network at the same time that emergency conditions might seriously impair the traffic capacity of the system.

Civil Defense Plans

Communications, and dissemination of warnings to the public, are two of the major elements of the responsibility placed on the Federal Civil Defense Administration by the Congress, by Public Law 920, 81st Congress, 1st Session. The two subjects go hand in hand. The Federal responsibility for delivering warnings extends to one or more key points in each State, at which point the States jointly with the Federal Government have responsibility for fanning out the warning to sub-key points and so to the public. The warning originates with the Air Force, and is furnished to Federal Civil Defense Administration personnel at Air Force Air Defense Control Centers. The Federal Civil Defense Administration operates the communications network connecting the various Air Defense Control Centers with the more than 200 key points; the operation of communications systems from there downward, and the activation of public warning devices, are State and city responsibilities.

The amount of warning time on which any given city can count, with an acceptably small proportion of risk, is an important element of civil defense planning. As the time which can be counted on increases, cities can plan not only more, but different kinds of preparation.

These facts make it necessary that there be extensive pre-planning of civil defense communications and communications facilities, as well as for the extension of those facilities or the addition of new ones for civil defense purpose.

The Amateur Service is an existing facility;

* Deputy Chief, Local Warning & Communications Systems Division, Federal Civil Defense Administration.

Operators of hand-carried "handy talkies" should always be thoroughly briefed before taking such units into the field. In the left picture W9KLB briefs a Chicago group prior to a civil defense exercise. At the right, we see one of the units in actual emergency operation during the flood in Omaha, 1952. In a highly mobile situation such as that illustrated below, use of portable radiophones fills a need for which wire facilities are usually not practical.

it can be extended and readily adapted for civil defense purposes — extended to provide increased personnel and equipment, and adapted to make full use of the opportunities provided under the Radio Amateur Civil Emergency Service (RACES).

Existing Facilities and General Location

There are many existing communications facilities other than the Amateur Service. Few amateurs realize how many and extensive they are, and it may be worth-while to discuss a few of them briefly.

The wire services, first of all. Our national public telephone communication system represents an investment of over $12 billion. It is the most common communications medium and the one most familiar to the public. For that reason alone, it is the primary civil defense communications system to be established. Western Union wire facilities are also well-known and widespread and fall in the same category. In addition, there are any number of less-publicized services: teletype, facsimile, and facilities for private and special commercial services. Each has its place in the over-all civil defense communications picture.

Communications centers, both wire and radio, are usually located at the hub of activities. This hub is usually the logical point for concentrated attack. One of the many problems facing civil defense communicators is dispersion of control facilities to points *outside* the probable point of attack; the establishment of alternate control points from which communications can be effectively maintained in the event of destruction of the regular facilities. Commercial organizations which sell wire communications service are investing large amounts of capital in this phase of civil defense.

Existing radio communications facilities other than amateur are many, covering a more extensive field than in World War II. We'll consider a few of them briefly:

Police. Most police departments have radio communications facilities. Those in target areas are faced with the problem of expanding their facilities to take care of an increased load which will inevitably come with an enemy attack. It is expected that the police services in themselves will have more than any normal peak police communications requirements with little or no overage of their radio services for other than police civil defense. However, a police representative will be located in the civil defense control center to provide very necessary liaison with civil defense officials.

Fire. Although this is one of the most important services in civil defense, it can be said that, in general, its communications situation closely parallels that of the Police Service. Great expansion will be required, but its expanded facilities will not be available for *other* civil defense services except on a liaison basis similar to that outlined above.

Taxicabs. Since World War II, practically all large taxicab companies and many small ones have installed two-war radio communications equipment. These facilities can be diverted in their entirety to civil defense purposes under attack conditions in both communications and transportation. Taxi operators are especially valuable because of their knowledge of every street and alley in their city. The taxicabs throughout the nation have a great investment in communications facilities encompassing licenses for 3848 base stations and 84,115 mobile-equipped cabs.

Industrial and Land Transportation Radio Services. Radio systems used by concerns engaged in production, fabrication, construction, manufacturing and transportation must be effectively integrated into civil defense.

Amateurs in RACES

There are approximately 100,000 radio amateurs in the United States. From recent surveys, it is estimated that almost half of these five-year licensees must be counted as inactive — that is, not maintaining operative amateur radio stations. Of the remainder, only a percentage will be available for civil defense, since their normal occupational activities are of such importance to national defense as to preclude their availability for civil defense communications. Present estimates range from 10,000 to 25,000 as the number of amateur operators who will be available for civil defense. Some 200,000 persons will be required for voluntary communications services in civil defense during wartime emergencies. Until war conditions curtail general amateur activity, most amateurs are not interested in establishing their equipment away from home, as at civil defense communications centers. Likewise, few homes can be made into civil defense communications control centers for 24-hour operations with other than their owners fulfilling organizational responsibility.

However, this is not the extent of the problem. The distance of an amateur from his station when

Some amateur (RACES) groups boast quite elaborate RACES control centers. This is the one at Los Angeles, to control RACES units operating in the Los Angeles area, which is a big one.

needed brings into consideration the necessity for uniformity in equipment and operating procedure in order that personnel can proceed immediately to the *nearest* point at which they can be used. Amateurs who have mobile equipment in their cars can be particularly useful in this respect.

Civil defense requirements make it mandatory that the control center be available at all times for drills, and within minutes of a warning. Amateurs involved in their regular occupational activities will normally be unable to move to their home locations when a warning is received in order to establish civil defense communications from their stations. When the full extent of this problem is realized by those concerned, it is expected that a larger number of amateurs will volunteer their equipment for location in public buildings, where it will remain available to authorized operators who will man these locations as civil defense control centers under emergency attack conditions. Local communities will probably establish these control centers in schools and other public buildings which are adequately removed from anticipated ground zero and where these communications activities may be conducted on a regular drill basis.

As the need for versatility and mobility becomes increasingly more apparent, many cities are providing mobile communications units like the above. Besides communications gear, these units carry floodlights, a public-address system and the maximum that room will allow of other civil defense paraphernalia. Independent generation of electrical power to run all equipment is of course a "must."

Other Civil Defense Communications Considerations

At this time not more than 15 minutes' warning of an impending attack can be assured under present conditions. There are three phases of an enemy attack: pre-attack, attack, and post-attack. Of these three, the first and last are most important and will require the most communications facilities. Little can be accomplished during an attack even though it lasts for some time. Pre-attack is a matter of planning; post-attack is the time to implement those plans. In order to discuss the vulnerability of our facilities, we must presuppose the current anticipated area of damage which will have as its focal point the hub of the target city. Within any specified distance from this hub, all structures housing communications facilities expected to remain in operation must be especially designed for this purpose. Where existing facilities are now located within the five-mile radius of probable ground zero, alternate communications centers for these services should be provided. Because of ever-increasing enemy capability, much greater distances from anticipated ground zero should be considered. Emergency power is a "must" for communications installations since it is almost certain that commercial power will be cut off.

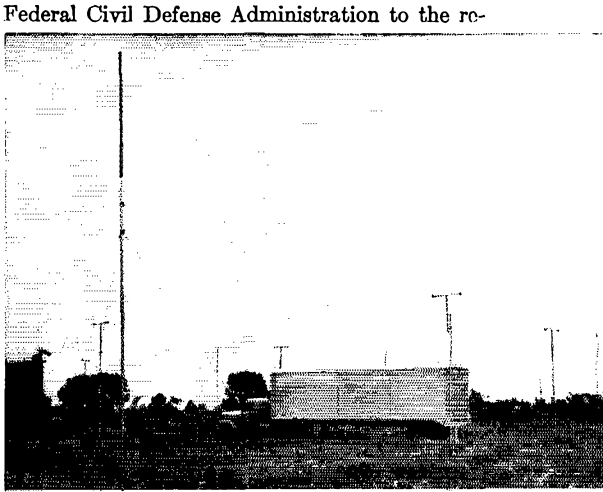
Since all services depend on communications for the efficient operation of their facilities, it is necessary that restoration plans be well established in advance. These plans should include the maximum use of portable facilities which can be stockpiled in strategic places to become available as determined necessary by the attack. Existing facilities should be used wherever possible, including radio facilities to bridge wire-line gaps.

Mutual Aid and Mobile Support

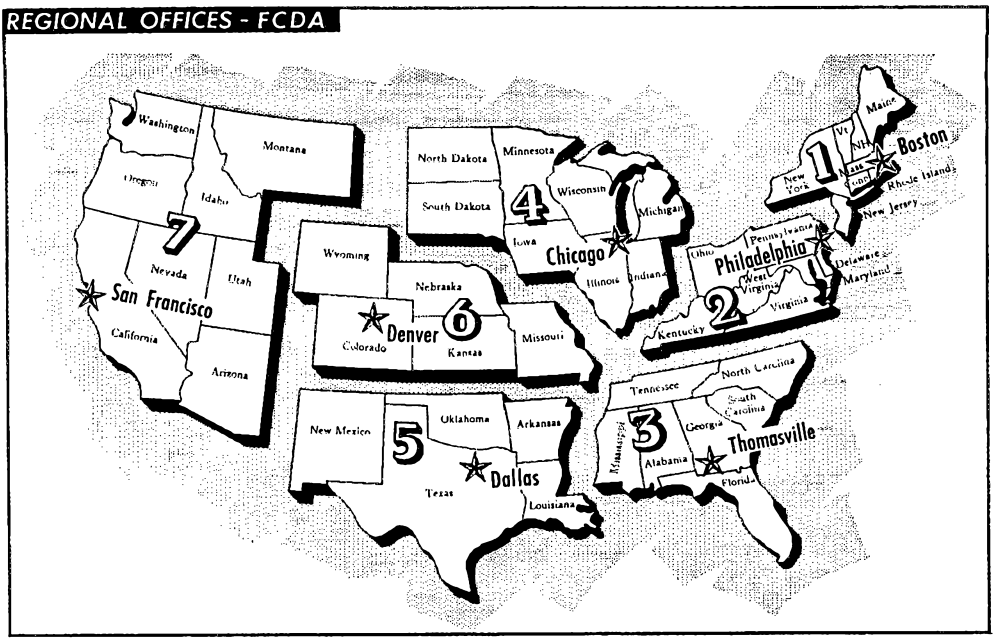
In populated areas, some communities have made pacts to come to each other's aid in time of need, and detailed planning includes the supposition that the target city will require such assistance. This is called *mutual aid. Mobile support* provides the same assistance as mutual aid, but it is required only in unusual disaster conditions which cannot be met by normal facilities (with mutual aid). Mobile support must take into consideration a number of target areas and be able to move to the aid of the one or ones most in need. Such support must be centrally coördinated so that it may be dispatched to the places where it is most needed. Generally, maintenance of mobile support forces is a function of the State.

Civil Defense Chain of Command

The natural chain of command is from the Federal Civil Defense Administration to the re-



Complete mobile civil defense communications control centers, including both wire and radio facilities, should be available for field operation on very short notice.



gional offices, and from regional offices to the several States within each regional boundary. At present, there are seven such regions, as indicated on the accompanying map. When any State requires assistance beyond the capability of the State government, it requests assistance from its FCDA region, which may obtain such assistance from other States in the region which are in position to render it, or from Federal supplies. Continuous and accurate evaluation of the situation is thus required at regional level. When the total requirements of all States in a particular region are beyond the capabilities of the region, FCDA National Headquarters will determine what additional assistance can be made available from other regions.

For civil defense purposes, States are divided into regions, areas or zones — the terminology is not standard. These subdivisions are further divided into counties, municipalities or target areas, depending on maximum feasibility and workability. Target cities are subdivided into zones, zones into report centers, and report centers into block warden posts. Communications facilities must, of course, be established to follow the chain of command.

Control Centers

A control center may be established at any of the above levels in the chain of command having jurisdiction over a definite area. The control center director will have on his staff personnel for the operation of the various civil defense activities. In a city, such personnel may be the police chief, fire chief, director of public works, chief warden, etc., and, of course, a communications officer. The communications officer would have on his staff representatives from civic communications services, including the telephone company, utilities, taxi, amateur (RACES) radio, and other services. Every target city will have a main control center, and large cities will also have alternate main and "zone" control centers, each zone covering about 140,000 people and operated similar to the main control center but at a lower level. Smaller cities with less than two zones of 140,000 people may wish to set up more control centers with fewer facilities in each one, in order to fulfill diversification requirements in their civil defense plans.

Control centers will establish communications facilities for purely civil defense functions, including provision for tying together all potentially useful existing facilities. Communications facilities in and out of control centers should include all possible protection against disruption during enemy attack.

Report Centers

For communications purposes, zones are broken down into smaller areas called report centers. These facilities would be operated in conjunction with the District Warden Command Post, normally one post to about 12,500 people, and would be principally wire backed up by portable radio facilities. Communication by radio would be mainly for the purpose of contact with the zone control center. Automobile storage batteries should be used to power such facilities since they are common and readily available. Report Center radio facilities should all operate on the same frequency to allow maximum flexibility for the establishment of new report centers where and if needed. It is not expected that fixed radio communications will be available for any level lower than report center. Places which have telephone trunks and alternate routings available are desired for report centers, and it is therefore hoped

that plans would not need to envision radio backup for more than about 20 per cent of these report centers.

Mobile Control Centers

Mobile Communications Control Centers can be of utmost value in civil defense planning, and FCDA gives every encouragement for the establishment of such movable facilities either in addition to, or in lieu of, fixed control center facilities. While it is true that a mobile control center cannot furnish all the operational requirements of a fixed control center, communicationwise it can be almost as complete, whereas other requirements can be established at some undemolished or strategic point subsequent to an attack. The mobile unit should contain emergency telephone as well as radio facilities. Kept in a safe place (out of target area or in a protected spot) prior to attack, subsequent to attack it could be moved adjacent to an undamaged or only slightly damaged building, its PBX unit connected to undamaged trunk lines, its radio facilities activated. The mobile control center then becomes the communications message center normally associated with control center operations.

Natural Disaster Communications

Amateur radio operators are well aware of their contribution to emergency communications under disaster conditions. The American Radio Relay League has done an excellent job in organizing amateur radio emergency communications systems in order to meet the requirements imposed by natural disasters. The FCDA would like to take a more active part in coördinating the efforts of amateur radio operators in natural disaster activities. The FCDA is responsible not only for the development of civil defense plans to insure protection against enemy aggression, they are also responsible, by direction of the President, for administration of the Disaster Relief Act which provides Federal assistance in areas affected by disasters from natural causes such as fire, floods, tornadoes, hurricanes, droughts, etc. This responsibility includes among other things coördination of activities of all Federal governmental agencies by FCDA for the relief of any stricken area.

At the present time, as soon as the governor of a State determines that disaster conditions are beyond the capacity of the State and local public bodies, he may appeal directly to the President for assistance. On the basis of such request, the FCDA is authorized to investigate conditions, on behalf of the President, and report its findings directly to him with appropriate recommendation for action by the President, if required. If such disaster evidences the need for Federal assistance beyond the capacity of the State and local public body affected and beyond the statutory authority and/or appropriations of other Federal agencies, funds may be made available to assist in combatting the conditions in the stricken area.

When civil defense communications are properly implemented they will be able to cope with warning and alerts of any impending natural disaster and close follow-up where required. For this reason, it is desirable that the present AREC work closely with State and local civil defense communications systems in order to provide an adequate communications system.

Personnel and Services

Civil defense communications demand more coördination and coöperation than any other civil defense facility. In many cases, individuals or organized groups have offered their services to civil defense, but in some instances local civil defense has not been ready for the services which were offered. In many cases, the paid civil defense staff of a community consists of one, two, three, or four people, an insufficient number to cope with the multitude of problems which arise in planning.

Communications are a very important part of this staff operation. Close coördination between communications officers and all other civil defense services is required. All are required to coöperate, but too few are available to coördinate. The progress of the coördinators is sometimes slowed by those people attempting too early in the planning stage to coöperate. Efficient progress in any program is dependent upon the stage of development of all programs within the local civil defense planning. We amateurs should strive to be more understanding, knowing that coöperation in the public interest requires an approach which dovetails our own capabilities and desire to help with the plans and needs which the community must develop. Our radio efforts should be directed toward coördination with the community civil defense plans. We amateurs need to implement our RACES regulations to justify the confidence and reliance placed on us in their enactment.

We have a job of selling ourselves by careful representation and demonstration of local net operation, traffic handling, deployment of mobile radio units for any special community event, including utilization of AREC/RACES patterns in a practical exercise. We must make our demonstration timely, of course, and such as to fit into the whole local communications program, remembering that this part *alone* is not the entire solution to civil defense needs but that it can make a very substantial contribution when supported and integrated with all other efforts. It is hoped that this article will give a clearer picture of the complexity and broad aspect of the whole civil defense program.

An encouraging number of RACES plans of States and their subdivisions have been presented and approved by FCDA and FCC. As of May 15, 1954, there were 114 RACES programs completed for 21 States and 93 local areas. Still more are coming into being with each passing day. In articles which will follow this over-all picture, we hope to offer some recommendations which may serve as a more specific official guide in planning and implementing phases of RACES down to operational and organizational levels.

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

A "W" YL Tours Africa

(But not by camel alone!)

Probably not too many of us will ever have the opportunity to make an extensive journey about Africa, as W6NZP, Evelyn Scott, was recently able to do; but it's interesting to hear about some-

W6NZP astride a camel near the pyramids of Egypt

one else's experiences on such a trip — especially when hams figure prominently in the story. Here are some of the highlights of W6NZP's excursion, as related by Evelyn herself:

Africa should be as famous for the hospitality of its hams as it is for wild animals and savages. This is my outstanding impression after seven months traveling throughout the Dark Continent.

Arriving in Johannesburg last August, the OM and I were welcomed by Diana Green, ZS6GH, who visited the States several years ago and met the girls of the Los Angeles YLRL. Diana and her OM, ZS6J, staged a party for us with more than 20 hams present. A few days later I was the honored guest at a YL luncheon. During the two weeks that we stayed in town, the Greens really took us around. From then on we were literally passed from hand to hand by the so hospitable South African YLs. Diana passed the word to her many friends in the Union and they in turn contacted others along the route of our itinerary. The result was that at every stop a "reception committee" awaited us.

At Kimberley, Donna, ZS4FR, and George Winter, ZS4CT, showed us the town. Came Cape Town and we received a royal welcome from Pat Woodland, ZS1MU, and her OM. They drove us all over the Peninsula and down to the Cape of Good Hope, one of the most marvelous scenic drives in the world. Oudtshoorn was the next stop, where Rose Kaplan, ZS1NY, and her OM entertained us for several days. They took us to the famous Ostrich Farm (where I rode an ostrich), Cango Caves, and Wilderness Resort. Then another happy visit at "Poplar Grove," about 20 miles from Queenstown, as guests of Iris Hayes, ZS2AA, and her OM on their huge sheep ranch. Traveling to Durban, we were entertained by Muriel and Albert Neill, ZS5KG and ZS5GK; Sylvia and Bernie Shane, ZS5TL and ZS5TK. Our next stop was Empangeni, in Zululand. We were met at the train by Meg Ross, ZS5DF, who insisted that we stay at her sugar plantation. It was thru Meg's OM that we were able to take an overland trip thru Zululand and Swaziland, traveling on native buses through parts of the bush inhabited only by Zulus and Swazis. On this safari we stopped at Mtubatuba and were again royally entertained by Derrick (ZS5OH) and Priscilla Dooley; Gus (ZS5AW) and Ann Liesenberg. A highlight of this visit was a fishing trip to St. Lucia on the Indian Ocean, and our first glimpse of crocodiles in the lagoon. In Salisbury, So. Rhodesia, we were the guests of Molly, ZE1JE, and Dr. Henderson, where I had the first opportunity to work Ws. In South Africa only the station licensee is permitted to use a rig; third-party messages are taboo. We next journeyed to Bulawayo, where we visited Cynthia and Arthur van der Bijl, ZE5JY and ZE5JL. Our next "port" was Livingston, near Victoria Falls, where I again talked to several Ws while using the rig of VQ2PL, Pete Lowth. In upper Rhodesia we were guests for several days of VQ2MH, Capt. G.

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

On April 24th twenty-nine New England YLs met at Framingham, Mass., for the fourth annual W1 YL luncheon. Arrangements for the get-together were made by W1UKR, Eunice; W1SCS, Ruthe; and W1RYJ, Esther. OM W1PU, Sylvester Ahola, of Gloucester, Mass., trumpeter of world renown, delighted the girls (and the restaurant management and other patrons) with his trumpet wizardry. The possibility of a YL "Convention" to be held next year was discussed, and a Committee (W1s RLQ RYJ SCS SVN TRE UKR ULF VYH VOS WIT ZEJ and QON) was formed to give the matter further consideration. The YLs included in this photo are, *seated l. to r.*: W1s UQA UKR SCS RYJ BCU, WN1YFV. *Standing*: W1s UPF VOS FOF TUD ULF RLQ TRE SVN VYH OME UPK WIT WGE ZEJ HIH VBT MWI WNT WJJ ZJE ZIB YYM and ZID.

McEwan-Hannah and his XYL. "Mac" saw us safely on the train (and what a train!) en route to Elizabethville in the Congo. Some distance out of "E'ville" we visited station OQ2AC at St. Francis de Sales College. Father Dethy, the operator, puts out a twice-weekly broadcast on 7200 kc., playing records and giving readings, this being the only "broadcasting" station in that isolated part of the vast Congo. (In Africa, receivers are invariably of the "all-wave" variety.) While waiting in the railway station at Leopoldville, a chap dashed madly thru the gate to catch his train, and as he did so he dropped a packet of mail. Immediately I spotted a "W" QSL! The fellow turned out to be OQ5BQ, Maurice Plumen, who had just received the card in the mail, having worked the W who was mobile at the time. I don't know whether Maurice caught his train or not, but we had a nice rag chew! In Stanleyville we were entertained by OQ5LL, Andy Lippens, and his XYL. Andy tried desperately to raise some Ws for me but without success. In Kisenyi, we spent the Christmas holidays and visited with Jean Blondel, OQ5CZ. In Jean's *volkswagon* we traveled 400 miles through jungle and bush to Kampala in Uganda. A few hours out of Kampala, we came to a most elaborate roadside sign announcing "Equator" — and a broad yellow band that cut diagonally across the road! After Kampala, our next major station was Nairobi, center of the Mau Mau disturbances. Here we met George Dent, VQ4AQ, and I had the thrill of a lifetime when I broke into a 20-meter W YL net and talked to several of the girls at home. As a fitting climax to a wonderful and exciting tour, we stopped over in New York City on the way home to Long Beach and dined with W2JZX, Vi Grossman, and then attended a Long Island YLRL meeting with Vi and Madeline Greenberg, W2EEO.

What a trip! Memories enough for a lifetime. As chairman of amateur activities for the Eighth Annual All-Women's Transcontinental Air Race to be held this month, Evelyn returned home to a full schedule too.

First licensed in 1936, Evelyn has also visited hamshacks from Alaska to almost the tip of South America. Ten and twenty meters are her favorite bands, and you can bet she is ever alert for band openings to Africa!

YLRL Election Results!!

Received just at column deadline time are the following 1954 YLRL election results. More information about the new officers next month.

President — W6CEE, Vada Letcher

Vice-President — W6KER, Gilda Shoblo

Secy.-Treas. — W3UUG, Miriam Blackburn

Editor — W9SJR, Bernice Schmidt

Publicity Chairman — W3OQF, Barbara Houston

District Chairmen: W1VOS, Marjorie Snow; W2JZX, Viola Grossman; W4RLG, Frances Shannon; W5TTU, Patricia Parks; W7SBS, Luryne Conner; W8SPU, Helen Smith; W9LOY, Alice Bowlin; WØERR, Anna Belmonte; VE3AJR, Olive Daykin; KZ5DG, Grace Dunlap.

W3, W6, KH, and ZS chairmen to be announced later. New term commences July 1, 1954.

Keeping Up with the Girls

From W7HHH, Bea, we hear of a near-tragedy with a happy ending. KL7RN, Jeanne, and her OM KL7IS, Dick,

On the same day the W1 YLs were meeting, (see p. 60) sixteen W9 YLs and XYLs formally dedicated their new amateur station, W9DEQ. Founder and president of the Chicago YLRL unit, Grace Ryden, W9GME, believes that the Chicago YLRL group is the first to have its own amateur station. The station, located at the Gompers Park Field House, at present is capable of two-meter operation only; however, an all-band transmitter is in the offing. Code and theory classes soon will be part of an active program conducted by the unit. Members and interested visitors are, *l. to r.*, W9SEZ, Eleanor (Secy.); W9OMZ, Jeanne; W9MGT, Leonore; W9QV, Ethel; W9ZNQ's XYL, Ruth; W9SPI, Marge; Laura Balbert; Betty Daursh; W9SSL, Shirleen (Sgt.-at-Arms); W9BCB, Helene; Judith Shulin; Joy Sobota; Betty Wallner; Virginia Movriesk; Ruth Day; and W9GME, Grace (Pres.) at the mike. (*Chicago Tribune photo*)

were flying supplies to a mountain climbing party when a downdraft caught their plane and caused a crash-landing at 7000 ft. on Mt. McKinley. The plane was not badly damaged in the crash, but winds up to 120 m.p.h. reduced it to a pile of rubble and battered Jeanne and Dick for five days until they were rescued by an Army helicopter. Jeanne was badly sun- and wind-burned; her hair was so tangled by the wind that she had to have most of it cut off. Otherwise, she and her OM came through all right — both with much praise for the hams who aided in their rescue. . . . YLRL Vice-Pres. W2OWL, Ruth, announces that cups are being awarded to second-place winners in this year's YL-OM Contest in addition to the certificates indicated in the contest rules published in the March column. Second-place winners were: YL 'phone, W1SCS; YL c.w., W9JUJ; OM 'phone, W8AJW; OM c.w., W9VBZ. . . . ZS1NQ, Gwen Smith, is the new Editress of the South African Women's Radio Club paper *YL Beam*, ZS1GT, Daphne, having recently resigned from the job. . . . Thirteen-year-old Merceda Pilla of Bordentown, N. J., has removed the "N" from her call and is now K2DSL (see June *QST* for photo and write-up). . . . W4DEE, Beulah, of Falls Church, Va., would like to help organize a YL club in the Wash., D. C., area. . . . On a trip to Florida W8ATB made special "side visits" to meet 10 YLs, making a total of over 100 YLs Esther has met in person. . . . Third YLRL District Chairman W3SVY, Loreli, enjoyed some "real good Southern hospitality" when she recently visited Arlie, W8HLF. . . . From W4LAS, Mabel, we learn that ex-W4TVT, Claire, is now VP4BC, the first and only YL in Trinidad. Mabel recently enjoyed a rag chew with W2ZXM, Capt. Kurt Carlsen, who was maritime-mobile in the Canal Zone. . . . W1VXC, June, of Providence, R. I.; W2GPK, Sylvia, of N. Y. C.; and W1QON are three proud mothers of new harmonica born in April. . . . W6PIR is happy to announce her marriage on April 18th. Mary is confident that her new OM will make a good ham when he gets a license. . . . W1ZEF of Stratford, Conn., now has her General Class license. Eleanor, if you recall, is the YL with the "mostest" children — nine! Congratulations to her on both accounts. . . . W1YYM, Ellen, ARRL Asst. Comm. Mgr., 'Phone, reports the following: YLs who participated in the 1954 Novice Round-up were: WN1s YJB YNI YWT ZID, KN2DKU, WN4BLR, WN5BHA, KN6CQT, WN8OIM and WN9ZXZ. WN4BLR,

(*Continued on page 130*)

HAMFEST CALENDAR

GEORGIA — Annual Augusta Camp Gordon Hamfest, Sunday, July 25th, at Lake Olmstead on the edge of Augusta, Georgia. This promises to be a bigger and better get-together than last year's. The price of a ticket includes entertainment, good beverages and a feed by that famous Southern chef, "Goat" Harris. Bring the kids and XYL and let them enjoy the time of their lives. Hamfest officially commences at 9 A.M. so come early.

IDAHO — The W.I.M.U. (Wyoming, Idaho, Montana, and Utah) Hamfest will be held at Big Springs, Idaho, on August 6th, 7th and 8th. (Site is twenty miles south of West Yellowstone, Mont.) There will be contests, awards, hidden-transmitter hunts and other events. Cabins, camp grounds, and commercial power are available. Those wishing to attend may make reservations early by writing one of the following: Big Springs, Idaho; Macks Inn, Idaho; Andrew's Cottages, Macks Inn, Idaho; Island Park Lodge, Idaho; Ponds Lodge, Idaho. Registration fee is $1 per licensee. The mobile frequency is 3935 kc. For further information write W7MXM or W7NVR, Eugene L. Clayton, Pres., or Opal H. Clayton, Secy., W.I.M.U. Hamfest, Route 2, Idaho Falls Idaho.

ILLINOIS — The Central Illinois Radio Amateur Picnic (formerly Weldon Springs Picnic) will be held Sunday, July 18th, at Spitler Woods State Park, six miles southeast of Decatur, Ill., on State Route 121. Registration will open at 11 A.M. CDT and there is no charge for admission to anyone interested in amateur radio. Lively contests for the kids. A real family affair with the only price of admission a smile on the face and a desire to get together with the gang. There will be a ham auction and a swap table for the extra gear around the shack. Bring the family and a basket lunch. Drive east of Decatur, Ill., on U.S. Highway 36. Watch for the Ham Picnic signs.

MARYLAND — The annual Picnic and Hamfest of the Maryland Emergency 'Phone Net will be held at Gambrill State Park, Frederick, Md., on Sunday, July 11th. Activities will start at 10 A.M. This is a family picnic affair. There will be contests, games and fun for all. Bring equipment or what-have-you for the famous auction.

MICHIGAN — Sunday, July 25th, at Warren Dunes State Park, 15 miles south of St. Joseph on Lake Michigan, on U. S. Highway 12 — annual Picnic and Hamfest of the Blossomland Amateur Radio Association. Bring the family, a basket lunch, and swimming gear; also usable radio equipment for swap and shop. Ten-meter transmitter hunt. No admission charge to the park or picnic. Registration fee $1.00 in advance or $1.25 at the park. Please make reservation in advance through Al Carpenter, WN8ORM, Secy.-Treas., 2503 Langley, St. Joseph, Michigan.

PENNSYLVANIA — South Hills Brass Pounders and Modulators 16th Annual Hamfest, Spreading Oaks Grove, South Park, Pittsburgh, Penna. Sunday, August 2nd, noon 'til ????? Refreshments and games. For further information contact W3LDB, 4949 Roberta Drive, Pittsburgh 36, Penna., or phone WI 1-7025.

TENNESSEE — The Mid-South Amateur Radio Association of Memphis, Tenn., will hold its second annual Hamfest at Ellendale, Tenn., near Memphis, on Sunday, July 18th. Contests, games, exhibits and hams will be plentiful. Last year over 400 amateurs from 13 states attended. Meet your friends in Memphis on this date. Advance reservations should be addressed to W. H. Pearre, M.A.R.A. Secy., 2977 North Radford Rd., Memphis, Tenn. Supervised play for the children, wonderful food and drink. Advance reservations for adults $1.50, children $1.00 (at the gate $2.00 and $1.25).

COMING A.R.R.L. CONVENTIONS

July 3rd–4th–5th — Pacific Division, San Jose
Oct. 2nd–3rd — West Gulf Division, Kerrville, Texas
Oct. 10th — New England Division, Manchester, New Hampshire
Oct. 16th–17th — Midwest Division, Des Moines, Iowa

TENNESSEE — Fourth Annual Crossville Picnic — Sunday, July 11th, at Cumberland State Park, located 5 miles south of Crossville, Tenn., which is on U. S. 70 about 100 miles east of Nashville. This is strictly a picnic. Bring food for your group, breakfast and lunch. Plenty of activity, including swimming and fishing. An ideal summer location high in the Cumberland Mountains. Picnic is absolutely free! We had 218 last year — let's double it this year. For further details write W4NJE.

WYOMING — The annual Wyoming Hamfest will be held Saturday and Sunday, July 24th–25th, in the beautiful Big Horn Mountains. Camping or cabins in the area will be available. The two-day program is being sponsored by the Sheridan Amateur Radio League. Write Robert B. Miller, W7QPP [illegible], S.A.R.L., 362 E. Loucks St., Sheridan, Wyoming, for further information.

ALBERTA — Glacier Waterton International Peace Park Hamfest at Waterton Park, Alberta, Saturday and Sunday, July 17th–18th.

NOVA SCOTIA — Maritime Hamfest, Saturday and Sunday, July 3rd–4th, at Hubbards, Nova Scotia (30 miles west of Halifax on Highway 3), sponsored by Ethel Wooff, VE1AAW, and OM Doug. Advance registration fee includes meals and lunches from Saturday through Sunday. OMs $2.50 each, YLs and XYLs $2.00, Jr. Ops. $1.00. A cordial invitation is extended to all hams, their families, and interested parties. Contact Mrs. Ethel Wooff, VE1AAW, Hubbards, N. S.

NEW BOOKS

Two books on the subject of radio at strictly pre-amateur level have recently appeared and may be of use to those who are looking for suitable material to create or help along a spark of interest in amateur radio on the part of youngsters.

All About Radio and Television, by Jack Gould, Radio Editor of the *New York Times;* published in 1953 by Random House, N. Y. C.; 9¼ × 6¾ inches; illustrations; index; references; 160 pages; price $1.95.

Another in the series of "Allabout" books which have previously treated such subjects as the telephone, weather, and dinosaurs in a style aimed at the age 8–10 group. This profusely-illustrated volume begins its explanation of elementary communication principles with the time-tested rock-in-the-pool example of wave trains; by a great many similarly-basic analogies it takes the reader through sound and picture modulation, tuning and resonance, tubes, propagation, and the like. Hardly a textbook, the objective is only to help the youngster understand the basic workings of radio and television, and it does that job well for the age level involved. The only "laboratory" work is a description of how to build a "foxhole" radio — a simple headphone broadcast receiver with a razor blade and pencil lead as the rectifier. Its direct elementary approach makes it useful for most any person who is trying to learn something about basic principles from scratch.

Stand By for Danger, by E. D. Mygatt, published in 1954 by Longmans, Green & Co., N. Y. C.; 8¼ × 5¾ inches; 188 pages, including a 28-page compilation of amateur radio facts; price $2.50.

This is a fiction piece built around the amateur interests and activities of several lads at prep school. It is spiced with some involved espionage activity; of course the hams come to the rescue. That it is good reading for youngsters is indicated by its publication, serially, in *Boys' Life* earlier this year. The book should be a good feeder into ham radio, first instilling an interest in short-wave communication through a dramatic story, and ending with an extensive compilation of data on how to get started in our hobby, license requirements, code, abbreviations, Q signals, etc.

— *J. H.*

Correspondence From Members-

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

40TH ANNIVERSARY

S.S. *Alcoa Puritan*

Editor, *QST:*

Congratulations on forty years of guidance, encouragement, and sincere interest in the amateur radio operators throughout the entire world. Without the ARRL, I doubt if it would have been possible for me to have so fully enjoyed radio as a hobby for over 20 years. Very 73 to all at W1AW from W9PQL.

— *R. P. Palmer*

41 Middlefield Drive
W. Hartford, Conn.

Editor, *QST:*

The editorial in the May issue of *QST* has recalled a lot of the beginnings of the League, and it is interesting to reread KB's editorial of 15 years ago.

As far as I can ascertain, I am the only member of the original Radio Club of Hartford who is still active on the air and incidentally I have the same call letters I had in 1914. There are a few errors in the editorial which I think for the record should be brought to your attention.

In the first place, the Radio Club of Hartford was not formed in Jan. 1914, but had already been in existence several years at that time. In fact, it was formed before the law of 1912 was passed and licensing was required. It was conceived by Mr. Maxim, and Clarence Tuska was not one of the early members of the Club.

In 1914 Mr. Tuska was not a college youth but was still in high school, and as a side line was engaged in selling radio equipment of two or three of the few radio manufacturers in existence at that time. In 1914 I was a senior in Trinity College and Mr. Tuska did not enter there until September, 1915.

We, of course, did not realize that history was in the making in those early days but we were always inspired by the foresight of Mr. Maxim and I shall always cherish his memory.

— *R. W. Woodward, W1VW*

Poughkeepsie
New York

Editor, *QST:*

Tnx for that swell editorial repeat of KBW's. It brought back many, many memories of spark in 1920 to me and brought a gang of us together last night. Thanks again.

— *Irv Wolfe, W2APJ*

Willimantic
Connecticut

Editor, *QST:*

We, the members of the Connecticut 'Phone Net, would like to be one of the first to congratulate the ARRL on its fortieth anniversary.

— *W1RRE, PAM*

W. Middletown
Ohio

Editor, *QST:*

. . . We amateurs owe a great debt of gratitude to Hiram Percy Maxim and Clarence D. Tuska, cofounders of the ARRL, and also to those who have followed them up to the present time. Mr. Maxim and Mr. Tuska put tremendous effort, time and money into this organization for which we should be very grateful. . . .

Other organizations have come and gone but there is only one ARRL that has made the grade and it's been through the efforts of all who had part in making this amateur fraternity what it is today. . . .

— *John G. Hunt, W8QIE*

216 Washington Blvd.
Fayetteville, N. Y.

Editor, *QST:*

I call your attention to page 12, May 1954 *QST*, column one, paragraph five, wherein you report amateur signals first heard across the U.S.A. in daylight in December, 1924.

I know you say you are reprinting KB's editorial intact, but I'm sure Ken would never have countenanced such a base canard. (Knew I'd get to use that word some day.)

Actually, the first reported work was done between my 2ADM, then in Schenectady, and Larry Mott, 6XAD, in March of 1924. I refer you to *QST*, May 1924, page 41. How about it? Will this letter suffice, or must I send one of my agents with a well-sharpened Wouff-Hong down there to get you back in line?? As Joe Friday says, "Let's get the facts."

— *Ernest Hobbs, K2AV*

[EDITOR'S NOTE: KBW had reference to the rule that governed all the League's transcontinental tests — that the day extended from sunrise to sunset; according to this rule the 2ADM-6XAD record must be counted as real daylight work. However, since it was known that on these wavelengths of approximately 200 meters good radio conditions last some time *after* sunrise, and begin some time *before* sunset, to be sure that contacts were made under middle-of-the-day conditions it was decided to discount 3 hours at both ends of the day. This was later felt to be too rigid and the rule was modified to include any time between 9:00 A.M. and 11:30 A.M. Pacific time (or in other words, between noon and 2:30 P.M. Eastern time).]

SUBALLOCATION

628 – 8th St.
Ames, Iowa

Editor, *QST:*

Let us hope the day will come when we can pick up a new issue of *QST* and not read in the correspondence from readers where some lily-livered whining sissy is crying for a subdivision of the ham bands to suit his everlasting selfishness. Where in the universe has all the ham spirit gone? It seems as though there are a few who never want to try anything new, for the puny reason that it costs too much, or hasn't time or something, yet when a new idea comes along and a few ambitious real down-to-earth hams get going with it, then some bunch of goofs want to put it off in a place of its own. Now this has happened to single sideband transmission.

A few years ago when W9BSP here in the Middle West was transmitting code practice for an hour a night with a kw., there were a bunch of them who wanted him put off the air, or in a band out of the usual ham bands, etc. Boy was the battle on. And WHY? Just because he was getting a job done and some of the gang didn't like it.

Who does all the letter-writing usually? The one who has a complaint to make.

My observations are that the s.s.b. boys would just as soon sit on the band edges, but who takes up their rights and makes it, or I should say *tries* to make it rough, but a knuckle-head with some lost marbles who has a 3995 crystal and a kw., so he owns that freq. and isn't going to give. The gents on s.s.b. just ignore him, and with the superior system get the job done. So who cries? The jerk with the kw. talking across town on 3995. . . .

I have been hamming continuously since 1918, and never found ham radio Utopia, but it can be a lot worse if it is all cluttered up with subdivisions and further regulations. I would like to see 5 kc. for mobile, but you can bet your last buck I'm not going to ask for regulations imposed to get it.

— *C. Hoover, WØKWY*

(Continued on page 120)

July 1929

. . . Facets of the international radio situation — allocations, suballocations, "politics" and the like — are taken up in this month's editorial.

. . . Finances, *QST*, IARU, new legislation, The Hague conference plans, and traffic-handling are listed among matters dealt with at the ARRL Board session in May.

. . . League President Maxim, W1AW, contributes "DX Dreaming," a précis of the more wondrous aspects of long-distance amateur radio communication.

. . . In "Radio-Frequency Couplings," J. M. Grigg gives mathematical analysis of several coupling circuits now in widespread amateur use.

. . . "The Lunch-Kit Portable Receiver and Monitor," by Edward Braddock, W3BAY, is a battery-operated 2-tube design of convenient portability.

. . . A. R. Richards writes on "Time Relay Control of Transmitters," and Don C. Wallace, W6AM-W6ZZA, tells of his work with "High-Frequency Reception on Trains."

. . . Biological-bacteriological uses for ultra-high frequencies is the subject of "QRH Rats, Mice and Bacteria?" by William Justice Lee, W1BCY-W8AKE-W4XE.

. . . *QST* Technical Editor Westman furnishes full data on the UX-841 and 842, and Louis F. Leuck, W9ANZ, describes his file system for "Those Past Issues of *QST*."

. . . The third of a series, "W8CEO" is a complete description of the up-to-date and widely worked station of A. W. McAuly located in Oakmont, Pennsylvania.

. . . Portable work in winter, club organization hints, expedition news, 28-Mc. doings, and the latest W1MK schedules feature of Communications Department pages.

STAFF OPENING AT HQ.

A recent ARRL Headquarters Staff change has resulted in a vacancy in one Communications Department post. A licensed amateur is desired immediately for the activities analysis section. Preparation of traffic items for *QST*, analysis of general contest results, centralizing of field reports from Emergency Coördinators and traffic nets, and administrative organization work are involved. Salary is commensurate with functions, ability, and experience. Get your application in without delay; after this post is filled, applications will be held on file for other possible staff openings.

Amateurs with initiative who can work with minimum supervision after becoming familiar with their assignments are wanted. Long experience is not required. Preference will be given to amateurs interested in making their hobby a career. Write to Box A, ARRL Headquarters, West Hartford 7, Conn., stating your age, type of amateur license held, and giving a brief résumé of your experience in amateur radio. We'll send you a personnel form on which you can submit the necessary additional information about yourself. All inquiries are welcomed and will be held confidential.

Preview — DX Contest High C.W. Scores

Totals so far reported indicate enthusiasm at fever pitch as in ARRL DX Tests of yore. Increased quotas presumably livened up matters, and Old Man Ionosphere coöperated to a degree by providing fair conditions, especially in March, on all bands from 80 through 15 meters. Although 7 and 14 Mc. bore the brunt of activity, multiplier-conscious DXers found it worth while to keep an ear cocked to 160 meters during the wee hours. And even the 10- and 11-meter portions, almost forgotten of late, came in for a share of the sport. Shades of '49 and '50!

At this writing the W/VE picture looks about as follows, with claimed scores, multipliers, and contacts, and asterisks denoting multioperator stations.

W3CTJ	451,290–245–614	W8ACE	151,650–150–337
W3BES	431,970–242–595	W4ECI	150,150–154–325
W4KFC	378,351–243–521	W6RW	148,716–153–324
W2SAI*	357,280–224–533	W6FSJ	148,296–148–334
K2EDL	348,318–222–523	W6TZD	144,207–147–327
W2WZ	312,263–217–489	W6LDD*	142,128–144–329
W4CEN	297,000–220–450	W2GGL	129,558–151–286
W6TT*	259,740–195–444	W6DAE	127,020–145–292
W6AM*	243,858–194–419	W4DQH	124,734–43–290
W8FGX	243,072–192–422	W9FJB	123,432–139–296
W3JTC	235,584–192–409	W6DZZ	123,414–134–307
W6GAL/7	235,152–184–426	W3KT	122,262–142–287
W3BVN	232,254–198–391	W3EQA	122,100–148–275
W3GRF	226,980–194–390	W3KDP	119,511–147–271
W9AVJ*	217,062–186–389	W9HUZ	115,506–138–279
W3GHM	215,670–182–395	W1BOD	112,185–135–278
W4HQN	210,936–188–374	W6WB	111,612–131–284
W1NMP	210,630–177–398	W3JTK	111,024–144–257
W3ALB	208,620–183–380	VE4RO	105,774–122–289
W1TYQ	207,192–178–388	W1AZY	105,316–137–256
W2JT	200,550–175–382	W9GRV	104,490–135–258
W3GH8	184,509–171–360	W6MBA	98,651–119–277
W4KRR/4	180,075–175–343	W1TX	96,768–128–272
W3HEC	178,709–173–345	W1JEL	96,720–130–248
W6LDJ*	177,967–159–371	W3IMV*	95,976–129–248
W9IOP	174,595–163–355	W6SRF	95,760–120–266
W2AGW	172,050–155–370	W5BNG	93,696–128–244
W3VKD	165,540–155–356	W3EIB	92,880–129–240
W6YRA*	163,863–153–357	W6BUD	91,392–112–272
W9LNM	160,200–150–356	W8ZJM	91,125–125–244
VE3ZW	155,472–158–328	W9JIP	90,909–117–259
W9VUL	154,077–161–319	W8EV	90,624–128–236

Those responsible for all the excitement, our friends outside the U. S. and Canada, also accumulated some lofty totals, to wit:

KV4AA	534,720–80–2232	G5RI	61,776–39–528
KH6IJ	484,344–84–1922	EA4CH	61,344–36–570
KH6MG	432,820–76–1901	OK1MB	60,188–41–507
VP7NM	272,927–71–1283	PJ2AI	56,448–42–448
KH6PM	221,697–63–1173	ZL3OP	50,898–34–500
LU3EX	184,614–58–1061	HH3RC	50,616–37–456
VP9BF	183,330–63–970	PY3QX	46,460–46–340
VP3YG	179,630–55–1090	KX6BU	44,465–35–433
XE2OK	163,280–65–854	PAØEP	44,400–30–508
KZ5CI	161,340–60–910	PJ2CE	42,980–28–512
LU8AE	136,572–57–822	LU5GP	41,610–38–375
ZL1BY	133,680–60–746	OQ5GU	40,596–34–400
HK4DP	116,870–58–687	YV5DE	36,900–36–343
KG4AT	106,218–54–661	DL4HQ*	36,045–27–450
XE1SA	102,672–62–566	FF8AP	34,300–28–415
KH6ANK	102,237–53–643	PY2BKO	34,040–40–286
KP4KD	101,370–52–645	DU7SV	32,758–22–502
EI2X	100,980–51–660	Z86FN	32,424–42–258
PY1ADA	98,750–50–659	EA9AP	30,814–31–336
PY1TD	93,236–52–605	YN1AA	28,939–43–225
KL7AWB	91,840–35–870	JA3AF	28,886–22–446
KT1UX	82,467–33–833	KL7AUP	28,500–19–501
ZL1MQ	75,735–55–459	DL4TA*	27,002–23–400
F8SHP*	69,432–33–702	TF3MB	26,775–25–370
CO2BM	69,390–30–771	F8VJ	26,722–31–290
KB6AY	67,440–40–562	DL1DX	25,920–30–288

If your mouth hasn't started watering yet, try these: CR7LU, CX5CO, CT2BO, EAØAB, FF8JC, FK8AO, I1YCV (Trieste), KR6AA, LB8YB (Jan Mayen), LU6ZE (Antarctica), LU7ZM (South Orkney), OD5s AV AX, OQ5CP, ST2AR, SVØWE, TA3AA, VR2AS, VS6CG, VS9AS, YI2AM, YS1O, ZB2A. Their contest logs are also at ARRL.

The foregoing is only a sample. A full report will appear soon in these pages. — *P.S.*

How's DX?

CONDUCTED BY ROD NEWKIRK,* W1VMW

How:

Relatively-young squirts, Jeeves & Co. included, can hearken back to the earliest days of this thing called DX only by way of historic *QST* documentaries and the overheard reminiscences of old-timers. We missed a lot, an awful lot, of ham radio's incunabular romance and thrills. In those Old Days the scene changed fast from year to year and aspects of DXing changed with it. Take DX "yardsticks," for instance.

Circa World War I all ham DX was measured in miles, call areas and states, just as on v.h.f. and u.h.f. bands today. C.w. came along to replace spark and the boys progressed to the business of crossing the ponds. Subsequently, transatlantics and transpacifics became commonplace, antipodal QSOs became the rage and VK/ZLs found themselves DXceptionally popular. This was a period during which "heard" cards reached their zenith in value and *QST*'s "Calls Heard" pages were devoured eagerly. Next to steal the limelight was IARU's WAC award, and the envied DXers who captured WACs endorsed for radiotelephone considered that they had achieved the ultimate. They had — for a while.

Came the mid-1930s and our DX world had urgent need for another effective yardstick; there were no more continents and oceans to conquer, so the *country* came into its own [1] and the ARRL DX Century Club was conceived. Qualification for DXCC wasn't exactly "easy," nor did it border on the impossible. It filled the bill.

This unique institution has come a long way since W8CRA (now W3CRA) collected Century Club sheepskin No. 1 back in 1937, and since W1FH bagged the initial postwar membership diploma in 1947. Industrious DX hunters in more than 100 countries and all 48 United States have fought and won the battle of the pasteboards. Indeed, the present era sees the ARRL DXCC Countries List a basis for DXpeditionary endeavors to remote corners of the globe (see p. 10). The first gent to set foot on the moon may well have a stack of QSLs along ready to be filled out!

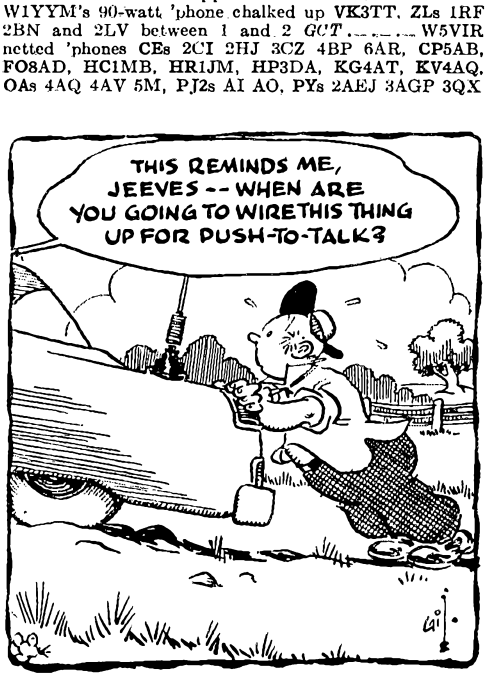
Well, all this merely by way of pointing up that W2SAW's DXCC certificate, issued in May by the ARRL Communications Department, marks another strapping milestone along the DX trail. It's the *2500th* such coveted trophy to be so awarded postwar.

What:

In the text to follow, frequencies (given in number of kc. above the lower band-limit) appear in parentheses, times without. E.g., (9) = 14,009 kc., if the paragraph deals with 20-meter work. Times are 24-hour time, zone or GCT specified, using the nearest whole-hour figure such as 7 for 0720 or 0650, 0 for 0015 or 2349.

More or less on schedule, W/VE latitudes were treated to their usual spring-into-summer high-frequency propagational resurgence. Mailbag consensus has it that the 1954 swing for the DX better was much more marked than that of a year ago. Indeed, there is evidence that dial-hand calluses no longer shall be the sole recompense for *ten-meter* partisans who never say die. Sporadic-*E* conditions hit 28 Mc. in May and a gratifying opening of Oceania-U. S. A. paths attended. The payoff, however, came later in reports of widely scattered U. S. A.-Europe contacts, the first substantial 10-meter activity over this route in years. We are indebted to harbinger W4NQM for rounding up most of the 28-Mc. news that follows. Sparkie is intensely interested in ten-meter work and sums up the situation in three words: "Things are happening!" . . . . . Miscellaneous 28-Mc. 'phone catches here and there, at *W4HVT:* VK2s ALT AQH. *W4NQM:* CO2CY, CXs 1CT 6AA, HC1MB, HP1HO, PY7VB, VP6HR, XE1BK, YV3BD, KZ5s and LUs. *W4NYQ:* VK4XJ. *W4QAA:* a CX1, DL4MC, HK4EH, PY3CR, a VK4 and some VOs. *W4TOJ:* HC1MB. *W4WVM:* CX1GG. *W5IPC:* LUs 4DZI 7DDC. *W5JCW:* CE3IT, CX2s CF CS, HP3FL, PY3AES, TIs 2BX 3LA, a VK4, ZL2s AX BN. *W5VVN:* CE2HJ, CX5BN, OA1C, a PY3, a VK4, ZLs 1BY 2AX 4IJ. *W7JJQ:* ZL2s MU UR. *WØEQW:* a ZL1 and ZL2AB. *WØBJP:* CX6EB. *LU4DZI:* Europeans CT1OR, EAs 4EF 7CJ 7DK, HB9AB, I1TKJ. *G2YZ:* Ws 2JY 3SJK and VE3AYS . . . . . W4ZAE is another who reports on ten's favorable DX trend. Mick nabbed HP3DA, ZL1HY and several South Americans . . . . . The preceding curt conspectus isn't to imply that 28 Mc. will be a ball of fire this summer; it never was much of a hot-weather band. But you may miss some DX fun if you don't have those rusty ten-meter rotaries de-cobwebbed by next fall!

Although not as sensitive a propagation barometer as ten, *fifteen* shows similar signs of better days to come. Most other paths holding marginal, there was a brisk upturn in Pacific-path DXcitement. VKs and ZLs hung on long after dark and profuse short-skip activity enlivened proceedings . . . . . W6ZZ picked up 'phones KH6s*AAI AFR AR, KZ5s ML RV, TI2TC, VK7s LZ WA, ZL1s BY and CH. An FO8 topped his field on c.w. . . . . W1YYM's 90-watt 'phone chalked up VK3TT, ZLs 1RF 2BN and 2LV between 1 and 2 *GCT* . . . . . W5VIR netted 'phones CEs 2CI 2HJ 3CZ 4BP 6AR, CP5AB, FO8AD, HC1MB, HR1JM, HP3DA, KG4AT, KV4AQ, OAs 4AQ 4AV 5M, PJ2s AI AO, PYs 2AEJ 3AGP 3QX

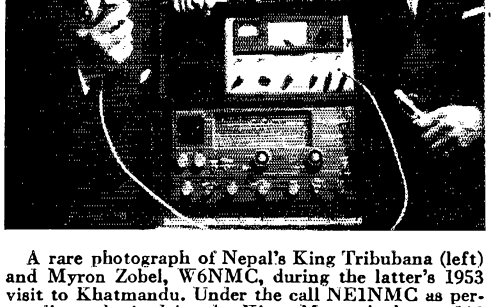


* DX Editor, *QST*.

[1] DeSoto, "How to Count Countries Worked," *QST*, Oct., 1935.

TI2s EA WR, VPs 1GG 5EM 5SC, YS1RA and a ZL2. C.w. successes on Sheldon's list include CE6AB, HK4DP, an FO8, KB6AY, KGs, 4AT 6AEX, KH6AGX/KG6, KX6BU, PJ2s AI AJ, VPs 3YG 6EB 7NM 9BF, YN1AA, YS1O and YV5FH .—.—.— Members of the Pacifico Radio Club — W6s HII KPM NJU NSV PFZ QHS and QXY — spent a week-end "DX field day" atop Mt. Pacifico and worked OA HP KP4 LU PY TI VP1 KH6 and FO8 on fifteen .—.—.— WNØQDG, who has worked several countries on 21 Mc., would like to see more DX stations on c.w. heeding Novices.

Twenty c.w., somewhat disdainful of its more unpredictable sister bands, maintains its monopoly on juicy Countries List material. W8EV reached 136 by way of FK8AL (88), FO8AC (71), HZ1HZ (68), I5LV (100), KB6AF (65), KM6AX (40), LU1ZL (77), LZ1KDP (75), MD5EU (15), OD5AV (40), SP9KAD (50), ST2NW (80), TA3AA (80), VP8AA (50), YOs 3RF (50), 5LC (75), 6VG (50), ZB1BU (68), ZC4IP (100), 4X4FF (40) and last but hardly least, VR3A (50) 2–6 *GCT*. Mid-evening VKs, à la 21 and 28 Mc., are a recent peculiarity Ben has observed on 20.—.—.— W9IHN returns to the fold with CR6AI (50), FF8AZ (35), FQ8s AF (55), AT (40), KT1UX (50), OQ5CP (70), VQ2AB (60) and ZE2JC (35). Chuck comments on the uncanny memory (or efficient card-index file) of ZL1BY. Bill always seems ready with nicknames and pertinent facts of past QSOs and it doesn't matter whether you worked him last month or two years ago. ZL1BY has *lots* of QSOs! .—.—.— HA7OL 8 *EST* and TF3MB 7–8 worked W4YZC between the latter's homework sessions .—.—.— EAs 6AW of the Balearics, 9DF (82) 13 *GCT*, LU7ZO and a VQ3 brought W9KXK to 118/112 .—.—.— W3EOB found ZC7DO (72) 23–24 *GCT* of Jordan a curious but welcomed addition .—.—.— EA9BF, FM7WP (39) 18 *GCT*, FY7YC (100) 21–22, a KB6, KR6AA, MP4BBK, VP4LZ and VS6CG will be QSLing K2GFQ (ex-W6JKH) to bring Paul to 128 .—.—.— W4PVD's Viking II, HQ-129X and hand-rotated 3-element beam presented him with EL2P (15) 13–19, FA8RJ 15, HA5KBP 11, KC6UZ 6, KX6AF 7, MF2IL 9, SVØWA 15, TA2EFA 13, a TF3 and VQ3, several YUs, 3V8AN (2) 7, 4X4FS 12 and a San Andrés Island HKØ, all times *CST* .—.—.— Resting up for a few weeks in the Bahamas, W4AIX took enough time out to bring Jeeves up to date on North Carolina DX doings at his home station: CR5AD (60), CT2BO, CX5CO (20), EA8s BC (30), BK, EL2X, ET2PA (30), GC4LI (70), KX6BF (70), OD5s AX (30), BH (22), OQ5s GU (60), LL VN (32), TFs 3AB 3WS 5SV, ST2AR, VP3YG (40), VQ4s RF BK (30), VS9s AS (40), KU (30), YI2AM (32), ZC4GF (32) and ZP5AY (70). "The VP7 gang are all very nice. Boy, do W3s BES GHD KT, W4FU, W9s AVJ and YFV boom in on 20 in VP7!" .—.—.— W9TGY broke the century mark with FKS8BC



A rare photograph of Nepal's King Tribubana (left) and Myron Zobel, W6NMC, during the latter's 1953 visit to Khatmandu. Under the call NE1NMC as personally authorized by the King, Myron had over 100 'phone contacts with 25 countries. W6NMC intersperses U. S. A. lecture tours among his world-wide travels and will complete an Hawaiian sojourn this November. (*Photo courtesy National Geographic Society*)

(81), Trieste IIs BNU YCV (78), JAs 3WS (89), 8AA (38), LU6ZE (12), OX3UD (40), ST2NW (72), ZB2A (27), 4X4FK (58) and 9S4AX (4), plus SVØ FO8 VR3 and ZP5 contacts .—.—.— An efficient 150 watts scored EA9AP (11) 20–21 *GCT*, MF2AG (70) 22–23, Qatar's MP4QAH (85) 14, SP3PK (40) 20–21, ZD6BX (20) 22, 4X4s FQ (10) 19–20 and HQ (10) 20 for W8YIN .—.—.— Worked or heard at W4ZAE: AC4NC (103 t4,) HE9LAA (48), KB6s AW (82), AY (54), KR6AB (21), LZ1KPZ (62), OQ5BM (57), SV1SP (48), UG6KAA (50–55), VP2AD (42), VQ4AE (64), VS6AE (25), 3A2AG (27), 4X4s FO (20) and LW (21) .—.—.— Miscellany collected hither and thither, by *K2CBM:* EA9EB, GC3EBK, VQ4EV. *W2CTO:* JA3BB and a 4X4. *W2ZGB:* KF3AB (35) 20–21 EST, VK9OK (60) 20–23 of Norfolk. *W6NTR:* said VK9, VR3A, AB1US (50) 5 GCT (see "Where" info). *W6ZZ:* JAs 1AR 6AO 7AD, KA2s KS ZZ, a KM6 and VR3A. *W7PHO:* one YA4DI. *W7UAB:* KA9MF. *W8PCS:* IS1CXF (50). 4X4FS (75). *W9AVJ:* HK9EV, ZK1AB (1). *ZD6BX:* TF5TP 20 *GCT*, VU2KV 15, VK1EG 17 of Antarctica (ex-VK1BS–VK2EG), ZC4JA 16, ZS7H 12 and 4S7LB 15 .—.—.— West Gulf DX Club's *DX Bulletin* notes 20-c.w. actives CPs 1AY (98) 2 *GCT*, 3CA (50) 21, CRs 6CZ (55) 13, 7AF (55) 12–13, DU7SV (80) 23, FO8AK (28) 3, FW8AB of Wallis, JZØKF (84) 14 of Dutch New Guinea, MP4BTF (30) in Oman, TG9AQ (103) 4, VKs 1AC (68) 2 of Macquarie, 3ADZ/Heard (100), 9AU (85) 13–14, 9RH (51) 3, 9WZ (60) 13, 9YY (95) 5–16, VP2GX (30–100) 21–24, VQs 4EG (26) 14, 5DZ (45) 22, VRs 2CG (95) 4–5, 4AE (10–11), VSs 1CZ (50) 17, 1FE (65) 14, 2BZ (47) 18, 2DF (48) 16, 2EB (108) 17, 6CT (62) 17, 6CW (87) 3, YK1AH (15) 12, ZD4BQ (30) 20, ZE3JP (50) 22, ZK1BI (110) 4, ZP6CR (8) 0, 4X4BN (70) 17 and 5A3TC (76) 2. Short-path A.M. Asians are once again in vogue.

On *twenty 'phone*, this same organ calls attention to CEØAC (105) 2 of Easter Isle, DU7SV (198) 16, EAØAC (110) 2, FF8AP (126) 0, FQ8AK (123) 21, Fletcher Ice Island's KF3AB (185) 22, KJ6FAA (223) 5, KR6CR (210) 8, ST2NW (150) 21, SVØWK (125) 13–14, TA3AA (109) 20, VK9OK (128–170) 5–7, VQ5CB (134) 21, VSs 1AY (115–181) 14–15, 1FB (128) 16, 1FK (161) 17, 1FP (201) 15, 2BB (182) 17, 2DB (118) 16, 2DV (141) 17, 2DY (148) 17, 2UW (160) 16, ZC1CM (320) 19–20, ZP5CF (162) 0 and 5A2TZ (322) 19, all times *GCT*. W5s really have a pipeline perking into Malayan areas! .—.—.— W2KJG put the hook to 'phones CN8s GL MM, KG4AO, TA2EFA, VPs 2GF 3LE, ZB2A and 5A3YG .—.—.— YV5AK caught up with KA2WL and KS4AV, while W5UUK was hauling in CS3AC (185) 2 of the Azores, and FM7WN .—.—.— ZS6FN nabbed CS3AB and Antarctica's VK1EG (150), and writes regarding the latter: "They have made arrangements to pass the log over the air and then VK4FJ will QSL for Bill Storer." .—.—.— Two nifties at W2WZ are HC8GI (300) 1 *GCT* and ZA1KAC (144) 16. Anybody have a QSL from that Albanian? .—.—.— AB1US (204) 8–13 worked W6NTR and many others; W9AVJ mentions the whopping signal of KA3RR at 3 *GCT* .—.—.— SWL Jack Reichert heard CR5SP, KX6AF (200) 9 *EST*, OQs 5EC 5FN 5LL ØDZ, VP8AQ, VQ4s AC and RF booming into Maryland .—.—.— F9UC/Corsica is a good 14-Mc. A3 proposition who is fast with a QSL.

The solar-cyclic DXodus toward higher frequencies may be just around the corner but don't write off *forty c.w.* too soon. Some time ago we inquired as to who could claim more 7-Mc. countries worked than W2RDK's 152. DL7AA took the cue. Rudi's logs show *155* ARRL Countries List items extirpated from the 40-meter substrata, 135 of these confirmed. DL7AA's all-band tally reads 222/212 — 86/80, 217/97, 91/80 and 104/92 on 3.5, 14, 21 and 28 Mc., respectively .—.—.— 3A2AW, who showed up in Monaco on schedule, made it 131 7-Mc. countries for W2DOD. Elmer also captured VQ2GW 21 *EST*, ZK1AB 6 and 4X4HQ 19 .—.—.— W2WZ worked KB6AY (30) 12 *GCT*, KG6AAY (21) 12, KX6BU (4) 11, TA3AA (20) 22 and YK1AC (13) 11 .—.—.— At W5UUK we find 7-megacyclers CN8FL, DU7SV, FA9RZ, FK8AO, JA8AI, KG6FAA, KH6AGX/KG6, KR6AA, a KX6 and VP2SH .—.—.— CR9AF, an FK8, JAs 1FA 1XR 3AA 3CB 6AA 6BC 7AB 7AO 8AE, KF3AB and VK6LU succumbed to the 813 and folded dipole of W6RZS .—.—.— Look what W5MCO accumulated while running *seven* watts on 40: DU7SV, JA1s CJ CR, KG4AT, KL7AW, a KX6, PJ2CE, TI2s PZ TG, VPs 7NM 9BF, XE1SA, a VK and a ZL2. GW3ZV presented W5MCO with a hard-earned 7-watt 7-Mc. WAC

. _ . _ . _ Some c.w. samples of 40-meter luck around the circuit, at *W1YYM:* VK9OK (42) 11 *GCT*, VR2AS (37) 11, both heard. *W3UUA:* EL2X 3 *GCT*, FA8DA 3, VP4LZ 3 and YU3AJK 0. *W8WPG:* worked CT2BO, I1BNU/Trieste, TI6EL, YU2ADE and others; heard EA6AF of the Balearics, HH2DL, MF2AA and PJ2AA. *W4YZC:* HK4DP (30), VS9AS (22), ZB2A (10) and 5A2FA (25). *W7UAB:* an FO8, KM6AX, VR2AS and a hefty helping of VK/ZLs. *W8EV:* HP1RX (4) and VP8AA (35). *W8YIN:* FK8AO (32) 13–14 *GCT* and VK9YY (20) 12. Ex-Novice *WØPWN:* PJ2AJ, YV5DE, numerous PYs and VKs . _ . _ . _ VR3A of Fanning continues rush business (6–25) 6–11 *GCT*, and the WGDXC boys are alerted for the 40-meter activity of OYs 1P 2A and 2Z . _ . _ . _ On *forty 'phone*, a kilowatt and half-wave vertical raised CM1AF, an FO8, HH3RC, HR1AA, KG4AT, KS4AV, VK4TN and YV5AB for W2VCZ. The *D X Bulletin* adds 7-Mc. A3 candidates HC4MK (210) 2 *GCT* and always popular VR3A (25) 11.

Eighty hangs on by its toenails. W3UOE telegraphed with EA9AP (20), FA9RZ (39), HH3RC (25), KH6MG (39), TI2TG (5) and YV5DE . _ . _ . _ W4YZC seconds the motion with a DL1, a GW5, FA8BG (40) and VK2HZ (20) . _ . _ . _ W1YYM chatted with G3HPM on 3.5 Mc., the G using a lofty 100-foot vertical.

What with deep-seated rumblings in the ionosphere causing higher-frequency ham bands to exhibit interesting propagational symptoms, a most moot DX question arises as to how *one-sixty* will perform during the '54–'55 winter Top Band season. Is the creaky door to close abruptly, causing 1.8-Mc. WAC possibilities to vanish for another eight or ten years? Or will the "return to normalcy" be less precipitous? With which provocative conjecture we now leave the megacycles for a glance at developments on the QSL front.

Where:

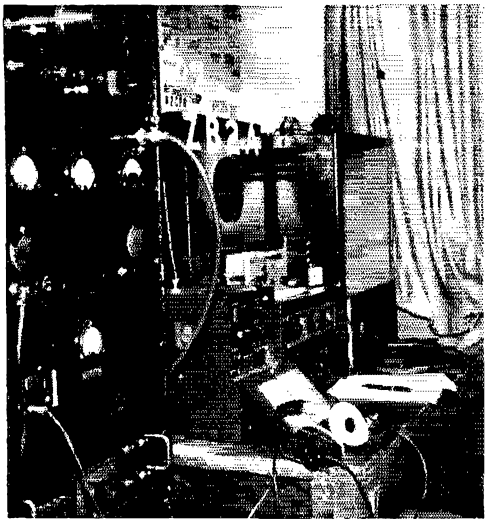
DXpedition stations operated on Colombian islands in the Caribbean under such calls as HKØs CV DE DP DT EH EV HQ IW and JH can be QSLd via LCRA (Colombia). Activity centered on San Andrés Island. Concerning HKØ DXCC country status, see "DXCC Notes," p. 73 . _ . _ . _ G2RO is on the go again — Oceanian and Asian British Empire calls ending in "RO" can be QSLd via G2RO and/or RSGB . _ . _ . _ Regarding the AB1US in the list to follow, amateur-band work under such call was not authorized by MARS. Under standing agreement, plus DXCC Rule 6, ARRL cannot honor AB1US QSLs for DXCC credit . _ . _ . _ CN2AP (ex-EK1CW-G2CIW), of the Tangier Radio Amateur Club, acts as QSL manager for the Zone and writes: "In the past Tangier seems to have acquired a bad name for non-QSLing but if any instances occur in the future [our] committee will be only too glad to investigate such cases." . _ . _ . _ G3HLS has undertaken to clear up some SVØWP/Crete QSL difficulties as best he can. Arthur first accepted responsibility only for British QSLs and has had to enlarge his effort more or less in self-defense. Once more let us opine that DXers who take time out from their own operation and bookkeeping to assist in the dissemination of another station's QSLs deserve our praise and full coöperation . _ . _ . _ VK1RL assures W2QHH that he's busily catching up on his QSL obligations . _ . _ . _ From MF2AA: "All [Trieste-bound] cards should be forwarded to our QSL bureau, P. O. Box 301, Trieste, F.T.T., and *not* as in the past to ARAT president MF2AA." . _ . _ . _ Addresses in the catalogue to follow do not necessarily indicate the geographical locations of stations concerned. These items with thanks to W1s JOJ TSZ UED WPO YYM ZDP, W2s CJX WZ, W4s PVD YZC. W6NTR, W8s RLT YIN, W9s CFT KXK TGY, KL7AWB, LA6QB and the WGDXC *DX Bulletin:*

AB1US, APO 63, % Postmaster, San Francisco, Calif. _ . _ . _ CX5CO, Yamandu Luzardo, 26 de Marzo 1331, Ap. 6, Montevideo, Uruguay _ . _ . _ DLØBS, (QSL via DARC) _ . _ . _ EL2P, (QSL via W1JOJ) _ . _ . _ EL2X, (QSL via W1JOJ) _ . _ . _ EL7A, Wes Young, Firestone Plantations, Harbel, Liberia _ . _ . _ ET2XX, Lt. Col. C. S. Breeding, 9434th TSU, Mess D, APO 843, % Postmaster, New York, N. Y. _ . _ . _ FG7XA, (QSL via W4LVV) _ . _ . _ HKØEV, (QSL to HK5EV or via LCRA) _ . _ . _ KA2DX, Lt. Col. Fred J. Elser (W4GVU), NSF Signal School, APO 38, % Postmaster, San Francisco, Calif. _ . _ . _ ex-KG4AT, CPO Vernon H. Hardy, VC-12, NAS, Quonset Point, R. I. _ . _ . _ KH6AUJ, Dotty James, 6172 May Way, Honolulu, T. H. _ . _ . _ ex-KJ6AY, Bill Slep, KA2AK, 1503rd Operations, APO 226, % Postmaster, San Francisco, Calif. _ . _ . _ ex-KR6HN, (QSL to WØAAY) _ . _ . _ LA7UE, (QSL via NRRL) _ . _ . _ MP4QAH, (QSL via RSGB) _ . _ . _ ex-OA4DX, (QSL to W5BR) _ . _ . _ ex-OX3BI, (QSL to K2ECY) _ . _ . _ SVØWM, M/Sgt. M. L. Carmichael, 1950–1 AACS Det., APO 206, % Postmaster, New York, N. Y. _ . _ . _ VK9AU, % RTC, Lae, Ter. of New Guinea _ . _ . _ ex-VK9BI, (QSL to VK3AGW) _ . _ . _ VK9OK, (QSL to ZL1AJU) _ . _ . _ VP7SL, Sam Long, Communications, Albert Whitted Airport, St. Petersburg, Fla. _ . _ . _ VQ3ES, E. Bert Gerryts, Shinyanga District, P. O. Mwadui, Tanganyika _ . _ . _ ZC5SF, G. Harrison, Harbor Master, Sandakan, British No. Borneo _ . _ . _ ZC7DO, Box 01, APO M.E.L.F. 12, GPO, London, England _ . _ . _ ZD6BS, (QSL via RSGB) _ . _ . _ ZD6BX, Victor H. Thorne, Blantyre Airport, P. O. Chileka, Nyasaland _ . _ . _ ZK1BI, R. Lowry, Rarotonga, Cook Islands _ . _ . _ ex-ZM6AF, (QSL to ZL1AGR) _ . _ . _ ZS6FN, P. O. Box 7243, Johannesburg, Union of So. Africa.

The Portuguese islands of Azores heretofore have been represented on our DX bands almost solely by CT2BO (c.w.) and CS3AC (mostly 'phone). And they've done an outstanding job. One more increasingly active Azorean is Norberto dos Santos, CT2AG, as photographed above with his station. CT2AG prefers 'phone work, appears regularly on 14 Mc., runs parallel 807s at 50 watts input with Class AB_2 807s modulating, uses an NC-125 receiver and radiates with a folded dipole. Address QSLs for CT2AG to Norberto at Aeroporto de Santa Maria, Azores, Portugal.

Whence:

Asia — Recent Palestine availability principally has been through courtesy of W5LLQ at the key of ZC6UNJ. Bill now returns to Washington for reassignment and can be reached by mail via this address: Lt. Col. W. T. McAninch, % Mr. Noel Runyan, Box 585, R.D. 1, Mingo Junction, Ohio. "As of May 17th, unless some of the commercial ops with UNTSO operate ZC6UNJ, the station will be off the air," avers Bill. He'll be on with a new W3 call soon . _ . _ . _ W8YIN has MP4QAH's Qatar layout as 30 watts and an on-the-nose ground-plane vertical . _ . _ . _ TA3MP, fairly inactive of late, has shipped his gear Statesward and should shortly be heard from W2JQU. Meade writes that TA3US has been reactivated under a qualified operator and should pitch in to help TA3AA carry the W/VE burden. Incidentally, TA3MP QSLs were held up by a delayed print



Most active of the only two Gibraltar stations on the air, ZB2A provides rare Rock QSOs and QSLs for a multitude of DXers on several bands, 'phone and c.w. G3s DBT and GFM do much of the operating at present and the station is most active between 1700 and 1900 GCT with 150 watts to an 813. (*Photo via W6GPB*)

order. He'll QSL 100 per cent in due time and has a list of 900 QSOs to work on . . . . W4GVU adds KA2DX to his lengthy list of calls held and now knocks 'em dead on 20 with a BC-610, Super-Pro and 3-el. beam. Fred has s.s.b. available . . . . Speaking of s.s.b., W6FCS maintains heavy traffic skeds via this medium with KA4MA of Itami, Japan, on 14 Mc. . . . . The Japan Radio DX Club of Tokyo offers a "WJDXRC" certificate to any station submitting QSLs for contacts with five of its members. Write JA1BK at the JDXRC QTH, Box 7, Tokyo, for further details and a membership roster. JA1AA is listed in the JDXRC organ as top Japanese-national DXer with 126 countries worked and 91 confirmed. He has 60 countries accounted for on 40 . . . . . WØERC still hacks away at ham-prohibitory red tape in Afghanistan. "The way it looks now, official permission may not come for a long time. Even the U. N. Mission, which has a network in all countries except here, has been trying unsuccessfully for two years to get licenses." (Don't pass up YA1AB, however.) . . . . From W2GT: ZC7DO is ex-MD5DO.

Africa — A missive from ZD6BX (ex-VS1BX): "I'm running 100 watts on 20 meters to a long wire. After three weeks of operation my countries-worked list stands at 53, so maybe I'll make 200 yet. . . . W sigs are very few and far between and only W4GD and W8YIN have been worked to date. Europeans are audible most of the day. Hope to have a spell of 40 c.w. very soon and see how the W sigs come through on that band." Patience, fellows; ZD6BX plans a very radio-active 5-year stay in Nyasaland . . . . W2WZ learns that ET2XX is ex-W6HHR-KR6CS-W7MJT. Al is one of those rare lads who have QSLs from EA9DC . . . . You may remember OQ5GU as former ON4DB . . . . Ed Collins of *QST*'s advertising department contributes interesting excerpts from a letter of Captain Kurt Carlsen, W2ZXM/MM. Kurt's *Flying Enterprise II* ham-shack was visited by a delegation of some 60 CN8 hams during a recent docking. W2ZXM/MM then was given a lively reception at a swank Casablanca hotel where the group swelled past 70. There Kurt was assigned the temporary calls KZ5HC/CN8 and W2ZXM/CN8, with a *permanent* CN8 call to follow. "Captain Stay-Put" mentioned an F8 sea captain whom he has heard operating maritime-mobile on 20 meters . . . . New officers of the Tangier Radio Amateur Club are CN2AO, president, and CN2AR, vice-president. The organization is now recognized officially by the Tangier administration and CN2AP writes: "At the present time we still have no actual licenses but are authorized by the administration to operate. They are working on a new law entirely for radio amateurs. The EK1 prefix, as you no doubt know, is now extinct and so far calls have been issued only in the CN2AA-CN2BZ series." . . . . ZS1MP writes friend W1RDV anent his return to Canada after three years of African-style hamming. ZS1MP is a geophysicist by profession and hopes to settle in the U.S.A. at an early date. He confirmed 75 countries out of 105 contacted, worked all of the U.S.A. but Utah, and his statistics reveal a mere 40 per cent return on QSLs . . . . FB8BK intends to put Tromelin Island, 260 miles northeast of Madagascar, on the ham bands.

Oceania — W8RLT, via W1s DAV and RMS, reports on Sarawak and British North Borneo June activity as scheduled by G2RO under the calls VS4RO and ZC5RO, respectively. Bob's favorite frequency is 14,060 kc., and usual operating period, around 1400 GCT, primarily using c.w. Watch for further "RO" activity from other Oceanian and Asian locations throughout the summer . . . . W6NTR finds that the new long-wire of VR3A really does a job in the pile-ups. Jack is among those who collided with one X1NP, supposedly a ship in waters off Queensland, and adds word that VK9YY seeks an okay for some near-future JZØ hamming . . . . W1YYM finds that ZL3KN has 97 countries worked on the 7-Mc. band and is nearing completion of separate WASs on 40 and 80. ZL1CI, DXtraordinarily active for 25 years, boasts an 80-meter WAC . . . . After tedious delays, Chas. H. Freeman, VE7ASL (ex-VR2CD-ZL4FH-ZL3AE-ZL1BI), in August will take off on a mobile tour of the 48 U.S. lasting three months or more. At the completion of this roaming Chas. will fire up in Hawaii as VE7ASL/KH6 and he looks forward to a subsequent KH6 label. In particular, ex-VR2CD would like to be on hand at forthcoming hamfests and conventions along his route and will endeavor to arrange his itinerary accordingly. He can be reached by mail at his *Call Book* QTH . . . . KR6HN is closing his books for return to WØAAY. Cole writes, "I have a 100 per cent QSL policy but in case anyone has not received a card he should write, giving full particulars, and I will be glad to send another one. . . . This last month has shown very greatly improved conditions on both 40 and 20. Okinawa amateurs have been authorized 3500 to 3575 kc., A1." . . . . ZL2GX knows of no YJ, VR5 or VR6 activity at the present time.

Europe — LZ1DP lists LZ1s AA DP KAB KCA KNB KPR KPZ KSA KSI, LZ2s KAC and KSK as legitimate Bulgarian call signs. LZ1s KCA and KPR stick to 28 and 3.5 Mc., respectively. LZ1DP likes to be active daily between 0400 and 2200 GCT, 14,020 kc. preferred. He adds that LZ1KWS was somebody being funny, or else a miscopied "KAB." . . . . MF2AA of ARAT (Trieste) advises that a new certificate award is available that should be of interest to DXers. Among the requirements is the working of six Trieste IIs, two AG2s and two MF2s, each station to be worked on two bands. Tough enough? Write ARAT, P. O. Box 301, U. S.-British Zone, Trieste, F.T.T., for the entire set of stipulations . . . . We hear that W2WZ becomes the second U. S. amateur to qualify for the USKA (Switzerland) Helvetia-22 diploma award . . . . DL7AA (ex-D4AFF-D4GWF-D4CAF-D4JPC-D4CP) of the DARC (West Germany) will supply requesting amateurs with full details and convenient forms pertinent to the WAE award . . . . 3A2AH tips us off on the formation of ARM — Association Radio amateurs Monegasques — a new Monaco society with intentions of applying for IARU affiliation. Of the 500-acre municipality's 20,000 inhabitants only 2250 are native Monegasques . . . . WØLZL, stationed in Iceland, finds the TF ban on U. S.-citizen hamming frustrating to say the least. Gene has s.s.b. inclinations . . . . Another Greece entry, SVØWM, intends early activity on 20 and 40, 'phone and c.w. Marvin also looks forward to giving s.s.b. a whirl . . . . July 10th and 11th will see an "International Ham Meeting" taking place in Munich under DARC auspices. An historical display of ham memorabilia spanning 30 years, hidden-transmitter quests, b.c.-station tours and "quiz programs" are to be featured. DLØBS will be in operation at the site on several amateur bands and will confirm all contacts with special QSLs . . . . Bjrønøya Island, in the Antarctic Ocean about midway between Spitzbergen and the Norwegian town of Tromsø, will be represented soon on DX frequencies by LA7UE. Operator Alv is wirelessman for the island's met station. This via NRRL secretary LA6QB . . . . SVØWO is reported active on Crete, with possible SVØWK/Crete activity to follow.

(*Continued on page 134*)

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

Well, it was a good try!

The first attempt at a transcontinental 2-meter relay, May 22nd and 23rd, didn't quite make it, but significant progress was made toward the goal. A new record for long-distance relaying on 144 Mc. resulted, and a message was pushed over the Rockies on 144 Mc. for the first time. Indications are that a second attempt, scheduled for the long holiday week end, May 29th to 31st, has a good chance of success. Results of this try will be reported separately in this issue if a 2-meter transcon comes off at that time.

There is nothing very new about the idea of a transcontinental relay on 144 Mc., of course. It has been talked about for years, but something more than talk is required if such a feat is to be accomplished. Coördinated effort especially is needed in the far West. This was supplied through the coöperation of W6IHK and the Two Meters and Down Club of Los Angeles, and members of the Albuquerque V.H.F. Club. Too late for publication in *QST*, we received details of their plans, so an ARRL Bulletin was sent over W1AW and all OBS stations to alert as many 2-meter men as possible for the May 22nd and 23rd attempt. These and the several mimeographed mailings by W6IHK to more than 150 v.h.f. operators in all call areas and three Canadian Provinces assured a good turnout.

A complete transcon was missed by only a narrow margin, and but for very bad weather in New Mexico and Western Texas, it is quite likely that the first try would have been crowned with success. As it was, a message originated by your conductor got as far as Amarillo, a new record for v.h.f. relaying. The eastbound message from W6EMM/6, Manhattan Beach, Calif., also reached Amarillo, but too late to catch operators east of that point. Routes were as follows:

Message No. 1 from W6EMM/6 addressed to W1HDQ started on its way at 1000 PST, traveling via W6EJL and W6WGT to W6WSQ/6 on Tiptop Mountain. From there it was passed on c.w. to W7JU, Boulder City, Nev., who relayed it to W7LEE, Parker, Ariz., where it encountered its first delay on the eastward route. However, another station, as yet unidentified, copied the transmission from W7JU and was able later to get it to W7FGG, Tucson, and the relay was on again.

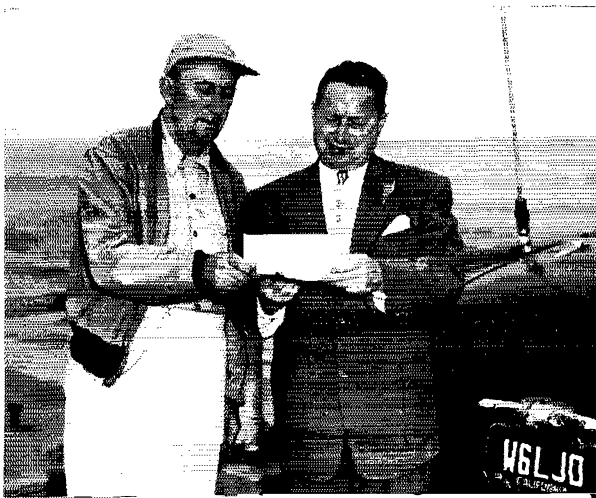
Next stop was W6ZW/7 on 10,700-foot Mt. Graham, near Safford, Ariz., who handled the relay to W5FAG/5 on Mt. Withington, 15 miles southwest of Socorro, New Mexico. W5CA/5, Capillo Peak, near Mountainaire, and W5VWU/5, Sandia Crest, near Albuquerque, then had the burden of bridging the gap to Western Texas, and it very nearly proved too much for them. The message arrived at its last stop in New Mexico at 1700 MST, but bad weather interfered with attempted relays to Amarillo until too late for W5SFW and W5MJD of that city to get it off further to the east. W5ZU, also out for the relay attempt, reports that sleet, snow and high winds were the order of the day on the mountain tops.

A check between Sandia Crest and Amarillo some weeks before had shown that the 270-mile path could be worked quite readily, but such was not the case at the crucial moment, so Amarillo was the eastern end of the first west-east attempt. The same city was also the terminal point for the east-west message, as it happened.

Message No. 1 from W1HDQ, addressed to W6EMM/6, left Canton, Conn., at 0625 EST, May 22nd, going to W2UK, New Brunswick, N. J. Routing from there is believed to have been via W8WXV, Shiloh, Ohio, W9WOK, Bensenville, Ill., W4HHK, Collierville, Tenn., W5UZW/5, Shreveport, La., W5CVW, Ft. Worth, W5AJG,

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

♦



Transcontinental relay on 144 Mc. gets under way from the pier at Manhattan Beach, Calif., May 29th. Mayor Charles Perry Walker hands message for Mayor DeLucco of Hartford, Conn., to Horace Bodine, W6LJO, who operated W6EMM/6 for the 2 Meter and Down Club of Los Angeles, western terminal station of the coast-to-coast v.h.f. relay system. (*Photo by W6ESR*)

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Second 2-Meter Transcon Attempt Succeeds!

Dreams of a generation of v.h.f. men came true over the week end of May 29th–31st when messages crossed the continent in both directions on 144 Mc. Message copy below tells the story:

NR 2 CK 8 CANTON CONN 0622 EST MAY 29 1954

TO FIRST WEST COAST STATION TO RECEIVE THIS MESSAGE

PLEASE NOTIFY ARRL BY COLLECT WIRE UPON RECEIPT

TILTON W1HDQ

LOS ANGELES COLLECT

RECEIVED YOUR RADIOGRAM NUMBER TWO 1956 HOURS PDT VIA TWO METER TRANSCON

W6LJO

NR 2 MANHATTAN BEACH CALIF 1010 PST MAY 29 1954

TO W1HDQ WEST HARTFORD CONN

HELLO EAST COAST GANG STOP THIS FIRST TWO METER AND DOWN TRANSCONTINENTAL RELAY WILL MAKE VHF AMATEUR RADIO HISTORY

2 METER AND DOWN CLUB

W6IHK

(Received from W2UK 1145 EST May 30)

Many other messages were handled over the coast-to-coast system. Routing and details next month. Congratulations to all hands!

Dallas, Texas, W5SCX, Ardmore, Okla., W5HXK, Watonga, W5HGH, Buffalo, and W5MJD and W5SFW, Amarillo, Texas. The message was copied at 2130 MST by W5MJD, having traveled a direct-line distance of more than 1600 miles and a point-to-point distance of some 2350 miles.

For a first try, most relaying points were working very well. It was reported back to your conductor that our message reached Ft. Worth at about 11 A.M. Messages were received here from Midwest Division Vice-Director, WØMVG, Salina, WØZJB, Wichita, Kansas, and W5CVW, Ft. Worth, in good relaying time. With some practice we should do much better.

This practice can be a good thing for all of us, and for 2-meter activity. Conceivably, it could attract to v.h.f. some of that considerable body of hams who have not previously been drawn by our blandishments, the traffic men. And by giving the rest of us a nodding acquaintance with the elements of message handling, it can help us to be better prepared for emergency work, should the need arise. Let's keep trying, at regular intervals.

To be of greatest value to 2-meter activity in general, several routes should be organized with alternate stations for as many points as possible. Individual hops should be kept short, to prevent failures under adverse conditions and to provide work for willing hands. A relay attempt might well be planned around an expedition scheduled by W6RLB, W6VSV and WØISL. Between 1600 and 1900 MST, July 26th to August 1st, W6RLB and WØISL will be operating from Pikes Peak, Colorado. Power will be 200 watts, c.w., on 144.09 Mc. W6VSV will be on 14,262-foot White Mountain, near Bishop, Calif., on 144.97 Mc. Liaison frequencies of 3791 and 7040 kc. will be used during the tests. Schedules will be arranged with interested parties, with a view to working unusual DX in any direction.

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

So far, the spring of 1954 has turned out to be the best for sporadic-*E* DX on 50 Mc. of any season in several years. It's anyone's guess as to why this should be so, with sunspot numbers and conditions on lower frequencies running at just about the ultimate low. Perhaps the clue lies in the report that the first spots of the next 11-year cycle have been seen in the high solar latitudes. This year's auroral activity is also up over recent years, so perhaps we've hit bottom and bounced part way back up again.

Activity on 50 Mc. could use some incentives. On many recent evenings, all the signs have pointed to the band being well open. Signals on the mobile frequencies adjacent to the low end of the band have been heard from far and wide, and DX has been rampant on the TV channels, but no more than a handful of 6-meter DX signals have been heard at any one time. Let's get going, gang; the 6-meter band is too interesting territory to be enjoying so little use!

If it's fear of TVI that's been bothering you, check on those articles by W2IDZ. In the last issue of *QST*, and in this one, Ed shows us that TVI is no insurmountable problem even in Channel 2 areas. In localities where there is no Channel 2 use, 50 Mc. is one of the best bands we have from the TVI standpoint. And it's fun, too. Ask any fellow who hangs out there regularly. Equipment? There'll be some fine new gear for 6 in the next few issues of *QST*. If you haven't been on 6 yet, you're missing something. Better look into it right now.

There is no lack of activity on 50 Mc. in Japan, according to JA1AN, who handles v.h.f. news for the Japanese ham magazine. He writes that well over 100 stations are heard regularly on 6. Equipment runs all the way from simple low-powered rigs and super-regenerative receivers to high power and crystal-controlled converters. Antennas are mostly 3- or 4-element Yagis, though several stations are using stacked arrays. Routine operation is carried on over distances of 120 miles or more, and there has even been some sporadic-*E* work, between JA1CF and JA6BV, a distance of some 550 miles.

The JARL is sponsoring a v.h.f. contest the week ends of July 24th and 31st, featuring the 50-Mc. band the first week end and the 144-Mc. band the second.

Closer to home, W3LFC, Swarthmore, Pa., reports that 6 was open for 6 nights in a row, beginning May 11th, but too few signals were heard. The beacons of W5AJG and W4FBL were reported by many operators in the Northeast, but no stations were worked in either Jacksonville or Dallas from up in this direction. Walter says that activity around Philadelphia and Washington is quite good, and your conductor can vouch for the fact that a considerable number of W1s and W2s can still be rounded up on 6, but we need more stations in the South and Midwest.

New states have not been added easily so far this season, but VE3AET managed a couple. Reg added W7VS in Oregon and W5LFH, New Mexico, to bring his total up to 43. He is now the top Canadian in our 50-Mc. WAS listings.

Eastern 2-meter stations report conditions generally poor during most of May, the result of the unstable and generally cool weather. The Pacific Northwest, however, experienced some good tropospheric openings. VE7ALL, Comox, B.C., says that Seattle stations, nearly 200 miles to the south, came in well the night of May 17th. Fred worked W7s PAE PZO RAP and FKL, as well as VE7s DH VY JG GR and LT.

One part of the country where very favorable conditions for long-distance tropospheric propagation develop fre-

quently is along the Gulf Coast. Analysis of TV DX reports collected over the past several years shows definitely that average ranges covered by TV stations in both the high and low bands is greater for those in Cuba, Florida, Alabama, Louisiana and Texas than for any other section of the United States. (Observers in Mississippi and Southern Georgia do well, too, but the reports are based on TV stations in the first-named group.) Daily reception over distances in excess of 200 miles is not unusual, and 600- to 800-mile hops occur fairly often. Two-meter signals have crossed the Gulf a few times, but TV evidence indicates that it would be quite a common occurrence if it was tried regularly, with good equipment and antennas.

Florida is particularly well situated for 2-meter DX, yet contacts with that state have been made by only a handful of 2-meter operators beyond its borders. W4HHK, among others, would like skeds with Florida stations. WGUL, Channel 11, in Galveston, is reported fairly often as far away as Tampa and St. Petersburg. Certainly the 144- and 220-Mc. bands are open for like distances at these times.

Generally poor tropospheric conditions during May made for little excitement in 220- and 420-Mc. circles, but things were happening on these bands just the same. There was much testing of gear in preparation for the June V.H.F. Party, and more stations are ready to go than ever before. Example: W9OVL, Hammond, Ind., says that recent arrivals on 220 include W9s DNA IBZ AFP ZGU VVH JYR OTV WPA GRA WRP and PZD. And W3SJB, Scottdale, in Southwestern Pennsylvania, wants it known that he is looking for 220-Mc. contacts in Ohio and points west nightly between 2100 and 2300. He is on 220.6 Mc., calling on the hour and half hour.

2-Meter Standings

Call	States	Areas	Miles
W1HDQ	18	6	850
W1RFU	17	7	1150
W1IZY	16	6	750
W1MNF	14	5	600
W1BCN	14	5	580
W1DJK	13	5	520
W1KCS	13	5	465
W1MMN	10	5	520
W2UK	23	7	1075
W2NLY	22	7	1050
W2ORI	21	8	1000
W2AZL	20	7	1050
W2QED	19	7	1020
W2PAU	16	6	740
W2DFV	15	5	—
W2AMJ	14	5	550
W2BLV	14	5	700
W2AOC	14	5	450
W2QNZ	14	5	400
W2UTH	13	7	880
W2SFK	13	6	—
W2CET	13	5	405
W3QKI	22	8	820
W3RUE	22	8	760
W3NKM	19	7	660
W3KWL	16	7	720
W3LNA	16	7	720
W3FPH	16	7	—
W3GKP	15	6	800
W3IBH	15	5	570
W4HHK	23	7	850
W4AO	21	7	950
W4JFV	18	7	830
W4MKJ	16	7	665
W4OXC	14	7	500
W4JHC	14	5	720
W4TCR	14	5	720
W4IKZ	13	5	720
W4JFU	13	5	720
W4UMF	13	5	600
W4ZBU	10	5	800
W4UDQ	9	4	850
W4WCB	9	4	650
W4TLA	7	4	850
W5RCI	20	7	925
W5JTI	14	5	670
W5QNL	10	5	1400
W5CVW	10	5	1180
W5AJG	10	4	1260
W5MWW	9	4	570
W5ML	9	3	700
W5ABN	9	3	780
W5ERD	8	3	570
W5VX	7	4	—
W5VY	7	3	1200
W5FEK	7	2	580
W5ONS	7	2	950
W6ZL	3	3	1400
W6PJA	3	3	1390
W6WSQ	3	3	1390
W6BAZ	3	2	320
W6NLZ	3	2	247
W6MMU	2	2	240
W6GCG	2	2	210
W6QAC	2	2	200
W6EXH	2	2	193
W7JU	3	2	247
W7LEE	3	2	240
W7YZU	3	2	240
W7JUO	2	2	140
W7RAP	2	1	165
W8BFQ	24	8	775
W8WJC	24	8	775
W8WXV	22	8	1200
W8WRN	20	8	670
W8DX	20	7	675
W8BAX	19	7	655
W8EP	18	7	800
W8UKS	18	7	720
W8RMH	18	7	690
W8RWW	17	7	630
W8WSE	16	7	830
W9EHX	23	7	725
W9FVJ	22	8	850
W9EQC	21	8	820
W9BPV	20	7	1000
W9UCH	20	7	750
W9LF	19	—	—
W9ALU	17	7	800
W9WOK	17	6	600
W9ZHL	17	6	—
W9MBI	16	7	660
W9KLR	16	7	—
W9BOV	15	6	—
W9LEE	14	6	780
W9DDG	14	6	700
W9FAN	13	—	680
W9UIA	12	7	540
W9GTA	11	5	540
W9JBF	10	5	760
W9DSP	10	4	700
WØEMS	24	8	1175
WØGUD	22	7	1065
WØIHD	19	7	725
WØONQ	17	6	1090
WØINI	14	6	830
WØZJB	12	7	1097
WØOAC	12	5	725
WØWGZ	11	5	760
VE3AIB	20	8	890
VE3DIR	17	7	790
VE3BQN	14	7	790
VE3BPB	12	6	715
VE3AQG	11	7	800
VE1QY	11	4	900
VE3DER	10	6	800
VE2AOK	10	5	550

V.H.F. Club Activities

The radio club is one of the best mediums for the promotion of v.h.f. interest. Quite a few clubs now devote all their time to v.h.f., while others sponsor v.h.f. activities at intervals. One of the most popular summer activities is the v.h.f. picnic, an outdoor affair where hams from miles around congregate to discuss their common interest. Two such have come to be standard summer events on the v.h.f. man's schedule.

One is the Turkey Run V.H.F. Picnic, held each year in Indiana's Turkey Run State Park, just north of Terre Haute, under the sponsorship of the Wabash Valley Amateur Radio Association. This year's event will be held Sunday, July 25th. Charles Hoffman, W9ZHL, Box 196, North Terre Haute, Ind., is chairman of the picnic committee, as usual. Your conductor made it last year, and can vouch for it as a not-to-be-missed affair.

The Two Meters and Down Club of Los Angeles holds its annual V.H.F. Round-up and Picnic August 22nd, at Buena Park. V.h.f. men around the Los Angeles area don't need to be sold on this one.

W2QPQ, secretary of the U.H.F. Club of Jamaica, knows better than to miss a meeting again. Last time he stayed away he inherited a new job. Julian was elected unanimously to compile a directory of all stations in the New York area who are working on 220 and 420 Mc. Anyone using these bands in the five boroughs, plus Nassau, Suffolk and Westchester counties, is asked to send a postcard to Julian Jablin, W2QPQ, 147-14 Charter Road, Jamaica 35, N. Y. Please give your call, location, operating frequencies and schedules, if any. Every operator sending such information will receive a copy of the directory.

Is your club carrying on v.h.f. programs that could be aided by publicity in *QST*? If so, let us have the information and we'll run it in these pages. Such material should be in the writer's hands by the 20th of the month to make the issue of *QST* that is mailed about 5 weeks later.

OES Notes

W3OTC, Silver Spring, Md.: 50-Mc. openings in middle of May excellent, but too few stations on to many things really interesting. Commercial sigs below the band in for hours nightly, and VE1s and W4s heard almost simultaneously. Skip very short May 13th, with W1VNH and W1HDQ heard momentarily. This is unusual for May, indicating that 1954 season is running much better than recent years. W5AJG beacon heard S9-plus 1915 to 2015 EST on the 15th, but no other sigs coming through. What's happened to 50 Mc. in Texas?

W3UQJ, York, Pa.: Nightly sked on 435.7 Mc. with W3SST in Dover. W3SST was heard recently by W2QED, 125 miles, yet he runs only 4 watts output, and his antenna is 8 half waves in phase without reflectors. Antenna elements are No. 12 wire. W3UQJ also keeping 2100 to 2300 sked on 435.7 Mc., aiming northeast, Monday, Wednesday and Friday nights. Philadelphia and points north and northeast please note. Also working on 10-cm. gear with W3VDV.

W4HHK, Collierville, Tenn.: Meteor-scatter tests on 144 Mc. continue daily with W2UK; less often with W2NLY and W2AZL. April record shows 94 separate skeds, of which all but 15 showed some sign of signals over this 940-mile path. Burst counts for 5-minute test periods run from 1 to 34. Checks with W2UK consist of two 5-minute periods, one with beams heading toward each other, the other with them aimed 10 or 20 degrees north of the direct line. Some two hours of recordings made on this circuit have been supplied to your conductor, who has been using them with good effect in radio club talks. At the recent IRE-URSI sessions in Washington, D. C., the writer had the opportunity of playing them for a group of distinguished propagation physicists. Interest in the work performed by W4HHK and the W2s was high, and all agreed that an outstanding job was being done by these v.h.f. enthusiasts. If there is sufficient interest, a sample tape, containing excerpts from recordings made by W4HHK and W2UK, with explanatory commentary by the writer, will be made available for use by ARRL-affiliated radio clubs for their meetings.

W5NSJ, Albuquerque, N. Mex.: 6AN4 amplifier for 420 built according to March *QST* article by W5AYU and W5HPJ, except that 0.032-inch sheet brass was used for housing. Results excellent, with no sign of regeneration.

(*Continued on page 132*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
R. L. WHITE, W1WPO, Asst. Comm. Mgr., C.W.
PHIL SIMMONS, W1ZDP, Communications Asst.

GEORGE HART, W1NJM, Natl. Emerg. Coördinator
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, W1ZJE, Administrative Aide

Time to Go Mobile. A lot of mobiles will have been tried out incidentally in connection with this year's FD, recent history as you read these lines. As a result of a recent survey it appears that more than one of every three active amateurs can now engage in mobile as well as fixed station operation. This will probably be the biggest summer yet for vacation use of mobiles, so don't let yours gather dust just because the Field Day is past history.

True emergency readiness takes more than a one-day test, valuable though this is. There is no better way than daily or weekly use to keep the "set with handles" or the car-installed rig so that you know it will be with you when the chips are down. Gas-driven power supplies used on the Field Day ought to be given a run at least once or twice a month throughout the year to make sure they are always ready to go, gaskets in good shape and so on.

For those making trips it is important to note that Section 12.91 of our FCC Rules requires that whenever mobile or portable work is likely to be for an over-all period of over 48 hours away from the fixed transmitter location, the licensee shall give prior written notice to the Engineer-in-Charge of the radio inspection district in which such operation is intended. Page 6 of the *License Manual* has the complete list of the 21 U. S. radio districts, with addresses and areas identified to assist you when sending such notices.

How to Use 73. The easiest way for new operators to get started right is to learn the correct use of amateur abbreviations in the first place, suggests W1ONV. For example, "73" is *all* that's needed to send your best regards. The only modification of it that sounds and is right is "very 73" for very best regards. On 'phone, say it with words, "best regards." But if you prefer the abbreviation for your voice work say "73," *never* "73s," which is a tip-off that someone hasn't picked up one of the fine points observed by the experienced operator who knows his usages. The use of a single and proper ending signal is likewise important. A message to Hq. asking for Operating Aid No. 2 will bring you the convenient List of Ending Signals.

Honorable Mention to Observers. More than 500 Observer appointees assist in sending friendly coöperative-type card notices to amateurs whose signals appear to be in need of owner observation or adjustment to avoid FCC citations and other difficulties. Most of this commendable work falls on the shoulders of 20 per cent of the group. SCMs are called upon currently to review the case histories of observers *not* reporting activity on the forms provided, this so that newly interested members may have assisting information and fill the vacancies. All appointments depend on activity and fulfillment of the functions "of, by and for" amateur radio. Special commendation is due the '53 leaders in observing efforts and these are here listed by licensing areas:

W1TVZ	W2QQ	W3AEV	W4KL	W5QNK
W6CK	W7FIX	W8GZ	W9LEE	W0CXE

General amateur appreciation continued to be given the Observer service. Frequency observance at band edges is generally better than it used to be but many notices were sent relating to harmonics and accidental work between bands. Data on the responsibilities and forms used will be sent to members on request.

Operating Time, Power Levels and S.S.B. Increase. Did you ever wonder how a comparison of the power levels and operating time of the DX Man, Trafficker, Rag Chewer and Experimenter compare? A survey not exactly current was taken some years ago and the following from the Communications Manager's '46 Annual Report to the Board of Directors probably is not too far out of the way:

Interest	*Av. Power Input*	*Hours per Week*
DX	500 watts (approx.)	31.5
Traffic	375 watts	50.5
Rag Chewer	153 watts	17.7
Experimenter	138 watts	14

These operators were self-classified in a survey of some 13,000 returns as having an exclusive interest in these types of amateur work. There is little reason to believe that the "more intense"

A.R.R.L. ACTIVITIES CALENDAR

July 2nd: CP Qualifying Run — W6OWP
July 15th: CP Qualifying Run — W1AW
July 17th-18th: CD QSO Party (c.w.)
July 24th-25th: CD QSO Party ('phone)
Aug. 7th: CP Qualifying Run — W6OWP
Aug. 13th: CP Qualifying Run — W1AW
Sept. 5th: CP Qualifying Run — W6OWP
Sept. 13th: CP Qualifying Run — W1AW
Sept. 16th: Frequency Measuring Test
Sept. 18th-19th: V.H.F. QSO Party
Oct. 8th: CP Qualifying Run — W6OWP
Oct. 9th-10th: Simulated Emergency Test
Oct. 12th: Qualifying Run — W1AW
Oct. 16th-17th: CD QSO Party (c.w.)
Oct. 23rd-24th: CD QSO Party ('phone)
Nov. 6th: CP Qualifying Run — W6OWP
Nov. 13th-14th, 20th-21st: Sweepstakes
Nov. 17th: CP Qualifying Run — W1AW

interest in operating on the part of the DX and traffic groups as shown by the hours is any different today. Power trends, if anything, might go slightly higher and be determined by more rigs in particular brackets.

Incidentally, reports from 213 active affiliated clubs surveyed at the end of '53 and representing 7000 club members, indicated 113 s.s.b. installations in their memberships with 115 others in the building or planning stages. The '52 survey had an exactly comparable question. Installations of 1.61 s.s.b. stations per 100 amateurs in active clubs reporting at the end of '53 compare with .56 per hundred as of the end of '52.

— *F. E. H.*

APRIL CD QSO PARTIES

After racking up 65 QSOs in the first hour, W4KFC kept right on going to register 144,770 points, tops in the c.w. section of the April CD QSO Parties. Runner-up on points was another Virginia section appointee, RM W4HQN, who further distinguished himself by contacting more sections than any other participant. And ORS W7CCC, providing ever-tough Utah for all comers, grabbed slot number three with a stirring 127,737-pointer.

The 'phone session saw W4NTZ (operating the W4HQN kw.) aggregate 48,330 points, a new all-time record for A3 work. Two CD regulars engaged in a spirited skirmish for second place, W9KDV winning out by a whisker. One more gasp from W6UGA, however, could have turned the tables.

Listed below are the highest claimed scores. Figures after each call indicate claimed score, number of contacts and number of ARRL sections worked. Final and complete results will appear in the July CD Bulletin.

C.W.

W4KFC	144,770	460–62
W4HQN	129,280	397–64
W7CCC	127,737	249–57
W3JTK	125,050	410–61
W1MX[1]	120,900	383–62
W6YHM	114,576	224–56
W6BIP	111,320	221–55
W7PCZ	105,930	214–55
W6ISQ	101,210	190–58
W4PNK	100,800	360–56
W4NH	95,410	329–58
W2ZVW	87,175	310–55
W3LMM	87,000	296–58
W4BZE	81,775	292–55
W1RAN	77,825	277–55
W2CWK	77,430	261–58
W2IVS	74,100	253–57
W4IA	70,720	265–52
W1WCG	65,000	260–50
W3JNQ	62,965	257–49
W4YZC	61,920	281–43
W1AQE	61,750	247–50
W1CRW	60,580	233–52
W5DWT	60,320	201–58
W3QOR	59,500	234–50
W1JYH	58,300	206–55
W7UTM	54,400	117–50
W8TZO	52,250	202–50
W9NH	51,700	182–55
W9RKP	51,840	186–54
W8GBF	50,700	188–52
W2LPJ	47,880	223–42
W1ZDP	47,235	194–47
W3KUN	47,970	227–41
W2MHE	46,765	199–47
WØVBQ	44,980	168–52
W1WEF	44,520	207–42
W3HC	43,470	156–54
W1FZ	39,775	180–43
W4WKQ	39,600	176–45
W2KEL	39,200	189–40
W4VHH	39,200	191–40
W4BDU	38,720	176–44
W2AQT	37,975	155–49
W6NTQ	36,080	98–40
W1TVJ	35,875	169–41
W2COU	35,550	151–45
W4TFX	35,530	182–38

'PHONE

W4HQN[2]	48,330	179–54
W9KDV	22,600	113–40
W6UGA	21,204	62–38
W1CRW	19,890	117–34
W4NYN	19,425	105–37
W8NOH	18,480	107–33
W8ZJM	17,640	92–36
W2ZVW	15,840	89–33
W1FZ	14,985	106–27
W1MNG	14,140	96–28
WØBLZ	13,825	79–35
W2MHE	13,760	86–32
W1AQE	13,500	100–27
W6JTF	12,780	71–36
W3QOR	12,375	95–25
W3MLY	12,070	71–34
W8ZXC	11,780	76–31
K6AUZ	11,036	41–29
W1CJK	10,395	77–27
W7PCZ	9720	45–24
W9GIL	8540	55–28
W1MX[1]	7980	69–21
W3EAN	7700	50–28
W4JUJ	7700	63–22
W3JZY	7360	58–24

[1] W4YHD, opr. [2] W4NTZ, opr.

CODE-PROFICIENCY PROGRAM

Have you received an ARRL Code Proficiency Certificate yet? Twice each month special transmissions are made to enable you to qualify for the award. The next qualifying run from W1AW will be made on July 15th at 2130 *Eastern Daylight Saving Time*. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 145,600 kc. The next qualifying run *from W6OWP only* will be transmitted on July 2nd at 2100 PDST on 3590 and 7138 kc.

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

Code-practice transmissions will be made from W1AW each evening at 2130 EDST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes the order of words in each line of *QST* text is sometimes reversed.

Date	Subject of Practice Text from May *QST*
July 1st:	*A 40-Watt Amplifier for 220 Mc.*, p. 18
July 7th:	*High-Power Pi-Network Amplifier* . . . , p. 13
July 9th:	*Cascaded High-Lattice Crystal Filters* . . . , p. 21
July 13th:	*R.F. Chokes for High-Power Parallel Feed*, p. 30
July 20th:	*A Compact Two-Element Beam for Twenty*, p. 25
July 23rd:	*Some Principles of Radiotelephony*, p. 37
July 26th:	*Results — Twentieth ARRL Sweepstakes*, p. 58
July 29th:	*"Mighty Mo" Gets Mightier*, p. 34

DXCC NOTES

Announcement is hereby made of the addition to the ARRL Postwar Countries List of Archipelago of San Andres and Providencia. This designation shall encompass all islands partially or wholly under Colombian control between 12 and 14 degrees latitude and 78 and 82 degrees longitude.

DXCC credit will be given starting September 1, 1954 for creditable confirmations dated on or after November 15, 1945. Confirmations received prior to September 1, 1954 for this country will be returned without credit.

In future ARRL DX Competitions, those making contact with Archipelago of San Andres and Providencia may claim credit for a separate country in accordance with DXCC rules.

DX CENTURY CLUB AWARDS

HONOR ROLL

W8HGW . . . 253	W3GHD . . . 245	W3JTC . . . 242
W1FH 252	W2BXA . . . 244	W8NBK . . . 242
W3BES . . . 250	W6AM 244	W2AGW . . . 241
G2PL 250	G6ZO 244	W3KT 241
WØYXO . . . 248	G6RH 243	W4BPD . . . 241
W6ENV . . . 246	LU6DJX . . . 243	W6SN 241
W6VFR . . . 246		PAØUN . . . 241

RADIOTELEPHONE

PY2CK . . . 233	XE1AC . . . 215	W1MCW . . . 208
W1FH 224	ZS6BW . . . 213	SM5KP . . . 207
VQ4ERR . . 223	W1JCX . . . 211	W8HGW . . . 205
	W1NWO . . . 210	

From April 15, to May 15, 1954 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

DL7BA 163	W1NYA 104	W2AWH 100
W2AFO 131	HB9KB 103	W2SUC 100
FO8AP 118	W2KMZ 102	W3JAK 100
W2SAW 110	EA8BF 102	W8JGU 100
4X4BR 109	PY3QX 101	ON4CY 100
ON4HX 106		VE2KZ 100

RADIOTELEPHONE

DL7BA 118	W2DSU 100	W8VDJ 100

ENDORSEMENTS

W8KIA 231	G2YS 142	W3ZQ 121
G8IG 211	VS6AE 141	YV5AK 121
W6RW 202	W1QXQ 140	W2ESO 120
G3FNN 193	W5DML 140	W9JUV 120
W9HUZ 190	G3EMD 140	VE2CK 115
ON4NC 181	W6CAE 133	W5KBU 114
W6BUD 173	W2FXE 131	WØCDP 112
HAMU 164	W1DSF 130	W3EEB 110
W1JNV 155	W8NGO 124	W3PGB 110

RADIOTELEPHONE

CT1CL 181	HB9LA 150	W1HX 141
CN8MM . . . 170	PY4CB 143	W2TXR 110
HAMU 162		W5KBU 110

CALL AREA LEADERS

W5MIS . . . 240	W7AMX . . . 236	VE4RO 220
	W9RBI 225	

RADIOTELEPHONE

W2APU 202	W5BGP 197	W9RBI 200
W3JNN 195	W6DI 195	WØNCG 145
W4EWY . . . 172	W7HIA 175	VE3KF 163

It seems as though a good many amateurs don't know whether they are "in civil defense" or "in RACES" or not. There is also some question as to whether a RACES organization in the planning stages *is* a RACES organization, or doesn't it become one until it is officially authorized by FCC?

Obviously a matter of interpretation. A RACES organization is certainly a reality in a community which is planning to apply through its amateurs for RACES authorization, especially if it has a duly appointed (but not yet certified on FCC Form 482) Radio Officer and an embryonic (but not yet FCC-approved) communications plan. But since RACES is an amateur radio function for civil defense, one can hardly be said to be "in civil defense" or "in RACES" until he is *actually signed up* in his local or state civil defense organization. That's the very first step. Not even much planning can take place before that.

As one of our correspondents so aptly put it: "None is better equipped to participate in Civil Defense Communication than the amateur radio operator, but he must first accept the obligation of enrollment and qualification for civil defense work as a whole, then be prepared to accept the rôle assigned to him by the civil defense administration, always bearing in mind that communications is only a small, though important, entity in a colossal organization comprising many services and sections, necessarily perfectly integrated and coördinated under one command."

Thus, those unfortunate amateurs who live in areas where there is no established or active civil defense organization cannot execute their duty as amateurs to organize RACES until they have first executed their duty as private citizens, along with a lot of other private citizens, to organize civil defense. If there is no civil defense, there can be no RACES.

There continues to be a lot of confusion in the AREC ranks concerning the relationship of RACES to the AREC. Let's simplify it this way: as far as we are concerned, RACES is *one of the functions* of the AREC. There is no need for it to take over the functions which have been traditionally amateur and AREC functions since 1935 — at least not until or unless our AREC functions are suspended due to war. RACES is a temporary service; the AREC is permanent. Part of our personnel, equipment and services — the civil defense part — is now engaged in RACES or civil defense activities leading up to it. In the event of war, that part will continue to operate (if they are duly authorized for RACES) while those AREC functions not under RACES will discontinue and much of the personnel will swing over to serve in RACES. In such an eventuality, we expect that the AREC will become dormant, but not dead. Meanwhile, it is to the best interest of all that the AREC remain active and alive everywhere, even where a strong RACES organization exists.

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On March 28th W7PCZ/M called W7KUH/M and requested he call the Air Force Base to find location of downed army aircraft. W7KUH/M called army air base and relayed location of accident to W7PCZ/M. W7PCZ/M proceeded to accident scene and sent information to W7KUH who in turn called air base and relayed information. At this point K7FCC located at the army air base contacted W7PCZ/M and traffic was handled directly from accident scene to air base. Also assisting was W7RIL. Although there were no casualties it again proved that the radio amateur operator is always prepared to serve the public in case of any emergency.

— *W7KUH, SEC, Montana*

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On April 22nd, the Great Northern Railways chief dispatcher at Spokane contacted W7FGQ, Spokane EC, with a request for a circuit to Whitefish, Mont., because of a line failure. Purpose was to handle transcontinental train movements. W7EHH was asked to set up the circuit.

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C. W.	*'PHONE*
3550 kc.	3875 kc.
7100 kc.	7250 kc.
14,050 kc.	14,225 kc.
21,050 kc.	21,400 kc.
28,100 kc.	29,640 kc.

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

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *'phone* — 3765, 14,160, 28,250 kc.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

These frequencies are generally employed by amateurs using radioteletype throughout the United States. Other frequencies are under discussion and will be listed in future issues of *QST*.

At 1810, W7JZW/7 in Helena advised he was in contact with the Great Northern line operator at that point and could handle relays to and from Whitefish. However, at 1815 the chief dispatcher called W7EHH and advised that service had been restored. While the circuit thus set up was not actually used, there is considerable significance in the fact that the Great Northern dispatcher immediately contacted the EC and that a working circuit was set up within a half hour after the request was made. Good going, fellows, and thanks to W7EHH who reported the above and to W7s OO, UD and EQM and to the FARM Net who also assisted.

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Further information on the snowstorm emergency in the vicinity of Williamson, W. Va., has been received from Acting SCM for Kentucky, W4SBI. The emergency lasted for four days, from the first through the fourth of March;

♦

This is one half of the circular operation room of W1TIB, Area One NCS for RACES (State of Conn.) at Ridgefield. That's the Area One Director in the foreground, taking everything in. W1FRL is at the left (in plaid shirt) and W1YON with the telephone handset. The others have restricted operator's permits. Area One leads the state in number of RACES authorizations, and Connecticut leads the country. So, says RO W1DBM, this is the No. 1 RACES Net in the U.S.A.!

The Kern County Amateur Radio Club of Bakersfield, Calif., is working with the police department in setting up emergency communications facilities. Here is a shot of their temporary set-up at the City Hall, with W6AZQ in the chair, W6RWW sitting beside the receiver and W6OQL standing in background. The others, including the three youngsters on the left, are working for their ham tickets and will probably be licensed soon.

during this time the net set up by W4SBI handled train reports for three railroads, Western Union telegrams, dispatches for news services, and emergency-type messages for the telephone and power companies. W4SBI estimates he handled some 75 messages, and that the network handled several hundred. Outstanding participants were W4s AZQ NBY RRU JPV MVU UVH VHU ZDA and W8EKF. Others known to have been active (not previously mentioned): W4s QJU TUT OJK JHU VNJ UVF WNF TZG UUQ KBY OBG TUV VDZ DXW JPP MGT NDY KRY ZCM PDA NCQ JDE SMU YZE RHR JKY WPY RHM LVN IQZ PRT BDP JBU KTF NVI, W3YGD/8, W8s BNL VPO KCP SFT GIO TIS KXD, K8NAI, W9s ZHJ PNK.

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On Feb. 15th, 21 members of the Suffolk County (N. Y.) Amateur Radio Club staged demonstration of how they could maintain communications in the event of disaster. A portable two-way radio station was set up in the Lake Ronkonkoma school gymnasium, and twenty cars equipped with two-way radio were guided to the schoolhouse from all parts of Suffolk County. Communication was maintained for more than two hours, from car to car, and car to station. As the cars arrived, they assembled in the schoolyard for inspection by visitors. Later, addresses on emergency communications were given by Lt. Arthur Waldron of the Brookhaven Town Police, and W2OQL, president of the Suffolk County Amateur Radio Club. Stations participating: W2s JFU (NCS), AJF BMV DUR EAF EBT FTV GNI HVG IVX IYS JAT LCU MZB OOQ OQI PDU WMG YMM, K2s BTT and DEH.

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Sixteen SECs reported March activities, representing 3903 AREC members. Four new SECs are added to the "reported" column for 1954: W. Fla., Nebr., San Joaquin Valley and Georgia. Nineteen SECs each have submitted at least one monthly report in the first quarter of 1954. As long as we continue to show improvement like this, we won't complain, even though there are still 54 sections we have not heard from yet this year and 40 we haven't heard from since December, 1951, or before.

CODE-PRACTICE STATIONS

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

W1ACT, Fall River ARC, 57 Richmond St., Fall River, Mass.; 3545 kc.; Mon., Wed., Thurs and Fri., 1900 EST; 5–7 w.p.m.

W1QZO, Harry Warner, 11 Berlin St., Wollaston, Mass.; 146.8 Mc.; Tues. through Sun., 1900 EST; 7–8 w.p.m.

W1SRB, Al Vesce, 84 N. Main St., Thompsonville, Conn.; 29.6 Mc.; Mon., Wed. and Fri., 1930 EST; beginner's speeds.

W1WAG, N. J. O'Neill, 60 Dean St., Taunton, Mass.; 1805 kc.; Mon. through Fri., 1900 EST; beginner's speeds.

W2FSL, Adolph F. Elster, 53 Commercial Ave., Avenel, N. J.; 3675 kc.; Sat., Sun. and holidays, 0730 EST; beginner's speeds.

W2HEI, William Teso, Mountain Ave., Hillburn, N. Y.; 3950 kc.; Sat. and Sun., 1400 EST; 5-18 w.p.m

W2NRM, Howard B. Jack, Brown's Trailer Court, R.F.D. 6, Lodi, N. J.; 29.118 and 145.188 Mc.; Mon. through Sun., 0800 EDST; Mon., Tues. and Fri., 2200 EDST; Wed., 1915 EDST, 3–8–15 w.p.m.

W3UVD, Walter C. Downes, R. D. 2, Box 328, Jeannette, Pa.; 3585 kc.; Sun. 0930 EST, Wed. 1830 EST; 5–15 w.p.m.

W4RUR, Edward J. Blatt, 538 16th Ave. So., St. Petersburg, Fla.; 28.05 Mc.; Mon. and Wed., 1900 EST; 6–22 w.p.m.

W5JRV, Blanchard Boldman, 4802 Ave. Q½, Galveston, Tex.; 1882 kc.; Mon. and Fri., 1900 CST; 3–15 w.p.m.

W6JZ, Ray Cornell, 909 Curtis St., Albany 6, Calif.; 3590 kc.; Mon., Wed. and Fri., 1830 PST, 5–25 w.p.m., 1920 PST, 35–45 w.p.m. (When needed, schedule maintained by W6EFD.)

K6USN, Cmdr. J. M. McCoy, 12th Naval District Reserve Electronics Stn., Bldg. 7, Treasure Island, San Francisco, Calif.; 3590 kc.; Tues. and Thurs., 1830 PST; 5–25 w.p.m.

K7FCV, Lyle B Clemans, CWO USAF, MARS Base Dir., Davis-Monthan AFB, Tucson, Ariz.; 3825 kc; Tues., 1830 MST; 8–20 w.p.m.

W7FWD, O. U. Tatro, 513 N. Central, Olympia, Wash.; 3646 kc.; Mon. through Fri., 1700 PST; 4–25 w.p.m.

W7TPT, Truman T. Gorsline, 949 Mossman, Tucson, Ariz ; 28.8 Mc.; Mon. through Sat. (except 1st and 3rd Thurs.), 2100 MST; 5–18 w.p.m.

W8JJE, Calumet High Radio Club, Calumet, Michigan; 28.3 Mc.; Mon., 1930 EST; 5–10–15 w.p.m.

W8MAI, Blossomland Amateur Radio Assn., c/o W8FGB, Dean Manley, R.F.D. 1, Box 147F, St. Joseph, Mich.; 1890 kc.; Mon. through Fri., 2000 EST; 5–20 w.p.m.

W9NPC, Lewis R. Hill, 212 N. Evanslawn Ave., Aurora, Ill.; 1810 kc.; Mon. through Sat., 1830 CST; 5–20 w.p.m.

W9UIN, Joseph H. Kadlec, 1148 Ashland Ave., Evanston, Ill.; 7240 kc.; Sat. and Sun., 0800 CST; 5–7½ w.p.m.

WØBOL, R. A. Prehm, 1130 Delaware Ave., St. Paul 7, Minn.; 29.2 Mc.; Tues and Wed., 1900 CST; letters to 6 w.p.m., practice from 8–15 w.p.m.

WØEGQ, Bob McMullin, Route 1, Lehigh, Nebr.; 3690 kc.; Mon. through Fri., 1700 CST; 5–13 w.p.m. with text from *The Braille Technical Press.*

WØLQC, F. Bion McCurry, 1234 Stanford, Springfield, Mo.; 29.18 Mc.; Tues., 2130 CST; beginner's speeds.

WØQDF, W. H. DuBord, 10247 Midland, Overland, Mo.; 29.6 Mc.; Mon. and Wed., 2000 CST; Mon. 5–13 w.p.m., Wed. beginner's speeds

AFFILIATED-CLUB CLASS INSTRUCTION

The following clubs are conducting code and theory classes. This information supplements the list appearing on page 70, June *QST*.

Calif.	Loma Linda	Amateur Radio Club of College of Medical Evangelists	Glen Foster, Box 322, CME
Colo.	Denver	Denver Radio Club	Anna Belmonte, 2720 S. Dahlia
Iowa	Des Moines	Des Moines Radio Amateur Assn.	P. D. Church, 710 38th St.
Ohio	Cincinnati	Greater Cincinnati Amateur Radio Assn.	Paul R. Wolf, 1237 Streng St.

NOTICE TO CLUB COUNCILS

In accord with Board policy, *QST* will print a list of Club Councils twice each year. It is our intention to run such a list as early as September or October *QST*. This is to request all such organizations that would like to be included to furnish (a) the complete and correct name of the council, (b) full address and call of the secretary and (for purposes of record) the names of all societies that are members of such council or federation.

TRAFFIC TOPICS

It has been said among traffic circles that the summer season is when we separate the men from the boys. There is a lot of truth in that. The *real* traffic men are the ones who will stick in there through the crashing static, the fading, the lure of the great out-of-doors, the messed-up time changes. The faint of heart, in the dead of summer, close up their shacks and silently steal away.

This tendency will be more prevalent, now that wintertime propagation conditions (for traffic, that is) will soon start on the upgrade. Up to now, many of us traffic men have welcomed the summer which, with all its disadvantages mentioned above (and a few more), at least makes it possible to hear signals. Now the contrast will become sharper. We'll have again (remember?) crystal-clear winter nights with 80, 40 and 20 meters full of signals from all over, all day and all night, and even fifteen and ten open most of the time. We'll have occasional openings of six and even two meters to skip conditions.

But let's not get into the V.H.F. Editor's domain. The point we are sidling up to is that we have noticed a tendency on the part of many traffic men to throw up their hands when the going is tough — and it really has been that during the last few years — whereas if they had kept with it they would have found, with a little application of the seat of the pants to the seat of the chair, that it *could* be done; and they would have felt a lot better (and a little proud) afterwards.

Cheer up, gang. We're noticing changes in propagation conditions already. And if we start on the upgrade now, we predict the coming season will see the greatest upsurge of traffic activity the old prophets ever thought of.

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The Teen Age Net (TAN) reports 30 sessions for a traffic total of 255, averaging 8.5 per session. More representation is needed from the W3 area; contact W1UTH. The Early Bird Net reports 691 messages in 30 sessions. This net will continue all summer, meeting at 0500 EST. Mission Trail Net reports 674 messages in 31 sessions, an average of 22.

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W8DSX points out that one of the small but important points about message delivery, not mentioned in our operating booklet (until the next edition, anyway), is the fact that in delivering messages by postcard the post office will *not* return the card to you if undeliverable *unless* it contains the legend "Return Postage Guaranteed" on the address side of the card — along with, of course, your return address. No doubt many messages have been considered delivered which wound up in the dead-letter office because of this.

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And that leads right into the next subject: with all the garbled traffic floating around these days, you'd think there would be a greater preponderance of service messages mixed in with them. Actually, we have heard very few, and those heard haven't been in proper form. See Page 12 of the operating booklet. Maybe one of the reasons we haven't heard many service messages is that in a good many cases preamble information is too incomplete to properly address such a message. There are two principle reasons why this is the case, namely: (1) refiles, even when properly executed, omit the place of origin and substitute therefor a very general and vague subterfuge; (2) omission of preamble information in feverish haste to handle large quantities of messages, too often resulting in this traffic being passed along through a number of relays, using the word "same" instead of spelling out preamble details, until handling stations forget what it is the same as and conveniently omit it completely.

If we are out only for BPL records and individual self-glorification, that's one thing. If we want only to perform a public service, that's quite a different thing. They *can* be combined, but such combination precludes short cuts, omissions and general slovenliness in our operating habits. How about it, fellow traffickers? Let's insist on complete preambles on *all* traffic, whether it's the "same" as the previous one or not. You and I, in our own amateur organization, are the ones who will have to maintain and protect our standards. If this results in our not being able to handle *all* the traffic, so be it; we have our capacity. But for goodness' sake let's handle properly and accurately what we *can* handle!

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National Traffic System. Managing an NTS net at regional or area level is a rough job — or so we are told. Within the last few months we have had changes of managership in the Second, Fifth, Sixth, and Ninth Regional Nets, and Acting Managers are now holding forth in the Seventh Regional and Pacific Area Nets. In sharp contrast to this turnover, our 1RN Manager (W1BVR) is the "original" 1RN manager, and VE3BUR and W8SCW have been TRN and EAN manager, respectively, for a long time. We're not saying that we *want* turnover or that we *don't* want it; we're just pointing out that NTS net managership is not necessarily a man-killer, that the staying-power of a manager is generally proportional to his qualities as a leader, other things being equal. Also, generally speaking, the turnover of managers in any particular region or area is an indication of the stability of the National Traffic System in that region or area. Let's take a look:

1RN: W1BVR, 1949. One manager.

2RN: W2LRW, 1949; W2CLL, 1949; W2PRE, 1949; W2COU, 1951; K2BG, 1952; W2LPJ, 1954. Six managers.

3RN: W3GZH, 1949; W3GEG, 1949; W3BIP, 1952; W3ONB, 1953. Four managers.

4RN: W4ANK, 1949; W4AKC, 1952. Two managers.

RN5: W4NNJ, 1949; W5MRK, 1951; W5QHJ, 1953; W5MSH, 1953; W5KRX, 1954. Five managers.

RN6: W6CE, 1949; W6JZ, 1951; W6ELQ, 1952; W6JQB, 1952; W6IPW, 1953. Five managers.

RN7: W7CZY, 1949; W7NH, 1951; W7PKX, 1953. Three managers.

8RN: W8NOH, 1949; W8BTV, 1950; W8YCP, 1950; W8SCW, 1951; W8DSX, 1951. Five managers.

9RN: W9LFK, 1949; W4BAZ, 1950; W9TT, 1951; W9UNJ, 1954. Four managers.

TEN: WØAUL, 1949; WØSCA, 1950; WØITQ, 1952; WØDQL, 1954. Four managers.

TRN: VE2GM, 1949; VE3BUR, 1950. Two managers.

EAN: W2BYF, 1949; W2CLL, 1949; W8SCW, 1951. Three managers.

CAN: WØHMM, 1949; W9CBE, 1950; W9JUJ, 1952. Three managers.

PAN: W7FIX, 1949; W7WJ, 1950; W7HKA, 1952; W7NH, 1953. Four managers.

If you will do a little research into the above, you'll see that our regional and area NTS net managers each last an average of about one year and four months. Some of those relinquish their jobs not because they want out, but because they want to give someone else a crack at it. In other words, gang, don't be so reluctant to take on a job as net manager. With a little coöperation from the gang, it's not as rough as you think, and it can be a real education.

April Reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
1RN	22	351	0.41	15.9	94.2
3RN	20	227	0.40	11.3	100.0
RN5	34	284	1.02	8.3	48.2
RN6	48	571	0.58	11.8	28.1
RN7	43	212		4.9	41.6
8RN	20	133		6.6	88.3
9RN	10	78	0.41	7.8	65.0
TEN	69	2548		36.9	67.9
TRN	44	109	0.40	2.4	73.5
EAN	22	799		36.0	97.0
CAN	17	578		34.0	100.0
PAN	24	877	0.68	36.0	97.9
Sections*	300	2223		7.4	
Summary	673	8990	1.02	13.4	100.0
Record	673	8990	1.02	17.8	100.0

*Sections reporting: Kans. (QKS, QKS-SS), Ala. (AENP), Iowa (TLCN), Los A. (LSN), N. Tex (TNX), W. Va. (WVN), NYC-LI (NLY), Wash. (WSN), Conn. (CN & MCN), Minn. (Noon Fone & Evening Fone).

We're still toppling records. Last year we reported 562 sessions for a traffic total of 8826. As sessions and traffic go up, averages come down. The record average of 17.8 harks 'way back to April, 1951.

W3ONB got out a fine 3RN Bulletin, summarizing activities and indicating policies. W3s LMM QV UOE and WV now have earned 3RN certificates. W5KRX regrets omitting Oklahoma from his March report; five stations were active, representing the section 25 times. W6IPW resigns as RN6 Manager retroactive to May 1st. W7KZ reports again for RN7 but declines the net managership, suggesting a "better" man. A partial month is reported by 9RN, having started operation April 14th. Sessions at 1700 and 1945 CST on 3640 kc., Monday through Friday. W9UNJ manager, who says, "Many thanks to the Wisconsin and Illinois gang for their good work and what's the matter with Indiana and Kentucky?" TEN holds three sessions, at 1700, 1945 and 2130 CST; Minnesota was represented 100 per cent in all sessions. TRN will continue through the summer with one session only. W9JUJ reports trouble getting NCSs for CAN; WØSCA always seems to be around to help.

The TCC has several vacancies still, but in general is functioning well. W3COK, W4ZFV and WØRTA are being added to the roster. WØKHQ is off rebuilding and W1TBS was forced to change to another schedule. Central Area TCC Director W9JUJ says no new recruits are available, and a couple of TCC men on the TCC roster have not been heard from. If any of you fellows want to take a crack at long-haul traffic this summer, contact your TCC area director (W6JZ, W8UPB or W9JUJ) or TCC Manager W1NJM.

$\overline{\text{KN}}$? $\overline{\text{ARK}}$!? CL? K?

What ending signals to use, how and *when* to use them effectively, is a perplexing problem to many new amateurs. Since the use of uniformity in procedures increases the ability to communicate, a few basic rules, when properly followed, make the ending signals convey a positive clearly understood meaning (unlike the outdated practice of using $\overline{\text{AR}}$ K together).

ARRL ENDING SIGNALS

Signal	Meaning	*ARRL — Recommended Use*
$\overline{\text{AR}}$	End of Transmission	After call to a specific station before contact has been established. Example: W6ABC W6ABC W6ABC DE W9LMN W9LMN $\overline{\text{AR}}$
		At the end of transmission of a radiogram, immediately following the signature, preceding identification.
K	Go ahead (any station)	After CQ and at the end of each transmission during QSO when there is no objection to others breaking in. Example: CQ CQ CQ DE W1ABC W1ABC K or W6XYZ DE W1ABC K
$\overline{\text{KN}}$	Go ahead (specific station), all others keep out	At the end of each transmission during a QSO, or after a call, when calls from other stations are not desired and will not be answered. Example: W4PGH DE XU6GRL $\overline{\text{KN}}$
$\overline{\text{SK}}$	End of QSO	Before signing last transmission at end of a QSO. Example: . . . $\overline{\text{SK}}$ W6LMN DE W3BCD
CL	I am closing station	When a station is going off the air, to indicate that it will not listen for any further calls. Example: . . . $\overline{\text{SK}}$ W7HJ7 DE W3JKL CL

ARRL Communications Department
Operating Aid No. 2

A convenient card, as shown in miniature, is available from the Communications Department. Operating Aid No. 2, ARRL Ending Signals, will help you follow the rules for more capable operation.

TVI COMMITTEE NOTE

Affiliated-club interference committees are urged to note a new addition to the ARRL Training-Aids Library. The new 16-mm sound film (11 minutes), produced by the U. S. Department of Agriculture, illustrates causes and cures for commonly-encountered interference. The film is ideal for committee showing before a combined meeting of amateurs and servicemen, and is of general interest to all TVLs. Because of the high demand for visual training aids, the usual advance booking by a club officer is required.

W1AW OPERATING SCHEDULE

(All times given are Eastern Daylight Saving Time)

Operating-Visiting Hours:

Monday through Friday: 1300-0100 (following day), except that from July 15th through Aug. 17th, operating-visiting hours will be 1900-0100.

Saturday: 1900-0230 (Sunday). Sunday: 1500-2230.

A lithographed local map showing how to get from main highways (or from Hq. office) to W1AW will be sent to amateurs advising their intention to visit the station. W1AW will be closed from 2230 July 4th until 1300 July 6th in observance of Independence Day.

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

Frequencies:

C.w.: 1885, 3555, 7125, 14,100, 21,020, 52,000, 145,600 kc.

'Phone: 1885, 3950, 7255, 14,280, 21,350 kc.; 52, 145.6 Mc.

Times:

Sunday through Friday, 2000 by c.w., 2100 by 'phone.

Monday through Saturday, 2330 by 'phone, 2400 by c.w.

General Operation: Refer to chart on page 79, May *QST*, for W1AW general-contact schedule. (Exception: from July 15th through Aug. 17th W1AW will conduct no general operation prior to 1900.) Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

Code-Proficiency Program Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies. Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. On July 15th instead of the regular code practice, W1AW will transmit a certificate qualifying run.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for April traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W6IAB	70	1836	1763	84	3753
W3CUL	184	1702	1313	389	3588
KØAIR	58	1452	1450	56	3016
W9UJJ	43	1568	1351	18	2980
K5FFA	49	1410	1417	36	2912
K6FDG	304	1212	1119	68	2703
WØBDR	3	1109	1090	19	2221
KH6FAA	94	1006	852	70	2022
W4PJU	38	982	840	142	2002
WØSCA	8	985	931	49	1973
W3WIQ	36	967	875	41	1919
W9VBZ	19	876	778	25	1698
W7BA	36	828	777	38	1679
W4YIP	9	797	690	105	1601
K4WAR	456	527	421	91	1495
KA3AC	696	698	24	4	1422
W4USA	36	671	8	671	1386
K6FCT	35	697	556	22	1310
KA2FC	410	426	350	68	1254
W5TFB	3	600	575	25	1203
W6SWP	37	578	490	83	1188
W4PL	10	588	461	65	1124
K7FAE	37	515	487	65	1104
K6FCZ	55	524	505	19	1103
W7PGY	20	527	496	31	1074
W3CVE	696	169	123	62	1050
W3USA	67	454	309	145	975
W6LYG	27	434	280	154	895
WØKHQ	7	427	422	2	858
W2KFV	19	406	353	53	831
WØCPI	13	409	374	35	831
W2JOA	52	370	324	36	782
KØFDL	31	362	369	14	776
W2KEB	34	360	212	148	754
W5MN	45	357	177	175	754
W9NZZ	230	256	1	255	742
W6GQY	3	355	271	86	715
W8ELW	24	345	330	7	706
W9IDO	3	346	277	72	698
W9SNT	12	355	306	15	688
W4WQW	128	275	264	9	676
W4OGG	6	335	301	28	670
K5FFB	32	340	266	29	667
W3PZW	13	318	285	33	649
W5PML	521	60	40	20	641
W6ELQ	16	303	276	33	628
W7KT	4	302	285	6	597
W4SCF	58	261	160	101	580
W2RUF	25	301	185	67	578
W7SFK	2	286	286	0	574
K5FEF	113	218	206	9	546
WØGAR	8	255	254	9	526
Late Reports:					
WØBDR (Mar.)	12	885	861	20	1778
KA7RC (Mar.)	122	370	352	18	862
KA2HQ (Mar.)	165	302	218	66	751
WØCPI (Feb.)	8	351	323	28	710
W9CGC/9 (Mar.)	34	335	268	59	696
K4WBP (Mar.)	31	235	219	20	505

BPL for 100 or more *originations-plus-deliveries:*

K5USA 417	W4DRD 122	WØNIY 112
WØLO/Ø 338	W2JZX 119	W9UNJ 111
WØRTA 215	W5YJ 117	K6BAG 102
W4DFU 178	W6PHT 117	WØFDJ 102
W4OCG 175	WØNFX 115	W3IKN 101
W7HAK 145	K4WBG 114	K5FGJ 101

The BPL is open to all operators who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month.

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, W. H. Wiand, W3BIP — SEC: IGW. RM: AXA. PAM: PYF. E. Pa. Nets: 3610, 3850 kc. The Lancaster RTS held its 9th annual banquet on April 24th with over 100 hams and guests present. Director Crossley, YA, gave a talk on current amateur matters, while hypnotic demonstrations plus a trio of juvenile tumblers furnished enjoyable entertainment for all. The following officers were installed: GJA, pres.; RKN, vice-pres.; OY, secy.; UMX, treas.; EYY and KKG, dirs. PYF reports the DLRC held its annual club dinner on April 15th with 45 amateurs and YLs present. The South Philadelphia Amateur Radio Klub (SPARK) has a complete station on the air with the call TQW, using Collins gear and a Gonset Communicator. UQJ reports that SST, using a high-gain antenna and a power output of 4 watts on the 420-Mc. band, was heard by 2QED 125 miles distant. TEJ is a new OBS appointee and is very active on the Pennsylvania 'Phone Net. The Hill School Radio Club station, MWL, is now an OPS. JAK has returned from DJ1JA with an XYL and will be active until entering the Army. EU is teaching code classes at his local RC. NOK was at the controls of NMR/3 during the Lancaster Hobby Show, where 62 messages were originated and sent. OZV reports his new vertical ground-plane antenna is working out FB. CUL is back in the swing of things again after enjoying a restful vacation in Florida. Amateurs in Luzerne County interested in membership in the AREC should contact DUI, EC of the County. DUI can be heard on the E. Pa. Net frequency every evening from 1830 on as well as on 2 meters, where he's looking for more activity in that area. Many letters have been received asking why a report sent to this office was not found in this column the following month. For your information, all reports received are used. However, two months will have passed before your report is seen in this column. As an example, this report is for the month of April. It had to be mailed to ARRL by May 7th and allowing one month to edit the many reports received by ARRL it appears in the July issue. Traffic: (Apr.) W3CUL 3588, BFF 267, NOK 167, ONA 92, VNJ 91, BIP 87, PYF 86, AXA 73, UOE 51, QLZ 43, GES 36, RSC 36, KAG 34, OZV 31, TEJ 31, MLY 28, GIY 19, DUI 17, SHP 17, PVY 12 VKW 10, MWL 8, TKB 6, VN 2. (Mar.) W3RSC 36.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Arthur W. Plummer, W3EQK — Welcome to the Andrews Electronics Assn. of AAFB with 29 members. Meetings are held every 3rd Fri. and officers are 4VXJ, pres.; 3RV, secy.-treas.; URQ, act. mgr. LUL pushes the buttons off his vest over Junior passing the Novice test. PZW is on his way back to Arctic Circles again. AYS, with three-element beam, worked 4X4BL and makes 'phone WAC. WRC members paid a visit to WWV Apr. 16th. OSF completed a speech clipper designed by HWZ. QMG, MO, VLE, FVX, THI, and OSF are Ghost Netting these days (or nights?). QQS is being heard nowadays from a Millen 90801 transmitter. DRD is in moving and rig installation activities. NPQ kept Connecticut folks informed through 1AFB as to 1BUC's condition until his death Mar. 27th. W3AV, W1AFB, EPE, and other W3s in MDD handled funeral detail traffic. YHI, at AAFB, is getting good results on 2 meters. OSF is managing a W3 contest. Contact him. MDD closed down for the summer on May 7th to reopen again Sept. 7th. HXN handled Mother's Day traffic for G.I.s. Two hundred Easter messages filed with Baltimore USO were handled by ham radio; Director Cross will depend on MDD and others to handle traffic for G.I. families on a year 'round basis. QOM had his 100-watt transmitter (7F8 osc.-7W7-2E26 driving 4-65A final) stolen. The Panel had Type AM dials and crystal socket with s.s.b. switch, injection switch and pitch control. A CLOCK-TROLA clock also was stolen, with either the 3- or 4-A.M. tab broken. Local gendarmes and hams were notified. QZC is building a new hi-fi amplifier and modulator with high-gain var. input. Don't forget to attend the MEPN picnic July 11th at Gambrill State Park near Frederick, Md. The Andrews Electronics Assn. used VJU's property at Epping Forest for Field Day. This Club and the Washington Mobile Club will furnish communications for the Sport Car Races at Andrews Air Force Base. IYE will be back in full glory as soon as the new house is completed. DLD snagged FO8AJ with 50 watts. CVE reports 9JUJ as a recent TCRN station. TCRN now includes 6BAM, 4SCF, ØKA, 4PL, 2BO, 6KYV, 9UNJ, 9EBL, and honorary member KG6FAA. ONB suggests that with MDD closing members are invited to check into 3RN Mon.-Fri. at 1945 on 3590 kc. to keep traffic moving. Excellent idea! WKB is on 2 meters and 50 Mc. The Delaware Amateur Radio Club each meeting night holds one hour question and answer session 7–8 P.M. NNX is in the throes of erecting a new 2-element Telrex beam for 20 meters. TGF has a new console and a 200-watt 813 final. UE rolled up 53,800 points in the April CD Party! The Washington Radio Club recently toured Broadcast House (WTOP) and WWV. PKC and WV yap at each other on 10-meter phone every night in the week at 11:00 P.M. The Mountain Amateur Radio Club at Cumberland has 25 actives, and had a transmitter hunt May 23rd. The ARA (Hagerstown) meets the 1st and 3rd Tue. of each month in Red Cross Hq. OYX is Red Cross Communications Chairman. Field Day and TVI problems have taken up most of the time on ARA meeting nights. RLR should have his TV camera and receiver built ere long. LUE is back in the running after having ticker trouble. Traffic: (Apr.) W3CVE 1050, USA 975, PZW 649, IKN 238, COK 91, UE 88, ONB 73, WV 71, JE 58, PKC 19, CQS 16, QCB 15, WSE 13, HKS 6, NNX 6, OYX 2. (Mar.) W3ONB 128, NPQ 4.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brooks, K2BG — SEC: W2UCV. PAM: ZI. 8DB, Camden, is working lots of DX on 20 and 40 meters running a kw. Congratulations to Bill on receiving his WAC certificate. Let's hear from others who have recently received ARRL certificates for their efforts. ZI has been taking part in CD Parties and also LO-Nites with that new rig. HX is heard regularly on MARS nets. JWA now is editor of *DVRA News* and is doing a fine job. K2BDA and K2CFP, we believe, have joined the fast-growing 2-meter ranks. ORA, as usual, furnished a very complete report of his OES activities. BAY has been appointed OBS and hopes to keep the section informed of important news with his regular Official Bulletin transmissions. We are badly in need of willing and qualified fellows to serve as EC and Assistant EC in the southern part of the section. Looks like CCO is going s.s.b. from reports received. DZU is heard Sunday mornings on the N. J. Emergency 'Phone Net. ZVW, RG, and ZI are representatives from this section to 2RN. The Burlington County Radio Club meets the 1st Fri. of each month. The Club station will operate on 2 and 10 meters. GOK did a swell job in the recent Frequency Measuring Test. Traffic: W2RG 196, K2BG 61, W2ZVW 50, ZI 28, HAZ 5, K2CPR 4.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — Asst. SCM: Jeanne Walker, 2BTB. SEC: UTH/FRL. RM: RUF. PAMs: GSS, NAI. NYS meets on 3615 kc. at 6:30 P.M. and on 3925 kc. at 6 P.M.; NYSS on 3595 kc. at 7 P.M. Mon., Tue., Wed. and Fri.; Sat. at 4:30 P.M.; NYS C.D. on 3509.5 and 3993 kc. at 9 A.M. Sun. Ye SCM requests all NYS C.D. 'Phone Net members to QNI promptly and help speed up operations as al c.d. business must be cleared in the short time alloted to NYS under the alliance with other states using the same frequency. TYC resigned as Asst. Mgr. of NYS C.W. and ZRC has been named in his place. ECs are needed for the following counties: Cortland, Hamilton, Montgomery, Schuyler, and Tioga. On April 16th, Lockport ARC sponsored a meeting to which clubs and amateurs in the area were invited to hear a talk by the Atlantic Division Director, 3YA. The traveling companion of 3YA was his son, 3MFS. 3YA visited SJV and RUF en route. CWB, FEB, and K2AQY are on 2 meters. UTH reports a very good Aurora opening on 2 meters Apr. 11th working 4PCT, 8s OMY, RWW, and BAX, and hearing N. J., Ill., Ind., Ohio, Ky., Mass., Conn., Vt., Que., and Ont. The Elmira ARA elected the following: R. Sykes, pres.; J. Sbedico, vice-pres.; M. Henrich, secy.; J. Post, treas. RAWNT election results are LXE, pres; PPY, vice-pres.; TAX, treas.; KLF, rec. secy.; GBX, corr. secy. KN2GUG has been appointed Novice Coördinator for the Club. Both COU and ZRC can vouch to the good cooking of RUF after a recent visit and chicken dinner. ZRC has an NC-125. EMW received his BERTA, WBE, and KZ5 certificates. KBT held annual auction. K2GIH

and DSM are heard on all bands. K2CUQ reports NYSS is very patient with beginners in traffic work and requests that more call into the net to get acquainted with traffic procedure. K2ACA now is checking in on MARS. BFX QNIs the Connecticut Net in the A.M. and NYS C.W. and 'Phone in the P.M. QHH hooked FO8AJ on 3.5 Mc. UXP has crystal-controlled converter going on 2 meters. RZP renewed EC appointment. KN2CUX passed Tech. Class exam. The Greater Buffalo Mobile Club met at Cheektowaga Town Park for its first outdoor meeting of the year. OZR and ROL attended a meeting of the Northern Chautaugua ARA and spoke on c.d. At the Madison Co. ARA meeting held in Stockbridge Valley H.S. Guest speakers were Capt. J. E. Edwards and M/Sgt. J. Olsson, of Griffin AFB, who addressed the group on MARS. Traffic: (Apr.) W2RUF 578, HKA 145, DSS 92, EMW 91, OE 78, K2ACA 61, W2OPD 26, ZRC 21, VEP 12, K2DG 11, DUQ 11, W2RQF 11, IEP 10, QHH 8, K2BFX 7, W2DVE 7, K2BVE 6, W2QLI 2. (Mar.) W2FGL 8.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — SEC: CA. RMs: GEG, UHN, NUG. PAMs: AER, LXE. At a recent meeting the BARC received a fine demonstration on the use of Antennascope by RMX and IIX. On 2 meters are IIX, TCP, TMA, and RMX. RMX, IIX, and 4PTU are on 75 meters checking handie-talkies. Active in the area are CEL, NMJ, KUN, RUS, WHO, VEE, WII, VEF, and OCB. The Washington County Amateur Radio Club is celebrating its first birthday. We wish them many happy returns, and a continued successful active club. The Club net, WCN, meets on 3700 kc. at 2000 EST Sun. The Radio Club of Erie held an air raid drill with amateur mobile handling the communications. Mobiles were TLA, OIH, PIX, and MED. The Club's emergency trailer will be at the Home Show where the Club also has a booth to demonstrate amateur activity. Director Crossley, YA, and his son, SMF, recently attended an RAE meeting with Crossley speaking on subjects concerning amateur radio and activity in the Atlantic Division. The Radio Association of Erie has presented the East High School library with a copy of the *Handbook* in memory of Harold Loomis, KQB. The Steel City Amateur Radio Club sends me its fine publication, *Kilowatt Harmonica*, from which I obtained the following items: NRQ soon will change the YL to XYL, VBL is airing a Lysco 600, the Club now has a TVI-proof Viking II, OMY was active in the 10-meter ground-wave contest, RXT still is on 2 meters and aiding the Pittsburgh Weather Bureau with emergency communications, MPO and UUG come up with a 32V-3. Traffic: W3WIQ 1919, LMM 329, UHN 88, QPQ 62, LXQ 60, YA 53, KUN 42, SIJ 42, NCD 30, OEZ 30, VKD 16, TSY 15, NMJ 11, KUQ 9, KNQ 8, NCJ 8, UTR 4.

CENTRAL DIVISION

ILLINOIS — SCM, George T. Schreiber, W9YIX — SEC: HOA. Asst. SEC: VTL. EC Cook County: HPG. PAM: UQT. RM: BUK. Section Nets: 'Phone IEN, 3940 kc.; C.w. ILN, 3515 kc. KMO has registered for summer courses at Marquette U. ZOU got his General Class license and is teaching his parents the code. BA turns in a fine report as EC of St. Clair County. The St. Clair County Amateur Radio Club held its annual family night meeting and the fish fry was enjoyed by all. The Club issues a certificate to anyone who works ten amateurs in the county. JSQ's 11-year-old son is Novice EWV. CHS's XYL got her General Class license. 5YOU/9 graduated from radio courses at Scott AFB and was retained as instructor there. The Elgin Radio Amateur Service Club got a nice break in the local newspaper with pictures of the officers, WTC, YWR, and ZOS. At a recent meeting SWO was married in the club room. The ceremony was performed by OWD. Best man was LKK. The Fox River Radio League has been reactivated. WOO commutes between Illinois and Iowa working 75-meter mobile on week days and fixed on week ends. ZEN reports the State license on a Connecticut hearse as U2. OKQ and AZJ, father and son, have a 75A-2 between them. PVK gave an all-ham party recently with STZ, WFC, CZR, QPL, JGA, OKF, KCW, NW, NWU, and VNW among those present. GDI has 41 countries on 80-meter c.w. CKU put up a Windom and works plenty of DX. He was AC2RN in 1928 and would like to hear from his old pals. The Chicago Suburban Radio Assn. has returned to its original meeting place, Broadview Village Hall. DEI enjoyed a vacation in Colorado working mobile all the way. HYK, 81 years old, is still active and runs rings around his son, DPY. ALI spends time between walking the floor with his new jr. operator and DXing. NN's kw. is not so cool anymore. The fan fell out of the rig into the waste basket and NN burned it with the rest of the trash. CXC is a new call in the Chicago Area. JGL spent several weeks flying around Europe and egging the Pan-American radio operators to let him work the equipment on the ham bands. NIU reports things in police circles are running so smoothly that APCO meetings have become hamfests. JMG has a new vibrator power supply for emergency work. LMC built a new antenna tuner and reports into ILN regularly. UZE is a new net member. USA is using a new beam on 20 meters on top of the 12th floor Army Headquarters. CQR, who pounds brass all evening for the Army, gets on the 40- and 75-meter ham bands at home. 5AOJ/9 is the new Signal Corps instructor at the U. of I. and trustee for the ham rig, K9WAE, which runs a quarter of a watt on 6 meters. UIN received more than 50 thank-you notes for his slow-speed on-the-air code lessons. The Watchdog Net (2 meters) is interested in c.d. work, reports USI. The Tri-Town Radio Club reports five s.s.b. rigs in the Club, BVW, FVP, OQN, ABI, and PVD. PHE reports the Jersey-Green County Net has started operation. AND had loads of fun operating portable as XE1AND. HPJ got an automatic keyer head for his transmitter which will send at speeds of from 15 to 500 w.p.m. New calls heard in the Elgin Area are Novices FUP, FWE, and FVZ. UTN, Rock Island County EC, reports a revived interest in c.d. Traffic-handlers for the northwestern portion of the section are needed. If you hear any of them on the air invite them into ILN or IEN. Traffic: (Apr.) W9DO 698, CGC/9 202, SME 116, YIX 97, CTZ 81, MRQ 81, USA 60, BUK 56, CEE 55, MXF 51, LXJ 48, CIW/9 37, VHD 35, SXL 33, DUA 22, QBH 20, UIN 19, USI 14, PHE 9, LMC 1. (Mar.) W9CGC/9 696, CSW 290, OR 55.

INDIANA — SCM, George H. Graue, W9BKJ — The Indiana Radio Council of Clubs held its semi-annual conference at Wabash, April 25th. Wabash Valley RC, Clarkville County RC, Key and Mike ARC, Madison County ARC, Richmond ARA, Western Electric RAC, Tippecanoe ARA, Elkhart ARC, Cass County RC, Mobile RC, and Bloomington RC were accepted into membership. The IRCC Hamfest-Picnic will be held at Frankfort, Sun., July 18th. YWE resigned as Mgr. of QIN; OLX is new Mgr. SNT made BPL on 'phone the first month as an OPS. NZZ and JUJ made BPL on c.w. The second monthly AREC drill of TARS was a simulated train wreck. KVE/m acted as NCS. Others were MCN/m, NYX/m, MOH/m, OCL/m, RIT/m, RBV/m, FJI/m, HRH/m, LXA/m, OVB/m. Fixed stations assisting were DGA, AIN, UMS, and GFS. The Mobile Radio Club of South Bend is sponsoring a 2-meter net along with the 29-Mc. Net. RFN traffic as reported by JBQ was 46. NTA reported for IFN with a total of 270. OLX reports the total traffic for QIN as 387. JBQ is Clark County RC president. DKC is on 40 meters again at new QTH. DPT put up a new antenna. QYS and URJ are mobile. DFW has an 813 final. OGX now is 7VBR on 14 Mc. FXY is the call of the Martinsville High School Club. The LCARC station, ZKW, will operate at the Boy Scout-O-Rama. SNF was Field Day chairman for Lake County. PAS is c. . officer for Hammond. RWN graduated from Valparaiso Tech. Radio School. AST has a new Viking. 6ODO/9 is new in Hammond. YXX now is General Class. AQA made General Class with the help of ALS. MAM has his Globe King working FB. IFR now is 4FAJ in Birmingham, Ala. UB, BYY, FWN, and AQA are on 147.3-Mc. mobile. JUJ will operate ZUX from Hamilton Lake week ends this summer. STC will operate GDL at Flat Rock this summer. VNV again is mobile with a new car. PPO will be aeronautical mobile on 147.3 Mc. N9FVR is new in Muncie. MEU/4 contacts home regularly via IFN. CMT is newly-appointed PAM. NTR is giving the c.w. speed test to a c.w. code class. DGA reports that the TARS trailer nears completion. CUT and QBD, while trying out new mobile rig, ran out of gas. PXZ and DKR heard the appeal and supplied the needed gas. The FWRC completed its first successful transmitter hunt. Traffic: W9JUJ 2980, NZZ 742, SNT 688, TT 295, UQP 219, STC 113, JBQ 104, QYQ 63, YWE 50, VNV 45, NTA 42, BKJ 41, LZI 34, WBA 30, QR 29, DOK 28, OLX 28, KDV 24, MEU 20, NYK 20, PPS 16, CMT 13, WUH 9, ZIB 9, EQO 8, FYM 8, GUX 5, DGA 4, NH 4, NTR 4, DKR 3.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: ESJ, GMY. RMs: MQV, UNJ. Nets: WIN, 3625 kc., 6 P.M. daily; BEN, 3950 kc., 6 P.M. daily; WSPN, 3950 kc., 12:15 P.M. Mon.-Sat., 9:30 A.M. Sun. State Mobile and c.d. frequency: 29,620 kc. BVZ chalked up a record-shattering total of 1698 and still found time to work FO8AJ! 9RN, under the direction of UNJ, has been meeting at 1945. WWJ has forsaken 20 and 40 to delve into traffic-handling. Using 65 watts and an S20-R receiver, VYX worked ZL1CI on 3.5 Mc. ZAN has a new Viking. WYG applied for WAS certificate. AFT is using new three-element 20-meter beam. DSP has a new Viking II and completed a 144-Mc. portable rig. RKP received DXCC and OTC certificates. MRAC mobiles ESR, MDG, LSK, MPF, JXY, ONY, VBZ, and KMO handled communications for VFW Loyalty Day Parade on May 1st. Stevens Point has 5 new Novice licensees in WN9GHY, GHJ, CFW, CFS, and CFO. After missing FO8AJ because of a trip south, KXK picked up VK9AU for No. 119. The WVRA Hamfest was attended by more than 400 representing 8 states on May 8th. The Mancorad Club is putting the finishing touches on its new club house. FMH is putting mobile in new Austin-Healy sport car. TRG and RYV are busy in the ham gear manufacturing business. QNO is building a walkie-talkie. EC RKT is doing a fine job on c.d. communications. YCJ is landing DX on 21 Mc. with low power. KQB has a new Clapp oscillator working. The Kenosha Club has a new call — W9BOM. Net certificates (WIN) have been issued to KQB, NVJ, YAH, YLE, and VBZ. WBD has separate mobile, portable, and fixed rigs on 4 Mc. Printed BEN rosters (25c) are available from MPO. CFN, DAJ, DAP,

and EBP are new calls in Wausau. RACES licenses have been issued to all ECs under the State plan. Register with your EC now to become a part of the c.d. and RACES program. Traffic: W9VBZ 1698, UNJ 225, SAA 196, CXY 166, IXA 96, GMY 86, LSR 52, RTP 22, WIR 18, VYX 15, ZAD 12, UIM 7, RUB 6, AEM 5, RQM 5, AFT 4, DSP 4, CFP 3, RKP 3, KWJ 2.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Earl Kirkeby, WØHNV — The Red River Radio Amateurs Club gave ham radio in this section a nice boost with its amateur radio display at the hobby show at Fargo in April with an on-the-air set-up that worked out fine, thanks to many coöperating hams. New on the air is UAI, Marylyn. She reports that they have started a teen-age net on 75 meters at 7:30 A.M. Mon., Wed., and Fri. NPR seems to be our live wire. He reports into eleven nets, 'phone and c.w. The North Dakota C.W. Net has QRT until next fall. RM LHB reports a very good season for this net. NQI, at Fargo, has a very fine 'phone patch working. POT is on the air with a 15-watt home-brew 75-meter mobile rig. HNR also has a new all-band VFO mobile rig going. Traffic: WØLHB 138, NPR 76, EXO 42, JBM 42, FVG 22, KTZ 17, HNV 7, BFM 6, PHH 3, CAQ 2, SGF 2, USY 2.

SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — Asst. SCMs: Earl Shirley, ØYQR; Martha Shirley, ØZWL. SEC: GCP. RM: SMV. PAMs: NEO and PRL. PHR, ZIQ, CSD, OOZ, SMV, and RRN visited the Mitchell ARC. New calls: Novices — TLF, Mitchell; TLO and TBX, Sioux Falls; TLU, TLP, TKT, TMB, Vermillion; TLI, Freeman. KYO, Yankton, dropped the "N," as did QKV, Custer. QKV is mobile with a Gonset Super Six and 15-watt transmitter. The C.W. Net, in 14 sessions, handled 71. The 160 Net held 17 sessions, with 264 QNI and handled 24. The 160 Net discontinued for the summer on April 30th. CSB is dropping out of ham radio for a time. NEO and PRL promoted and organized the first South Dakota QSO Party. Prizes were donated by BJV. GCP has worked 24 stations in 5 states on s.s.b., but has yet to work South Dakota. PHR has a new NC-183D and RRN has a Morrow converter. OOZ is installing a mobile rig and awaiting General Class ticket. LXS and QDU received General Class tickets. GWS moved into the house vacated by GWL and uses the antenna left behind by GWL. Traffic: WØGDE 137, SMV 71, ZWL 55, SCT 26, GCP 11, AYD 6, RRN 2, QKV 1.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, ØGGQ. SEC: GTX. RMs: OMC, DQL. PAMs: JIE, UCV. We have a new Section Emergency Coördinator, GTX, of Alexandria. George plans on having an active emergency unit in every county and town in the State. Give him your fullest coöperation. Two new OPS appointees are IRJ and KFN. The Mobile Amateur Radio Corps of Hennepin County now has its Dodge Route Van fully equipped with radio gear with accessories and antennas. The main equipment consists of a 32V-3, Harvey Wells, NC-183, and a 1-kw. gas generator. 6- and 2-meter equipment also is being installed. The equipment was in operation at a public showing at a c.d. demonstration in Excelsior for the Minnetonka Radio Club and at an engineering exhibit in the Mechanical Engineering Building of the U. of M. OTL and KMI participated with their gear at the hobby show at Albert Lea. DQL has a new antenna up for 80 meters. DQL, TKX, and JPH are giving code lessons for the Minneapolis Radio Club. RHL is learning to fly. DKJ, of Aberdeen, is operating portable in Minneapolis. 5ZBS has applied for a zero call and has bought a Viking I. BRA has moved to Scotia, Calif., and at present is operating with his mobile. The Mankato amateurs have organized the Mankato Area Radio Club. Meetings are held the 2nd Thurs. of each month at 8 P.M. Code classes are held each Thurs. at 7 P.M. at the Vocational School at Mankato. Officers are PBY, pres.; TOF, vice-pres. and secy. DQL has been appointed Tenth Regional Net Manager. WNØTYX and TQQ are new amateurs in Minneapolis. 7RNV has been operating mobile in the Twin Cities. MBD is operating portable at Pine River this summer. QIN is back from a vacation in Arizona. EHO is back after being in South Dakota for the last 4 years. Join the AREC NOW! Traffic: WØKLG 351, DQL 281, HUX 185, UCV 122, KFN 93, TKX 86, EHO 77, SWB 69, LUX 63, NJZ 47, MVJ 41, BUO 35, CXM 34, MXC 34, GTX 31, KNR 27, OJH 24, CID 21, HIN 20, TJA 19, RQJ 17, AGD 16, WTP 16, FIT 13, GQZ 11, IKJ 11, OPA 11, ALW 10, FFU 9, GGQ 9, AFP 7, GWU 7, HAH 7, PAM 6, EYW 5, FYT 5, HMV 5, LIG 5, BMO 4, W5ZBS 4, WØGWJ 2, NTV 2, MJJ 1.

DELTA DIVISION

ARKANSAS — SCM, Fred Ward, W5LUX — It's nice to have the reports this month, and seems that lots of the boys have been going after the traffic. FMF has had a spell of flu that cut his total down. VAE has been active on 20 meters and moves a lot of 'phone patch traffic. ZZR has made WAS and is keeping skeds with a DL4 and a VO6. VAE and ZZL have been giving talks to the Batesville and Newport business men's clubs. OEF has new all-band rig with p.p. 1625s. NLL lost his 20-meter beam and his XYL's TV antenna in a recent wind. Les, better fix the TV first. Traffic: W5VAE 27, FMF 24, ZZR 13.

MISSISSIPPI — SCM, Dr. A. R. Cortese, W5OTD — SEC: KHB. PAM: JHS. RM: WZ. Only one report was received this month, gang. You must be slow pokes or "sumpin?" K5FGJ is at Keesler and made BPL this month. No reports came from any of the clubs. A nice hamfest was held at Gulfport recently and your SCM met a lot of the gang eyeball to eyeball. I will give a report when I get one. Traffic: K5FGJ 247, W5OTD 6.

TENNESSEE — SCM, Harry C. Simpson, W4SCF — Your new SCM notes with sadness that active stations are more plentiful than monthly reports from same. Send the dope, fellows, and we'll let the country in on Tennessee activities. Thanks to WQW, ADX, YNK, and others, and the Union City Centennial, traffic was heavy on the Tennessee Nets in April. All stations did a wonderful job on the Centennial traffic. The Crossville Picnic, July 11th, will draw amateurs from all over — a real DON'T MISS IT special. The Memphis Hamfest, which last year drew 400 from 13 states, will be bigger and better on July 18th. Val Peterson, FCDA head from D. C., inspected Memphis Club station, W4EM, talked to the Nashville office via DQH, PQP, and AEE, and was very complimentary about the amateur's part in c.d. Ham School, sponsored by the Memphis Club, is in full swing with 30 students well on the way to hamdom. Classes are held three nights per week for 6 weeks and will be repeated in the fall. DCH and ZER handled the brunt of the load, with assists from ADC, YMB, and others. Congrats to Union City on its new club and new club station, EZS. PL, dean of our traffic men, is recovering from blood poisoning. Our Ben is just 70 years YOUNG! Traffic: W4YIP 1601, PL 1124, WQW 676, OGG 670, SCF 580, OEZ 260, TYU 218, IIB 161, TZD 89, CXY 81, UOA 38, VJ 32, UWA 24, VJX 18, DTI 16, NJE 14 RMJ 12, ZJY 12, HIH 6, RRV 4, TIE 1.

GREAT LAKES DIVISION

KENTUCKY — Acting SCM, Robert E. Fields, W4SBI — K4WBG is looking for RTTY contacts on 80 meters. WNH has a 2-meter converter and is putting up a 2-meter beam. In addition to his HT-9 OMW now has a pair of 814s p.p. final, a pair of 811As as modulators, running 350 watts. CDA has been rebuilding, TVIing, and now has the urge to build a 20-meter rig with the stuff he had left over. JCN again is active in traffic nets. WXL says school work is keeping him busy, but he finds time for some traffic-handling. TUT is planning some experiments. ZLK says he hasn't had too much time for traffic-handling this month. KKW is a new RM appointee. NBY is off to Florida again, but will be back soon. BAZ has been doing an FB job with KYN until an RM could be appointed. NIZ and WNI are alternating as NCS of the newly-organized Western Kentucky 'Phone Net on 3960 kc., 1730 CST week days. VYD soon will have a new set of store teeth and a 'phone rig with suppressor modulation. AZQ is hard at work building coils for an antenna coupler. NVR now has his antenna up again, thanks to MVU and Tom Miller for helping. SBI still is having trouble with the "Old Black Coffin," but will keep the air hot with the HT-9 until we get it and the BC-669 going. Traffic: K4WBG 189, W4BAZ 124, ZLK 66, SBI 64, WNH 61, WXL 47, CDA 37, JCN 34, KKW 20, NIZ 15, VYD 15, AZQ 8, OMW 2.

MICHIGAN — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Robert B. Cooper, 8AQA; Joseph Beljan, 8SCW. SEC: GJH. The Jackson and Lansing Clubs held one of their popular joint meetings on Apr. 1st, with an exhibit and talk by a Heath Company representative. The door prize (transmitter kit) was won by an SWL of course! The Niles/Buchanan Club is running very successful code practice classes, using records for personal instruction, and running "on-the-air" practice sessions every Sun. at 0900 on 3600 kc. The Huron Valley gang used mobiles for tracking down model airplanes at the model meet at Ann Arbor airport last year and has been requested to provide the same service again this year. The Genessee Club participated in a very successful civil defense demonstration at Flushing on Apr. 28th, using 75, 10, and 2 meters. DX conditions have been poor for the traffic men this month, according to our regular DX hounds. ELW says that because of the rather crowded condition of our own nets he finds it easier to pass traffic direct into out-State and regional nets. AQA still is in the middle of house alterations; no shack, no antenna, no home, and almost no wife! DLZ is leaving for a month's vacation in Puget Sound country, the old home. TBP enjoyed a visit at the James Knights Lab, and was sufficiently impressed by the 125-foot skyhook described in October *QST*. RTN has returned from two-weeks training at Fort Devens, Mass., and is back on the night shift. WVL is QRL spring cleaning. The house or the shack, Tom? FX is rebuilding; says it will be the complete rig this time. SWF has new 75-meter antenna 55 feet up! OQH also is sporting a new antenna; an off-center-fed job. THG is having trouble with home-brew VFO. By the time this is in print Field Day will be past history for this year. Hope you all had the usual wonderful time, and will enjoy a good active summer with the mobiles and portables. Traffic: W8ELW 706, RJC 408, NUL 144,

(*Continued on page 84*)

SPEECH CLIPPING

PEAK CLIPPING of speech seems like so simple and obvious a way of getting the most out of a speech carrier that amateurs have been using it for years; and familiarity has bred a certain contempt for it as a simple technique that has been fully exploited. At NATIONAL we have been taking a rather close engineering look at the possibilities and have come to the conclusion that the surface has only been scratched when 8 to 12 db. of peak limiting has been applied somewhere between the microphone and the modulator.

Let us list some of the things that properly engineered clipping can do in speech — not 12 db, but 30 to 60 db. of clipping correctly used:

1. It permits virtually 100% modulation of your carrier 100% of the time you speak. (12 db. gives you 100% modulation only about half the time, and then mainly on vowel sounds.)

2. It is the most effective audio AVC known; under some conditions you can drop the speech input level 30 or more db. with an output level drop of less than 5 db. (Try that without clipping and see what happens!)

3. Properly used it involves no loss of intelligibility whatsoever in connected speech, and under adverse listening conditions like high ambient noise at the listener's ears, it can significantly increase (yes — increase) intelligibility.

4. It completely preserves the recognition of the speakers identity since this does not depend on the perfection of speech wave form that the Hi-Fi fraternity values so much.

5. If you don't care too much about point 2 above, it can even be made to meet the pleasing quality demanded by the people who pride themselves on BC quality. (But don't try to pump music through a clipping system: it won't sound like music.)

6. Have you thought of the fact that clipping at a low level close to the microphone can save you as much power for a given output level in your modulator as it does in your RF stages? This should particularly interest you mobile operators.

At National we have been doing some basic work on the properties of speech and the kinds of equipment that can take advantage of these properties through clipping and other related techniques. Keep "Tuned to Tomorrow" by watching these pages for NATIONAL ideas and equipment that can give you better speech communication for fewer dollars.

RALPH HAWKINS, W1OEX

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LAFAYETTE
Lafayette Radio Supply, Inc.
627 Main St.
MUNCIE
Muncie Electronics Supply, Inc.
305 N. Madison
SOUTH BEND
Radio Distributing Co.
432 Carroll St.

IOWA
COUNCIL BLUFFS
World Radio Laboratories, Inc.
3415-27 W. Broadway
DES MOINES
Radio Trade Supply Co.
1224 Grand Ave.

KANSAS
TOPEKA
The Overton Electric Co., Inc.
522 Jackson St.

KENTUCKY
LEXINGTON
Radio Equipment Co.
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Radio Parts, Inc.
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BALTIMORE
Kann-Ellert Electronics, Inc.
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Henry Radio Co.
211 North Main
KANSAS CITY
Radiolab
1612 Grand Ave.
ST. LOUIS
Walter Ashe Radio Co.
1125 Pine St.

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DULUTH
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Northwest Radio
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MINNEAPOLIS
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Hall Electric Co.
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BILLINGS
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CONCORD
Evans Radio
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NEW JERSEY
ATLANTIC CITY
Radio Electric Service Co.
of Pa., Inc.
452 N. Albany Ave.
CAMDEN
Radio Electric Service Co.
of Pa., Inc.
513-15 Cooper St.

NEW MEXICO
ALBUQUERQUE
L. B. Walker Radio Co.
114 W. Granite Ave.

NEW YORK
ALBANY
Ft. Orange Radio Distributing Co., Inc.
642-644 Broadway
AMSTERDAM
Adirondack Radio Supply
185-191 W. Main St.
BUFFALO
Genesee Radio & Parts Co.
2550 Delaware Avenue
JAMAICA
Harrison Radio Corp.
144-24 Hillside Ave.
NEW YORK
Harrison Radio Corp.
225 Greenwich St.
Harvey Radio Co., Inc.
103 W. 43rd St.

NORTH CAROLINA
GREENSBORO
Johannesen Electric Co., Inc.
312-14 N. Eugene St.

OHIO
CINCINNATI
Steinberg's Inc.
633 Walnut St.
CLEVELAND
Radio & Electronic Parts Co.
3235 Prospect Ave.
COLUMBUS
Universal Service
114 N. 3rd St.
DAYTON
SREPCO, Inc.
314 East Leo St.
SPRINGFIELD
SREPCO, Inc.
119 W. Main St.
TOLEDO
Selectronic Supplies, Inc.
1320 Madison Ave.

OKLAHOMA
TULSA
Radio, Inc.
1000 S. Main St.

OREGON
PORTLAND
Pacific Stationery
Wholesale Radio Dept.
414 S.W. Second Ave.

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ALLENTOWN
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1042 Hamilton St.
EASTON
Radio Electric Service Co.
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JOHNSTOWN
Cambria Equipment Co.
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3412 Germantown Ave.
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5930 Market St.
Radio Electric Service Co.
of Pa., Inc.
N.W. Corner 7th & Arch Sts.
PITTSBURGH
Cameradio Co.
1211 Penn. Ave.
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George D. Barbey Co., Inc.
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Specialty Distributing Co.
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Radio Equipment Co.
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TACOMA
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WISCONSIN
MADISON
Satterfield Radio Supply, Inc.
326 W. Gorham St.
MILWAUKEE
Central Radio Parts Co.
1723 W. Fond du Lac Ave.

(*Continued from page 80*)

ILP 132, JKX 107, JYJ 102, IKX 99, QIX 97, SJF 77, FX 76, SCW 56, WVL 45, NEJ 44, MLR 43, NOH 42, W7UTX/8 31, W8IV 30, WXO 25, RTN 22, TBP 20, TQP 17, OQH 15, HKT 14, FSZ 9, BRV 6, THG 6, SWG 5, DSE 4, EGI 4, HSG 2, ZXC 1.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: C. D. Hall, 8PUN ('phone); J. C. Erickson, 8DAE (c.w.); W. B. Davis, 8JNF (adm.). SEC: UPB. RMs: DAE and PMJ. PAM: PUN. Appointments made in April were JSV, LQB, and NTL as ECs; ORY and IVE as OOs; and HHF as ORS. The Ohio Intrastate QSO Party of April 17/18 was a howling success with close to 300 stations either actively or passively participating. Although AJW was the winner in total points, HUX worked the greatest number of counties (51). Scores were AJW-8500, HUX-4992, MEI/8-3760, AQ-2886, BIM-2160, JHH-1888, CPU-1872, IJH-1681, EQN-1271, FEM-925, MQQ-836, RO-493, RM-323, ILC-308, AL-288, HHF-285, FRD-240, NNY-216, DAE-210, RZ-144, WN8OYX-143, QCU-108, BTW-100, EYE-81, PIJ-49, CRL-25, WM8OIM-16. The top five will receive certificates along with WN8OYX, top WN scorer. The Worked Toledo, Ohio Award (WTO) is being offered by the TRC to any amateur who has contacted 15 stations in the Toledo Area, which includes Holland, Maumee, Perrysburg, Sylvania, Curtice, Moline, Walbridge, Trilby, and Rossford. QSLs are not required. Send QSO details to HHF, Custodian. AJW received WTO No. 1. The WASS (Worked All Sycamore *Smiths*) is being awarded by the Smith family of Sycamore (somewhere in Ohio) to any amateur who has QSOed QOV, SPU, KGL, and OSD. The West Park Radiops have made their Worked-10 certificate available to Ohio amateurs not residing in Cuyahoga Co. or the six surrounding counties. Two lovely ladies, HUX and SPU, were the first Ohioans to qualify for this one. It is rumored that the Sandusky Valley group also is going to issue an award. Our sincere sympathy to HGW, whose wife recently passed away. The CACARC picnic and summer hamfest will be held on July 25th at Roundup Lake Park near Aurora. The SWL who sent valentines to the Barnyard Net members claims she is no longer young and attractive; hence, her deep admiration for the oldsters who comprise this net. LHV has acquired a BC-459 and 696. IFX has rightfully refused to handle unsigned "guess who" messages. Active Ohioans on 8RN are RO, IFX, SG, YCP, DSX, FYO, UPB, and KJP. JDK has been boning up on c.w. while DSX is trying to get a 10-meter 'phone rig to percolate. HOT is using a stovepipe for a vertical. PNY and YGR were Toledo representatives in the Inter-City Radio Rifle Match. KXN is organizing the Adams Co. Radio Club. KQY, ILC, JAR, OUK, and KZN are building 6146 rigs. DG spent much of April in Dixieland. Newly-elected OCARC officials are VTP, chairman; HNP, vice-chairman; VHO, secy.; AL, treas. Dayton's *RF Carrier* reports the passing of VJK after a long illness. The DARA V.H.F. Contest was held May 8/9. This gang recently wound up in 3rd place in the ARRL V.H.F. SS. GCARA'S *Mike & Key* tells us that code certificates were issued to 20 students. The Fort Hamilton *Bulletin* remarks that OEQ, age 12, passed his General Class exam; and that Novice OUK had the temerity to submit his SS results to ARRL. Toledo's *Shack Gossip* informs us that PCS has a new 20-meter beam; Medicos AVB and PNY are back to brasspounding; and KPJ got married. Springfield's *Q-5* states that the club is sponsoring an interclub contest. Eastern Ohio *Ham Flashes* reports that HLA and QI are conducting code classes in Warren; ADA and LCD have built "peanut whistle" 2-meter transmitters and QNC is a new science professor at Youngstown College. OVARC's *Ether Waves* expounds considerably on the club's accomplishments in the last SS Contest. *Carascope* out of Columbus reports that DWP is the new trustee of TO, the club station; ARP has received his MARS certificate; UZ has returned from the hospital; and EYE (Great Lakes Division Vice-Director) has moved to Salem, Ohio. Traffic: W8FYO 459, UPB 389, YCP 134, DG 131, RO 110, AMH 83, DAE 71, ARO 69, HNP 68, GDB 65, IFX 54, AL 48, AJW 38, LHV 38, HUX 36, RZ 36, SRF 36, LMB 35, GZ 23, LZE 19, DL 18, FSM 17, IJH 17, EQN 15, BPE 13, CTO 12, KIH 12, KXG 12, TLW 9, WYL 9, OCR 8, WAV 7, ET 6, GCP 6, ILC 6, JIF 6, HFE 5, KZM 5, BLS 4, JNF 4, TJD 4, HHF 3, KXN 3, PIY 3, CRA 2.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RMs: TYC, KBT. PAMs: GDD, JQI, IJG. A very excellent dinner party, under the chairmanship of K2AXY, was held at the Nelson House in Poughkeepsie. Among the invited guests present were League officials ILI, RTE, RMM, JWN, and CYW. Others were Ws KYF, RCO, CGT, APF, NZE, and RGP; also K2DFR, K2EST, W1VVS, and W1UOQ. K2CYS/2 finally made RCC. Eliot is a proud member of the College Net. MRQ is TVI-proofing his new 200-watt rig. Congrats to IFP, who received his Extra Class license. ZBS is a member of the newly-formed TVI committee in Pok. Rolf also is a new OPS. OKI is bicycle mobile on 14 Mc. with a power of one-half watt. LRW is rebuilding the big rig again

(*Continued on page 86*)

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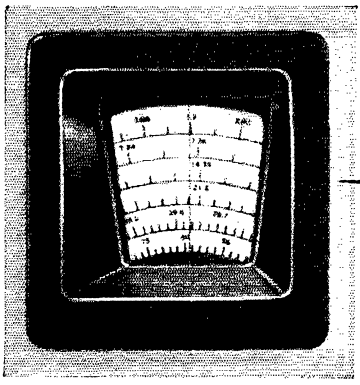

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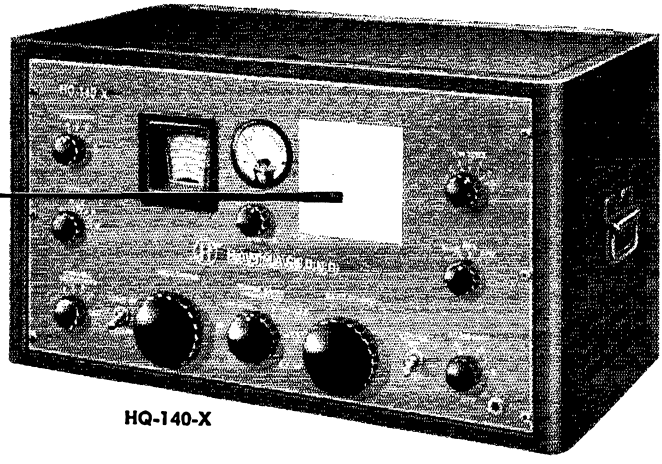

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This is one of the reasons the HQ-140-X is preferred by Hams. It's the amateur receiver built to professional standards. These professional standards include little extras in design, circuitry and construction not normally found in an amateur receiver.

The extras show up in performance. In addition to its excellent stability the HQ-140-X receiver gives you:

EXTREME SELECTIVITY — sharp signal separation even in the most crowded bands.

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RUGGED CONSTRUCTION — built to "take it" for many years.

Investigate the many extras offered by the HQ-140-X. It's available as a cabinet model or for rack mounting. For complete details, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, N. Y. Ask for Bulletin R-70.

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Because of its dependability, the HQ-140-X is the receiver used by many local amateur groups for civil defense as well as other emergency use. Consider it as *the* communciations receiver for your CD operations.

HAMMARLUND

SINCE 1910

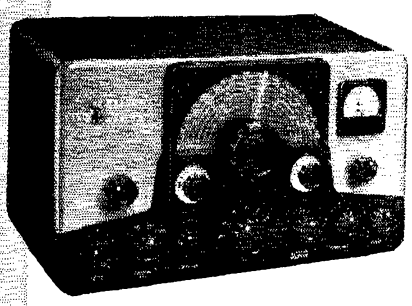
and will be QRP with his Viking. K2EOQ, who is very active on the 3.5- and 7-Mc. traffic nets, is trying out the 1.8-Mc. band. New in Yonkers is KN2HML. KN2EWC has Technician Class license. GSB, KGY, LPN, and SZ were awarded Section Net certificates for activity on the College Net. Congrats to K2BDJ, who has acquired an XYL. We hear that John is teaching her the code. BSH helped with the SARA plans for Field Day. New in Armonk are KNs HQX and HRQ. AWQ is revamping a 522 and has acquired a complete RTTY set-up. K2EIU has dropped the "N." K2CQS is tired of 3.8 Mc. and is going to try 14 Mc. for a change. The HHRL is planning many social and interesting events and a cordial invitation is extended to all. WARA's hidden transmitter hunt went off in grand style with about 16 mobiles entered. Winners were: First prize, GHH; second, AEH; third, AWQ; booby, K2BKV, three grapefruit. Traffic: (Apr.) K2BJS 201, EOQ 68, BE 47, W2APH 31, ILI 30, KBT 23, CFU 22, ZBS 19, GDD 13, MRQ 9, ANB 2, PHO 2. (Mar.) W2LRW 40.

NEW YORK CITY AND LONG ISLAND — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry Dannals, 2TUK. SEC: ZAI. PAM: JZX. RMs: VNJ, LPJ. Congrats to TUK on the new jr. operator. TZD is active on 10 meters. JTZ, Chaminade H. S., should be heard more often now that K2GJR has dropped the "N." ZAI is sporting a new car. KN2DZD passed Tech. Class exam. KN2HTO, on 80 and 40 meters, is going for WAS. BXK was in New Jersey hills for Field Day. JXM passed the Extra Class exam. Queens Radio Amateurs Club officers are MJO, pres.; LUX, vice-pres. and treas.; GXC, secy. Congrats to GPK and OM K2AAO on the new son. 1BDI and 2OBU were recent visitors at the New York Radio Club. New members of NYRC are PEG, CQO, and GZH. K2DDC made General Class. KN2HEA and HQG are active on 2 meters. KN2EBU, K2ESO, W2MWY, and 8YE are new L. I. YLRL members, bringing the total to 19. W2JZX and K2EP handled three conventions in Long Beach. TUK tried out the Gonset Communicator while aero-mobile with his dad, GG. TLAP has merged with TL "J" and the Hobo Net to form the United Trunk Lines operating in three divisions, east, central, and west, on 3570 kc. starting at 9:15 P.M. EDST. The eastern division is looking for NCSs. EC is active in this and the NYS C.D. C.W. Net on Sun. GP completed grid-dipper and it works! K2CUI repaired the twin lead on his dipole, 230 feet up on top of a water tower. GXC reports working Novices and now is running out of QSL cards. KQC reports over twenty stations active in the 2-meter nets which meet Tue. and Thurs. at 2000 EDST on 146.25 Mc. for the N. Y. C. Area and 146.1 for the L. I. section. The nets also meet on Sun. at 1030 EDST on the same frequencies. The 10-meter band has opened up a bit lately. OME, mobile on L. I., is working midwest stations. IN is on with s.s.b. and a.m. on the low frequencies, in addition to his activity on 2 meters. VNJ reports low ham activity because of making two long trips to Europe during the month. However, the NLI C.W. Net continues with good activity. AZS made OO Class I. AEV made Class II during the recent Frequency Measuring Test. DYP is making some receiving tests while flying in a whirlybird. VL, of the Nassau Radio Club, reports KN2GQA, HEA, HJN, and HMH all new Novices from the club school. LGK is mobile on both 10 and 20 meters and reports AFA and VDT new Tuboro RC members and MES and QYS as club federation delegates. KJG has his big rig completed and operating, running 400 watts with up to a kw. available. Nassau EC FI reports 79 RACES station licenses have been issued with more to come. Both RACES and AREC drills are being held. Our SEC, ZAI, requests all ECs to send in their reports by the 1st of each month together with any news. No change has been reported in the AREC membership during April, a total of 710 members in our section. The Central N. Y. Training Net operates on 3720 kc. at 10 A.M. Sun. and 5 P.M. Tue. for Novice stations. HEI, ex-NCS of the NYSS, is on at 3GQF. GF is sporting a new car. GPQ and KQC were made OPS during the month. IVS is busy at school but will be on during the summer vacation. Traffic total for the month was 3673, compared with 4890 last month, showing the effects of QRN and school exams. Traffic: W2KFV 831, JOA 782, KEB 754, JZX 265, JXM 229, LPJ 142, VNJ 119, GP 118, EC 87, VL 70, AEE 57, PF 32, EEY 25, KQC 22, LGK 22, GXC 21, KJG 19, OME 19, GPQ 14, IN 14, K2DEB 12, W2CLG 9, IVS 7, AEV 4.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: NKD. PAM: CCS. RMs: CGG, WCL, NKD. DXD sends in his monthly report from Bombay, India. He is on a trip around the world, stopping at Pakistan, Great Britain, India, and Japan. K2EMW reports, as secy. of the Jersey City ARA, that the Club has a real FB station at the Roosevelt Stadium, Jersey City. The membership totals 90 at the present time, and any new hams in that area are welcome to inspect the station. JT is new Passaic County Radio Officer. Bergen County RACES Net averages 136 stations reporting in on weekly drills. LUL is the call of the new RACES station in the Paterson C.D. Hq. NIY was visited by many of the new hams in his area during the past month. KN2GTD is in search of a good buy on a small transmitter. Can anyone help? KN2HDH is having good luck on 3.7 Mc. K2DPO

(Continued on page 88)

Two pace-setters... with the famous Johnson name



A rugged, compact transmitter, the Viking Ranger may also be used as a flexible exciter without modification. Self-contained, 75 watts CW or 65 watts phone input. Crystal control or extremely stable built-in VFO—100% AM modulation—high gain audio. Pi-network antenna load matching from 50 to 500 ohms—complete TVI shielding and filtering. Covers all amateur bands from 10 to 160 meters—completely bandswitching. Used as an exciter, the Ranger will drive any of the popular kilowatt level tubes, providing a quality speech driver system for high power modulators as well. A power receptacle at rear provides filament, low voltage, and modulator plate power for operation of an auxiliary VHF rig on other equipment.

Extremely compact (only 15"x11-1/16"x9") the Ranger is designed throughout for easy assembly by the novice or experienced amateur. Wiring harness, punched chassis, all parts, hardware, and connectors furnished. Complete step-by-step assembly instructions, pictorial diagrams, and operating instructions included.

Cat. No. 240-161—Viking Ranger Kit, less tubes, crystals, key and mike.....**$179.50 Amateur Net**

Cat. No. 240-161-2—Viking Ranger, wired and tested, less tubes, crystals, key and mike **$258.00 Amateur Net**

VIKING RANGER TRANSMITTER/EXCITER KIT

VIKING II TRANSMITTER KIT

TVI suppressed and with enough power to work 'round the world, the Viking II covers all amateur bands from 10 to 160 meters. 100 watts phone output, 130 watts CW. Instant bandswitching—VFO input provision—dual power supplies. All stages metered. Pi-network coupling output amplifier. Self-contained—no plug-in coils. 100% amplitude modulation.

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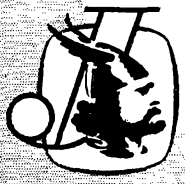
Cat. No. 240-102-2—Viking, II. wired, tested with tubes, less crystals, key, and mike..... **$337.00 Amateur Net**

For complete information: Write for booklet 724 containing circuit and pictorial diagrams of the Viking Ranger. (The NEW Johnson General Products Catalog 975 covers the complete line of amateur equipment.)



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is giving 3.9-Mc. 'phone a try. EBK keeps weekly skeds with his son 8PQX (ex-DXU), who is attending college in Ohio. AFG sits just a few desks from NIY in the new A. T. & T. office in White Plains. DRV reports a total of better than 16,000 points in the CD Contest. K2BYB, *Newark News* staff photographer, became interested in the hobby through his photo assignments of hams and ham stations for EKU's column in that paper. VPL is planning an elbaborate project on 1300 Mc. to correlate solar disturbances and v.h.f. propagation conditions. LTI alternates between 75-meter 'phone and 80-meter c.w. K2BIF runs 500 watts to an 813 on 28 Mc. BAI is back from a Florida vacation. The Windblowers V.H.F. Society officially christened the new trailer "Windy." The first day on the air from the trailer resulted in 10 hours of operation on 144 Mc. Good results were obtained with ISK at the controls. K2BWQ is a new OO. K2DDM is a new OES. EWZ is slated for National Guard training at Camp Drum this summer. K2DSW worked the 6L6 rig overtime during April. His efforts resulted in a KV4AA contact. K2AFQ has a new vertical antenna on 40 and 80 meters. He also is building a new all-band 75-watt rig. K2CTL is looking for a good used communications receiver. KN2CTJ passed General Class exam. K2ENZ is active as NCS in TCPN. The Elizabeth TVI committee received a nice commendation from the FCC for its work in that city. IIN and VQR attended a recent meeting of Hudson Division personnel called by Director Cooke. NIE is active on 75 meters with his new rig and on 144-Mc. mobile marine. EGM has a potent signal on 160 meters. NCZ is on the air with a new Viking. K2AAX is a new station in Lakewood on 75 meters. KN2GER, 15 years old, is the latest licensee in Ocean County. K2DHE is working on a new s.s.b. rig as well as 28-Mc. mobile installation. K2EBL is about to move to one of the Western states. DAV is on the air with a new Viking II. K2BAY still is looking for a crystal so he can join the Jersey Net. Can anyone help? Traffic: W2CQB 356, CCS 155, EAS 131, K2BWQ 81, DSW 73, ENZ 38, W2HIA 29, FPM 26, DXD 19, DRV 8, CFR 4, CJX 4, NIY 4, K2AFQ 2.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — This report is submitted by Asst. SCM Dr. A. J. Ploog, ØSCA. Our SCM is taking a much-needed vacation after months of overtime work, putting WHO TV on the air. Latest preliminary information is that the Midwest Division Convention will be held Oct. 16th and 17th at Hotel Fort Des Moines, Des Moines, Iowa. The TLCN Party will be held the night before. NTB has had a long siege of hospitalization, but if the wishes of every amateur in the State will help, he will be as good as new before this goes to print. AUL and XYL are the proud parents of a daughter. A new addition to TLCN is YDE, who moved to Cedar Rapids from Nebraska. DRV has new Globe Scout and is getting a big kick out of being a 'phone man. LGG received her 20-w.p.m. Code Proficiency certificate and QNI in traffic nets. MDU and GKN are leaving Burlington for the State of Nevada. Fellows, your SCM has a pretty good idea of what you are doing and truly appreciates your efforts but be sure and send in your monthly report, regardless of which phase of amateur radio you are interested in. Let's make "Ole" Bill sit back and say, "Boy, am I ever proud of this Iowa 'phone, c.w., DX, u.h.f., c.d., EC, mobile, etc., gang." Thanks a million, gang, see you all in Des Moines, Oct. 16th. Traffic: (Apr.) WØBDR 2221, SCA 1973, QVA 109, BLH 97, NGS 78, PTL 33, LJW 14, FMZ 8. (Mar.) WØBDR 1778.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. PAM: FNS. RM: KXL. The WARC and ACARA are sponsoring a super hamfest June 27th at YMCA Camp Hyde, west of Wichita. Don't forget to send in your Field Day results to Headquarters. The c.d. club station, TYL, of Scott City, is now on the air with Viking I, Viking VFO, HRO-5TA1, and long-wire antenna, the entire outfit being portable. The first get-together of the Kansas QKS C.W. Net members was held at Manhattan May 9th, a banquet being served in the KDR dining room with EOT presiding. MVG, ICV, and PAH gave short talks followed by round-table discussion and wound up with a recorded satire of a QKS drill. Those attending were EOT, FEO, YFE, MLG, MUY, NIY, PAH, WGM, MVG, ICV, SVE, QVO, NHX, KFS, LHX, GCH, BLI, BAH, FDJ, and CWG. MVG spends most of his time at home on 2 and 6 meters but has FB mobile in his 88 ('54 vintage). VBQ has finished fixed or mobile rig and receiver on 6 meters and works FRL's QRP rig several miles. He has his ears alerted for some other 50-Mc. stuff, either skip or from Topeka or Kansas City. PLS, of Salina, is all set for emergency work with Viking II, Harvey Wells in the car, and two walkie-talkies. Congratulations to all you fellows on your FB traffic-handling and reporting. Traffic: KØFDL 776, WØBLI 441, NIY 388, SIG 219, EOT 213, FEO 211, FDJ 154, NFX 118, PSL 92, KFS/Ø 70, OHJ 65, BET 64, MXG 62, ONC 44, GCJ 28, VBQ 18, QGG 17, ABJ 16, ICV 15, JDX 14, TNA 10, YFE 7, DEL 6, LIX 5, LOW 5, CET 4, GCH 4 LQX 4, QVO 4, RRL 3.

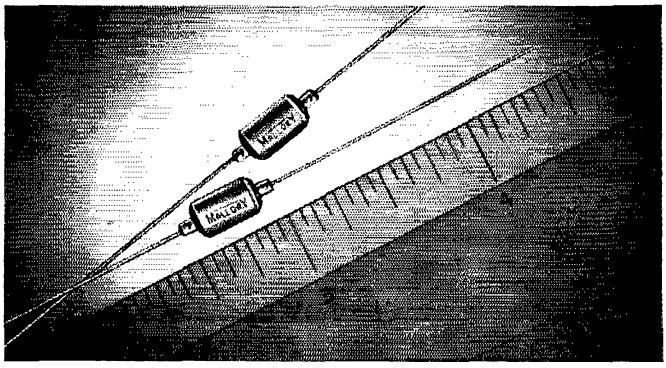
MISSOURI — SCM, Clarence L. Arundale, WØGBJ

(*Continued on page 90*)

MALLORY HAM BULLETIN

Save space in transistor circuits... with

Silverlytic* subminiature capacitors



The first time you try experimenting with transistors, you'll discover that standard size components completely dwarf the transistor itself. A standard 0.1 mfd/400 volt paper tubular capacitor, for example, takes the space of almost half a dozen transistors.

Mallory capacitor engineers determined to find a way to make capacitors small enough to permit the compact design that is one of the most attractive features of transistors. The result of their research is an amazing new family of *Silverlytic* capacitors, designed especially for transistor circuits.

Housed in tiny sealed containers and equipped with axial leads, these new capacitors measure only $\frac{7}{32}$ inches in diameter by $\frac{3}{8}$ inches in length ... just about the size of a transistor. They're available from your Mallory distributor in ratings of 1 mfd/10 vdc, 2 mfd/5 vdc, and 4 mfd/4 vdc, in aluminum anode construction. This style has been assigned catalog prefix "ALA". Several additional values can be "made to order", from 0.1 to 4 mfd.

Another family of Mallory *Silverlytics*, with tantalum anode, has been developed for use where strict specifications must be met for temperature variations, shock, vibration, life during period of inactivity and DC leakage. Designated with catalog prefix "TAP", they are available in capacitance values from 2 mfd/100 vdc to 30 mfd/6 vdc. Their case is similar to that of the "ALA" series.

Imagine 5 mfd. of 50-volt capacitor in a tiny metal container smaller than the eraser on a lead pencil ... and with electrical characteristics superior to most standard size replacement capacitors! *That's exactly what you can expect from Mallory "TAP" Silverlytics.*

You can get the "TAP" capacitors in experimental quantities for prototype designs. Production quantities will be available soon. For specification sheets on both the "ALA" and "TAP" Silverlytics, write to us at P. R. Mallory & Co. Inc., Box 1558, Indianapolis 6, Indiana.

And remember—visit your Mallory distributor often, for all your electronic component requirements. He's a good man to know.

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MALLORY

— SEC: VRF. PAM: BVL. RMs: OUD and QXO. A large number of Missouri hams attended the Eureka Springs gathering on April 3rd and 4th. The Amateur Radio Club of Central Missouri is operating under the call SXY and is conducting code and theory classes for those interested. TSZ is assisting MON as NC one night each week. OMG has added a negative clipper to his transmitter and has installed a new Hy-Q-Mobile antenna on the mobile rig. JAO has a new Viking mobile rig. CPI has earned his 19th consecutive BPL certificate in as many months. KA is building a new rig with a 4-125A final. The Ferguson High School Radio Club welcomes WNØTGD, TGE, and TGJ. MON certificate has been issued to EBE. KYT is on with a Harvey-Wells. EIQ holds OBS appointment. ARH is using new T2FD antenna and likes it. IJS has received his RCC certificate. PWN recently received his General Class ticket. QXO lost a relay in the big rig so his traffic work was limited while waiting for a replacement. GAR and CPI again earn BPL certificates. RLM is in Port Arthur Radio School for a few months. A wind storm damaged the 20-meter beam director for CPI. HUI has started rebuilding the big rig. SAK, with the aid of PME, got his antenna up. New AREC member: EVI. WNØTGC is on 40 meters with Eldico TR-75 and SX-71. We recently learned of the passing of YKK of Appleton City. ECE is a police captain. Traffic: (Apr.) WØCPI 831, GAR 526, BVL 165, QXO 164, KA 135, IJS 125, GBJ 106, EBE 65, EEE 52, ZVS 52, ECE 41, BZK 39, HUI 34, CKQ 28, OUD 20, QWB 15, KIK 13, TSZ 13, NXA 12, BUL 8, CXE 4, RLM 4, PWN 2, QMF 2, WIS 1. (Mar.) WØRLM 11, WIS 3.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM: Tom Boydston, øVYX. SEC: JDJ. The Teen-age hams in the Midwest now have a traffic net all their own. TAN meets Mon. through Fri. at 1630 CST on 3885 kc. NCS for TAN is MGM. The Soo Radio Club (Sidney) is looking for someone to give one of their Courtesy Award Certificates to. They are monitoring bands looking for recipients of this award. It is not necessary to be an amateur and you don't have to work a member to win. Just be courteous. For those working all the licensees in the Soo Radio Club there is a certificate of achievement and honorary membership. New EC is GDZ, Sidney. KDW is new OPS. LRD is now in Camp Gordon, Ga., and can be heard on K4WAR. The Nebraska C.W. Net meets daily on 3520 kc. at 1845 CST with EUT, FQB, and RDN as NCS. They are in liaison with TEN. New officers of the Tri-City Club at Scottsbluff are VQN, pres.; VQR, vice-pres.; CDL, secy.; EWN, historian. There now is a 10-meter monitoring station in Omaha on 29,640 kc. 8 A.M. to 5 P.M. Mon. through Fri. If in need of information while mobiling through Omaha give them a shout. FQB is all tied up with Boy Scouts and other Youth Activities for the summer. Traffic: (Apr.) KØAIR 3016, WØZJF 213, HTA 132, FQB 100, AEM 68, VYX 62, KDW 45, ERM 27, EGQ 24, MAO 24, OFL 18, FMW 16, WR 16, CBH 12, JHI 11, MLL 11, DJU 8, KGA 8, KLB 8, MPE 7, BUR 6, HQQ 6, LRK 5, FXH 4, HQN 4, LGT 4, NGZ 4, BEA 3, KØFBD 3, WØIRW 3, NPZ 3, CIH 2, CQQ 2, DDP 2, HXH 2, IAY 2, LEF 2, OBT 2, QHG 2, RAM 2, RRH 2. (Mar.) WØLXL 42, KDW 38.

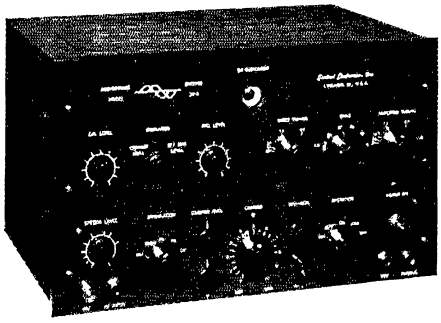
NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC: LKF. PAM: RRE. RM: KYQ. MCN and CN, 3640 kc.; CPN, 3880 kc.; CEN, 29,580 kc. The Choate School, YEY, sports new Viking II and VFO on 15, 20, and 80 meters, per WXB, secy. New ORS: TSZ, TYQ, and RFJ. New OBS: TSZ, AYC, BIH, and ODW renewed ORS appointments while RMW renewed EC. TYQ worked FO8AJ. YU installed a second 400-watt position to handle the operator demand and is active also on 144 Mc. JUD, LXV, TWX, UDF, YEV, and YU are reported active on the College Net. BIH has a new 14-Mc. beam rotating for c.w. DX. BDI rebuilt a VFO. Most consistent reporters on CPN are VWL, MLT, and LIG. On CN its KYQ, RRE, and LV, while BVB, IBE, and WCG lead on MCN. GIX continues OBS schedules and added Fridays at 2130. ODW reports active on the C.D. Albert Net. RAN is back home for the summer and is active on 80 meters with a new antenna. HYF is enjoying his retirement from SCM duties. The Radio Club of Windham High School, AJN, now has a transmitter capable of an output of 50 watts in addition to its Hammarlund Super-Pro receiver. Officers of the Club are Andrew A. Artimovich, pres.; Richard L. Barber, vice-pres.; William F. Cheney, secy.; and Peter E. Beckwith, treas. Thanks for the many traffic reports; how about station activity reports? If you don't tell me, the gang will never know! Traffic fell off with the advent of daylight time, but net conditions and attendance held up well. Traffic: (Apr.) W1AW 173, KYQ 155, TSZ 132, RRE 119, EFW 113, BVB 108, UNG 88, CUH 82, NJM 79, LIG 77, QJM 55, WNH 48, YU 46, YBH 35, YYM 35, JYF 33, RGB 33, BDI 32, FTM 29, LV 29, RFJ 27, VOV 21, YWU 15, KV 14, VOS 10, AYC 8, RAN 5. (Mar.) W1CUH 93, YUX 49.

MAINE — SCM Bernard Seamon, W1AFT — SEC: BYK. PAM: BTY. RM: OHT. The Pine Tree Net summer

(*Continued on page 92*)

Why Fight It?



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- **40 DB or More Suppression** of unwanted sideband.

MODEL 10B
SUCCESSOR TO THE POPULAR MODEL 10A

- **10 Watts Peak Output SSB, AM, PM and CW**
- **Multiband Operation** using plug-in coils.

Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.

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MODEL A IMPROVES ANY RECEIVER

Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts QRM in half. Exalted carrier method eliminates distortion caused by selective fading. Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC TV receiver sweep harmonics.

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QT-1 ANTI-TRIP UNIT

Perfected Voice Operated Break-in with loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic — no relays. Plugs into socket inside 20A or 10B Exciter.

Wired and tested, with tube....**$12.50**

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Plug-in IF stage — used with Slicer, allows receiver to be switched back to normal.

Wired and tested, with tube.....**$8.50**

PS-1 NETWORK

Plug-in prealigned 90° phase shift network and socket available separately for use with GE Signal Slicer and SSB Jr.....**$8.95**

WRITE FOR LITERATURE

MULTIPHASE EQUIPMENT

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Watch For Early Announcement Of The New DeLuxe MULTIPHASE VFO.

schedule is Mon., Wed., and Fri. on 3596 kc. at 1900 EDT. New ECs: SWZ and PS. FLASH: BOK will conduct his old-fashioned Central Maine Ham Meet on Sun., Aug. 15th, at Dexter. SZA is back on 75 meters with an all-new station. EEY has been ill in the Franklin County Memorial Hospital at Farmington and would like to hear from all the gang. YXC, the Presque Isle Fire Chief, is on with a Heathkit and having a "hot" time. A word of caution to the gang regarding signing in to a round table or net: Do not use the phonetics of your call alone without announcing your call. It violates FCC Sec. 12.82. Motorola recently held a communications service meeting in Portland which turned out to be a junior-sized hamfest. Of seventeen present the following twelve hams attended: BOZ, CM, DEO, EBJ, FJP, IKE, IOK, IUM, KEX, QIH, SRX, and TO. Did you see TO on Channel 6 on the c.d. show a while ago? If any of the gang have any old parts or equipment they don't need, please send them to Louis Loud, 688 Plain Street, Brockton, Mass., chairman of the VFW committee to obtain gear for the rehabilitation of war veterans. TWR was tendered a surprise birthday party by members of the Gardiner-Augusta crew. Traffic: W1LKP 129, OHT 119, AFT 35, VYA 35, WTG 30, BTY 27, BX 21, LYR 12, BEU 10, IXC 9, UDD 9, JIS 5, VV 5, FD 4, PTL 3, TGW 1.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — New appointments: As ECs — YHY Fall River, FMH Wayland, MFI Barnstable, PJ Everett. Appointments endorsed: SS Lincoln, BWH Attleboro, MBQ Vineyard Haven, LPM Natick, ICU Amesbury, LLY Arlington, JSM Waltham as ECs; PYM and IKT as ORSs; PXH and JSM as OESs; AYG as OO; AWA as OBS. A new Club has been formed in Scituate, the Satuit Amateur Radio Club, with MB, pres.; JCX, vice-pres.; TMC, secy.-treas, which meets on the 3rd Sat. at the North Scituate Fire House. EAU is living in Rockland. New officers of the Braintree ARC are MPT, pres.; RWY, vice-pres.; CTR, secy.-treas. Heard on 75 meters: EX, MZE, AYO, USA, IPF, VZR, LVV, UOZ. Heard on 10 meters: TXU, 2JAC/MM, QIU, QCS, OLU, UVO, VKE, TBL, mobiles VMU, OZ, GFO. NOV is now Headmaster of the Thomas A. Edison Jr. High School in Boston. If anyone has any ideas for c.d. equipment for 220-Mc. mobile, portable or otherwise, please let me or any member of the Region 5 Comm. know. A Region 5 Radio Comm. meeting was held in Cambridge with DFS, RM, BL, TQP, OTK, IPA, KTG, NJN, and ZYX present. DFS is Alternate Radio Officer for Massachusetts. ISU is on 10 meters in Holbrook. BGW operates mostly on RTTY. The Falmouth Net is active Tue. nights at 7:30 on 3585 kc. VTX has TBS-50 on 10, 75, and 80 meters. YPT and YXJ are on 10-meter mobile with Elmac. An error appeared in May *QST*: YIY was in the hospital and not PWL. LJT has a Viking II. MEG has mobile rig on 75 and 10 meters. The Framingham RC held its annual banquet. UTH won a grid-dip meter at the Worcester Gabfest. BB worked the Clipperton Island Expedition on 80-meter c.w. and 40-meter 'phone. TY is on 80-meter c.w. only. NFE is experimenting on 420 Mc. Sector 5's monthly simulated test was held with a bad fire in Holbrook and with no active hams in the town at the time. Several mobiles moved in. ZWQ had C.D. Director Baker with him and VBB also in that town. Other towns standing by had the following on: CQN, FWS, TYN, QVN, SH, KWD, VPR, MME, and ALP. WFQ had Quincy's Director MacDonald with him. Ex-W1CLF-TV will be active in Norfolk. SW is back on the air with ZFN, K2ADV, 4TTB, 5VNT, and 1ZZB as operators. The Norfolk County RA elected GDY, pres.; HTR, vice-pres.; ALK, secy.; CQN, treas. at its annual banquet. Net certificates have been issued to AF, WSN, 2URX/1, members of the College Net. ICU, Amesbury EC, is Radio Officer and RYJ Alternate Radio Officer. RYJ and QUY are Asst. ECs. ICU moved his station to the Central Fire Station for drills. LJT started up the 10-meter net in Region 6 again and has ULJ as his Asst. EC. A c.d. alert was held in Bedford with the following on: WKM, PWL, MHN, UID, AZY, BMQ, TZU, WGN, CTZ, AGG, WU, and LAZ. WN1AQV is a new ham in Medford. MHL is active at V. F. W. Home in Waltham. MBQ is on 2 meters. Ex-W1IWJ, now 6UGK, visited the club in New Bedford. The New Bedford Emergency Net will operate Sunday A.M. on 29,400 kc. Membership in the SEMARA has doubled since KHV took office as president. UID is busy as secretary. TQS, Provincetown EC, is back to normal and will be active on the air. BHD, Everett EC, reports the following helped out in the recent c.d. test in his city: BHD, PJ, VXE, KNA, YIC, YID, YNF, RLF, HXY, TNI, SXH, TOD, TYM, VN, JTS, KMK, LD, EL, FV, RUG, QEP, HKG, HOH, HYZ, YYJ, DOF, KUC, VLW, IFR, UOC, LLY, VCS, WJR, QXX, CTW, FWQ, PIF, ZWQ, WLV, WFQ, FVD, SPL, YOR, MZF, 5HNL/1, HFJ, DJ, OIR, MQB, NMX, SBT, and BB. DJ and OIR were on 6 meters and in touch with Revere, TOQ. BHD is going to continue as C.D. Radio Officer but will have a new EC. PJ. IBF is editor of the T-9 Radio Club *News*. IPK is foreign correspondent, WNK is secretary. Falmouth Club news: SUE gave a talk and demonstration on s.s.b., a 2-meter antenna has been put up on the Town Hall, UG is home again, 4ZWY/1

(Continued on page 94)

take your pick from the Eimac BIG SIX...

EIMAC BIG SIX:
4-65A,
4-125A,
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4-400A,
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EIMAC Big Six radial-beam power tubes with their six incomparable features have proved the popular choice of amateur radio operators in all types of service. For phone or CW, 160 meters through 2 meters, an Eimac Big Six tube means 1) Low driving power and high power gain 2) Low grid-plate capacitance and low inductance leads 3) Simple circuit needs 4) Easy TVI suppression 5) Pyrovac plate and non-emitting grid wire and 6) Unmatched reliability and performance. To be sure of Eimac quality, ask your distributor for Eimac — the mark of excellence in electron-power tubes for twenty years.

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Eimac TUBES

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has gone to Japan, the Club bought a tape code machine. TVZ will be on from So. Poland, Me. VRW is in the Navy. TZQ is on 220 Mc. WN1AQI is a new ham in Quincy on 80 meters. New officers of the South Shore RC are FWS, pres.; QJK and CTR, vice-pres.; SZV, secy.; TZQ, treas. New officers of Radio Amateur Openhouse Club are TON, chairman; HAS, secy.; OOP, treas. IAE is new EC for Sharon. Traffic: (Apr.) W1UKO 237, EMG 224, EPE 166, UTH 146, MME 120, AVY 112, UE 60, SW 51 VVA 41, LM 38, QLT 20, IBE 18, TY 18, CTR 12, WU 12, LVN 11, BY 10, VMD 7, BB 5, DVS 5, NFE 4, NUP 4, TJW 4, AHP 2, LLY 2, UXG 2, JJY 1. (Mar.) W1UTH 95.

WESTERN MASSACHUSETTS — SCM, Roger E. Corey, W1JYH — SEC: KUE. RM: BVR. PAM: RDR. WMN meets at 7 P.M. EDST Mon. through Fri. on 3560 kc. We welcome new Novices WN1AJX, WN1AOT, and WN1AOU, of Springfield, and WN1ATW, of Longmeadow. ZIO dropped the "N" from his call and is a new OO appointee. JRA is on 2 meters as well as the low frequencies. AAY and KFA are back on the air after long lay-offs. WEF and WDW received 30-w.p.m. stickers this month. BVR and JYH spoke to the HCRC on ARRL organization and administration. Brothers WN1ZPB and WN1AOX are new hams at Amherst. WDW landed an EA1 for his first DX with his 20-meter 35-watter. BDV has his boys working on 2-meter walkie-talkies and is getting his mobile ready for the summer at York, Me. LIB finds that his new job and night school limit his activity to Sun. on 75 meters. WCG topped the section in the April CD Party with TVJ, YCG, JRA, WEF, MNG, RRX, WDW, and JYH also taking part. ECs LPF and LFI got together with VPH and PNZ to form a Clinton emergency net on 10 meters. ALH is the newest Indian Orchard ham and is on 80 meters with 35 watts. NLE has a new 10-meter mobile. OBQ has a new HRO-7. TVJ is up to 47 countries with his HT-20 and lacks only Asia for his WAC. WFL has a 522 on 2 meters. VNE enjoys landscape painting as a second hobby. WN1AJX worked 7 states in his first month on the air with a 616 and a quarter-wave antenna. RB was one of the lucky few to work FO8AJ on Clipperton Island. AVK is active on 20 and 75 meters and 420 Mc. CCH now has f.m. on 2 meters. KFV has a new HQ-140 and received his WNH certificate recently. Traffic: W1TVJ 198, BVR 127, WCG 53, TAY 47, WDW 44, JRA 32, HRC 24, MNG 22, RRW 22, WEF 9, JYH 7, WN1AJX 6, W1LIB 6, VE2AKJ/W1 2, W1OBQ 1.

NEW HAMPSHIRE — SCM, Carroll A. Currier, W1GMH — SEC: BXU. RMs: CRW, TBS. At the writing of this report Cal, our SCM, is back in the hospital and this report has been written by CRW. RBX has completed mobile installation. New ORS are WUU, UEB, and TNO, operator at ET, Hanover. NHN now is on summer sked, Mon., Wed., and Fri., 7 P.M. EDST, 3685 kc. WUU, Goffstown, is the regular outlet for Manchester traffic. ET, TNO as operator, skeds NHN, NHEN, and CPN. UEB is running low power but doing a nice job. QGU is back in New Hampshire for the summer. FZ is doing an FB job with a Viking. The outlet for Nashua traffic is HGV and TA. HGV is publicity handler for the Mike and Key Club. He also operates on 29,680 kc. at 7 P.M. The Mike and Key Club now is running code and theory classes. SAL is working for higher power. CDX, COC, and POK are doing a fine job on NHN. We need more outlets for traffic. If you haven't heard from me regarding ORS appointment, drop me a card and you will receive all the necessary information. Traffic: W1CRW 272, WUU 77, CDX 70, COC 34, ET 20, SAL 10, FZ 9, HGV 4, UEB 4.

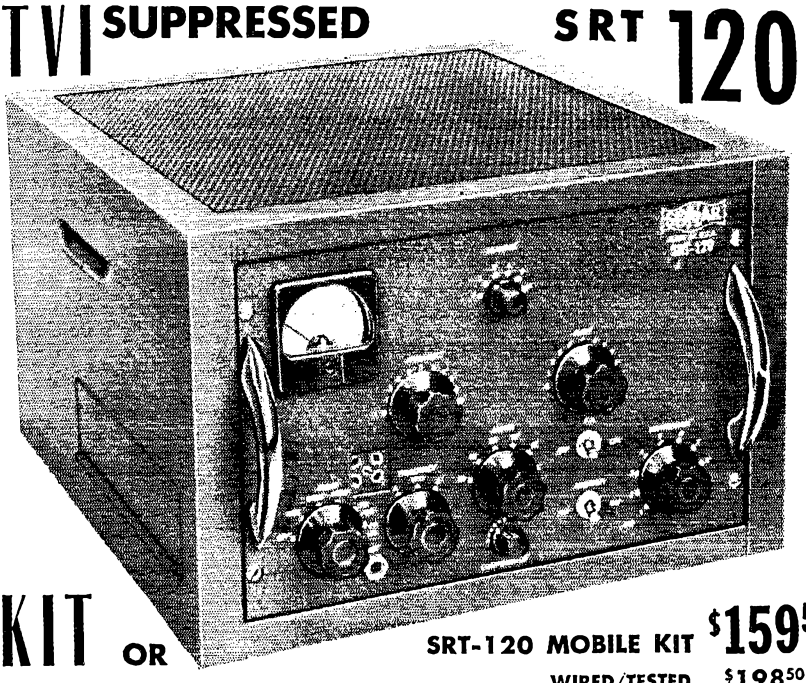
RHODE ISLAND — SCM, Merrill D. Randall, W1JBB — SEC: MIJ. RM: BTV. RIN's summer schedule started May 2nd. The Net now meets on Mon., Wed., and Fri. at 1900 EDST on 3540 kc. The R.I. 'Phone Net meets every Sun. at 1100 EDST on 1890 kc. The date for the next meeting of RIN and RINN is not yet known. Ask BTV for dope on this meeting; it will be of great interest to you! Incidentally, BTV's new code class started April 19th. If you're not in this one, be sure and make one of the succeeding ones 'cause Nick sure knows how to make the learning of the code entertaining as well as educational. We have been wondering why we did not hear last month from one of our most faithful operators, VXC. We just learned that she has been very busy bringing a new jr operator, Keith, into the world! Everybody sends congratulations, June! BBN received his WAN̄E certificate with the splendid "all 67" endorsement. We're still waiting to hear whether his is the first with the 67. Several more endorsements are due. Let's have them, please! Traffic: W1BBN 148, TGD 146, IMY 113, AIT 42, YKQ 30, VXC 10, YAO 10.

VERMONT — SCM, Robert L. Scott, W1RNA — PAM: RPR. RM: OAK. VTN 3520 kc., VTPN 3860 kc., GMN 3860 kc. The Tri-County Amateur Radio Club has a new QTH, CD Hq. Room in the Municipal Bldg., third floor. Meetings are held the 1st Mon. and 3rd Tue. at 2000 hours. Mondays are for club business and Tuesdays are confined to work projects and radio instruction in line with c.d. KOO, Burlington Amateur Radio Club, operated as KOO/1 at Camp Abnaki, North Hero, Vt. during the Third Vt. QSO Party. All reports are not in yet but so far the Party is the largest yet. Scores show that 61 Vermont

(*Continued on page 96*)

PROVEN PERFORMANCE

TVI SUPPRESSED SRT 120



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SRT-120 MOBILE KIT $159.50
WIRED/TESTED $198.50
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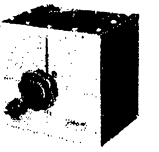
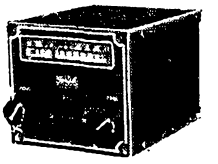
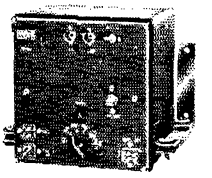


V-120 $19.95



SR-9 $72.45



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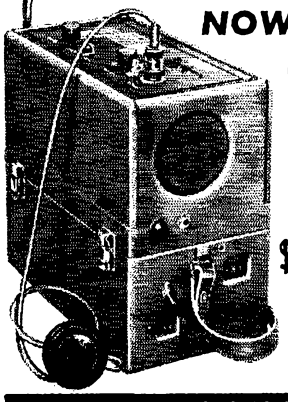

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stations were active and all counties represented, thanks to KOO/1, VVO, EZ, and KJG. W-VT awards sent out to date are No. 1 BFT, No. 2 UET, No. 3 RNA, No. 4 QHH, No. 5 BJP, No. 6 IT, No. 7 EFN. TAN is giving individual instruction to three on General Class license. Traffic: W1RNA 137, OAK 134, JLZ 110, TEW 86, BJP 48, TLI 38, AVP 32, IT 30, VZE 22, TAN 21, KJG 13, VVP 8, FPS 1. (Mar.) W1KJG 8.

NORTHWESTERN DIVISION

ALASKA — SCM, Dave A. Fulton, KL7AGU — ATL has a new antenna, an end-fed Zepp, and also is working on mobile gear. PDG has his new 20-meter beam up and reports good results. AOT also has a new 20-meter beam up and a fine looking job it is. HL is the proud owner of a new 75A-3. It is rumored that the YLs are having a net on 75 meters on Sat. A.M. We have usually found that women like to talk about things they are doing, but if anyone can pry anything out of them on this net, please let us know. Once again it is nearing time for the hamfest. The tentative date and place for the 1954 All-Alaska Hamfest is the week end of Aug. 14th and 15th at Paxsons Lodge. The first RACES authorizations have been received in Anchorage. If interested, contact your local Radio Officer. If in doubt, contact TI, who is Radio Officer for the Territory. ABT has his mobile on the air. The mobile gang really is growing. How about some more?

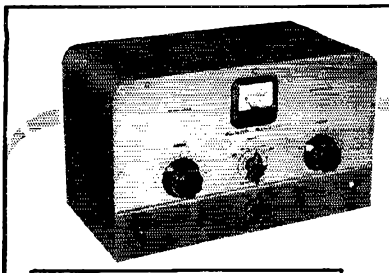
IDAHO — SCM, Alan K. Ross, W7IWU — Caldwell: SAE is just starting a four-year stretch with the Navy. EYR bought a Viking VFO. Kellogg: PTI reports for the Shoshone County Amateur Radio Club. He is president and EC for the area. The Club has 2-meter gear at the CAA station on top of Mullan Pass, also a 500-watt club station, plus three portables, and Elmac A54, and a 750-watt gas generator. Lewiston: IDZ reports an AREC drill was held on 75 meters with three mobiles and one home station participating. GMC returned from a three-year recall hitch with the Navy. OWA schedules 6EBK evenings. ONP and IDZ are getting ready for mobile activity. Preston: RKI is a newly-appointed OO, OBS, and OPS. Boise: The Club is traveling to Anderson Dam on July 11th with HPH as host. All amateurs are invited. JKB, Boise EC, operated on 145.44 Mc. over Field Day from the top of Shafer 7600-foot peak near Boise. Traffic: W7RSP 20, OWA 12, PTI 1.

MONTANA — SCM, Edward G. Brown, W7KGJ — Great Falls Emergency Coördinator DSS reports the May 2nd drill was very successful with 17 stations taking part, 10 mobile units with walkie-talkies and 7 fixed stations. Five mobile units were dispatched to contact Red Cross and c.d. officials and within 30 minutes they were all found and were cruising the city and reporting to CRD, who was Acting NCS. None of the operators was aware the drill was to take place. SMY says that with the help of LBK the 8JK beam was erected and put into operation with very good results. 40-meter signals from W2s were heard loud and strong in mid-afternoon. LBK is installing and servicing TV for a local dealer aside from his regular work. RDM is building a new house. CT has curtailed his NCS activities on RN7 for awhile. CJB is keeping skeds with Lookout Pass on 2 meters, a distance of 70 miles. FIS also is on 2 meters and COH is working on a 2-meter rig. RHB is back on the air at the new QTH. MAK is rebuilding. PCZ has worked OQ5GU and VS9AS and also Pacific and European stations on his 40-meter vertical ground-plane. Traffic: W7SFK 574, PCZ 33, FIS 15.

OREGON — SCM, John M. Carroll, W7BUS — The Cascade Net is growing and will expand further as 10 meters opens up. PRU reports 410 check-ins for the month with 11 NCs and QF as Net Director. QEI and QWE were high men for attendance, with TWM second. SBX reports high convention activity. ECs are requested to send monthly reports direct to ESJ. The Rogue Valley Club reports classes in basic radio with FD as instructor. VCQ is active on 40 meters, and VIL is working Novices on 80 meters. GLK and FRO are putting up FB sky hooks. FUN is having TVI troubles. UVS is a new Novice. QMK is getting ready for portable operation. VGB is teaching the jr. operator to read c.w. EZR wants reports from hams in the Medford Area. EDU is active on OEN. KTL finally is on 40 meters at Albany. FMJ is new Milton-Freewater Area EC. AJN is very active on West Coast nets and has received an honorary membership card from the Washington State Net. PHJ and PRA have applied for ORS appointment. MEZ is an engineer on the Union Pacific. VCH and FLS have their equipment so mixed up that it's hard to determine individual ownership. NFC reports v.h.f. signals are completely lacking at Athena. The Dipsy Net is active again Sunday mornings. OKV was stopped by Washington State Police and asked if the new Oregon ham license plates were real or "phonies." Hillsboro has a local net Wednesday nights at 7:30 on 3.73 Mc. TIR now is mobile with a BC-654. FTU advises from Tripoli that a ham license costs $8.40 U. S. money or three Libyan pounds. Traffic: W7KTG 98, APF 58, AJN 48, TBT 32, PHJ 27, SBX 24, JKU 18, OMO 9, ESJ 7, EDU 1.

WASHINGTON — SCM, Laurence M. Sebring, W7CZY — RMs: FIX, OE, PAMs: EHH, PGY. On. Apr. 2nd the

(*Continued on page 98*)



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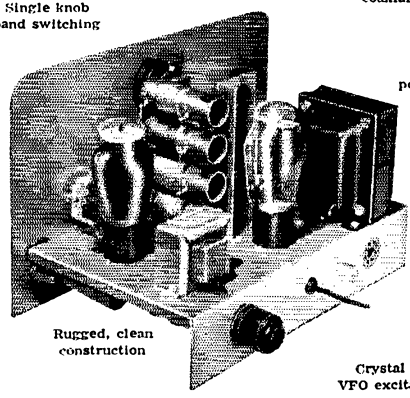

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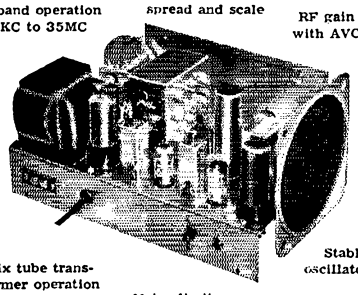

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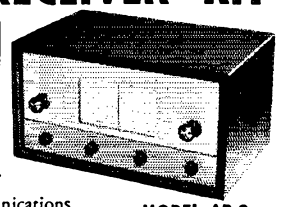

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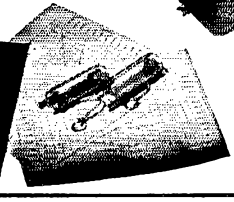

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Tacoma Amateur Radio Society held an election of officers. The following were elected: TJW, pres.; SOI, vice-pres.; GVV, secy.-treas. A joint meeting was held by the Radio Club of Tacoma, the Valley Radio Club, and the Tacoma Amateur Radio Society, with Rex Roberts as principal speaker. He spoke mainly on the doings in the Northwestern Division and at Headquarters. Lewis McCoy, IICP, spoke on the type of work and the different divisions of the Headquarters staff; also the happenings on the TVI front. CWN assisted the West Seattle Radio Club with its radio communications at the outboard races held on the Samamish Slough. OE/7 is trying to keep contact with WSN from motels throughout the 11 Western states with a little BC-474 rig and is doing pretty well at that. UQY and NII have organized a traffic practice net to provide practice for the amateurs around Richland. USO has a new rig — a p.p. 6146, 150 watts, 80 through 10 meters. UMK has orders to report for duty in the Far East. Seattle's North End Club has moved to its own headquarters made available by the Seattle Civil Defense. CBE has built BFO for his mobile rig and converted to all bands. CO has completely rebuilt his shack using acoustic tile. UJA now is on 75-meter 'phone with an 807. HDT is busting with pride over the new Elmac Transciter. ZU visited 1AW on April 14th. He is now on vacation in KH6-Land. PRZ is NCS of the College Net from Cornell U. station, 2CXM, on Wed. nights. Prof. Richard Harbour, of WSC, has been able to reactivate the WSC Radio Club, with an active membership of 10. The newly-elected officers are ULL, pres.; OZX, vice-pres.; Don Kachinsky, secy. K7FBD is on 40- and 80-meter 'phone with VNZ and BKK operating. FIX is your new SCM, so please send your reports to him. Traffic: W7BA 1679, K7FAE 1104, W7PGY 1074, KT 597, SOI 302, HAK 288, UMK 234, K7FDD 129, W7BG 85, APS 78, FIX 76, USO 74, AIB 71, K7FBD 71, W7EHH 56, OEB 52, RXH 49, OE/7 43, QOU 24, ZU 23, BLX 21, HDT 8, AMC 7, GAT 6 NWP 4, UQY 3.

PACIFIC DIVISION

HAWAII — SCM, James E. Keefer, KH6KS — We hear via KH6AJF that the Military has banned single sideband operation in Japan. A number of traffic reports are being received beyond the deadline of the 7th of each month. Push them along via radio and send the confirmation later. BPL was made by KH6FAA, KA2FC, and KA3AC. KA2HQ and KA7RC reported BPL totals for March. Traffic: (Apr.) KH6FAA 2022, KA3AC 1422, KA2FC 1254, KH6AJF 328. (Mar.) KA7RC 862, KA2HQ 751.

NEVADA — SCM, Ray T. Warner, W7JU — SEC: HJ. ECs: KOA, LGS, NRU, NWU, TJY, and ZT. OPS: JUO. ORS: MVP, VIU. With regret we report the passing of Nevada's pioneer ham, W7VO, ex-W6UO. Bert was first licensed in 1920 and was one of the mainstays in AARS activities before the war. He also was ORS, EC for Yerington, RCC and CARS member, and engaged in c.d. activities. Our sympathy goes to JOS, his son. VIU is a new ORS in Elko and has a new Viking II on the air. OXX is following the trout streams with mobile and trailer. VDC is keeping K7FDB, Stead AFB, on the air. UFI, of Las Vegas, is on 75-meter mobile. BKS has moved to a new home in Las Vegas and is considering new antenna problems. BVZ lost no time getting back on 40-meter c.w. after recuperating from an operation. Traffic: K7FDB 259, W7JU 14, MVP 6, VIU 2.

SANTA CLARA VALLEY — SCM, Roy I. Couzin, W6LZL — Plans are well under way for the coming ARRL Pacific Division Convention which will be held in San Jose July 3rd, 4th, and 5th. A wonderful program has been outlined and the prizes are the best ever offered, to my knowledge, at any division hamfest. The dinner is a big steak Bar-B-Q to be held at the county fair grounds. For information or pre-registration tickets drop a line to the SCCARA, P. O. Box 6, San Jose, Calif. Preregistration closes on June 26th. Price of the hamfest is six dollars each. The Mountain View Radio Club elected as officers PUB, pres.; BCD, vice-pres.; TEP, secy.-treas.; CAZ, AFY, and PUJ, board of directors; and KQK, radio officer. Just a word here to say what a wonderful job CAZ did in the initial formulating and in getting the club rolling. As the Club's first president he put a terrific amount of effort, with the help of his fellow officers, into the organization and building of a club that takes a back seat to no other club in the area. It is strong financially and with an amazing amount of fellowship which will carry it a long way. Again I say well done, Lew, it is a pleasure to be called a member. YHM will QRT for the summer while up in KL7-Land. He may get on marine and aeronautical mobile while there. NTQ is putting up a new (no-blow-down) tower. His beam is ready to go up again. MMG is back from W1-Land. AMH and BIX, up north section way, are keeping the 160-meter band busy of late. Traffic: W6YHM 402, UTV 114, FON 80, K6BBD 18, W6AIT 7.

EAST BAY — SCM, Guy Black, W6RLB — Asst. SCMs: Harry Cameron, 6RVC, and Oliver Nelson, 6MXQ. SEC: WGM. RMs: IPW, JOH. PAM: LL. ECs: AKB, CAN, CX, FLT, NNS, QDE, and TCU. About 400 persons heard Lew McCoy of the ARRL Staff present the story on

(*Continued on page 100*)

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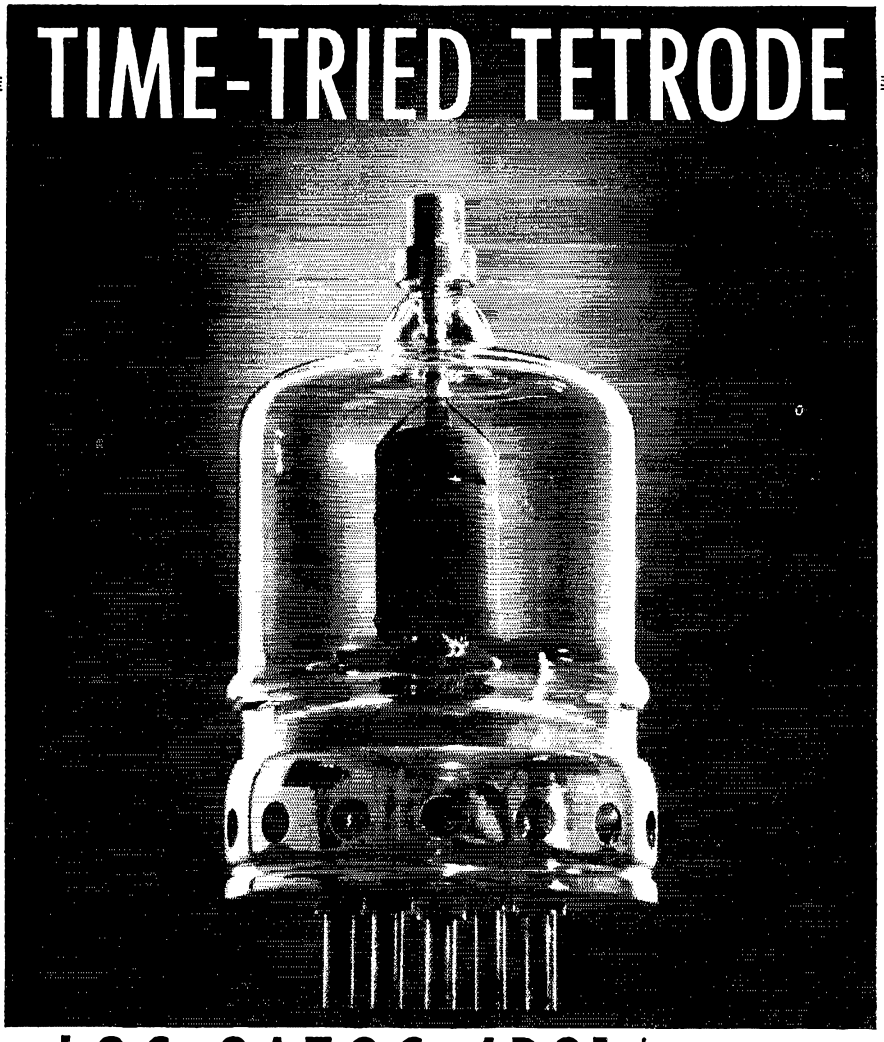
television interference on April 22nd. It was especially encouraging to see so many servicemen in the audience. We know how important it is to us as amateurs and neighbors that servicemen know and tell their customers the real story about the many kinds of interference which plague TV sets. Thanks to the men of the U.C. Amateur Radio Club for their coöperation in making such fine facilities available. Several Bay Area amateurs worked IICP on 2 meters during his short stay here. Incidentally, the U.C. gang has its station, BB, on 20, 10, 2, and ¾ meters. The East Bay gang did well at the Fresno Hamfest. VDR and ZSS came in first and second on the 2-meter transmitter hunt. The Oakland Radio Club had a bang-up barn dance for its May meeting. The Mt. Diablo gang held an auction in April. The gang out that way remains a hotbed of traffic activity, with IPW, BDF, and JUW all setting the pace. Contra Costa Civil Defense has come up with funds to help get some 2-meter equipment started. The 10-meter hidden transmitter hunts have been so successful that more of the gang is getting on 10-meter mobile. Alameda Skyriders and San Francisco 29ers take note. Incidentally, how is the 10-meter gang in Solano County doing these days? The SARO is planning a whole series of 80-meter c.w. hidden transmitter hunts. Fellows who are used to hunting 'phone rigs ought to try the SARO system of 5 minutes on and 10 minutes off some time. The SARO gang visited the Newark Substation of P.G.&E. under the auspices of BV. The Skyriders, who meet on the 4th Sat. night, have new officers as follows: BSY, pres.; ZOZ's XYL, vice-pres.; TM's XYL, secy.; KSP, treas. WSR is getting on 10 meters. YKW is thinking about getting back on the air. VFW is almost completely recovered from his automobile accident. HBF is getting into traffic. QPY likes traffic better and better. Three new Novices in the Concord-Walnut Creek Area are KN6s EBC, ERG, and ERV. Ex-Novice JHV now gets 100 watts out of his 4-65As and works a lot of DX, too, on c.w. EJA was disappointed in the rat-race for FO8AJ. Traffic: K6FDG 2703, W6IPW 234, JOH 67, QPY 17, HBF 10, EJA 2.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC — EC: NL. The SFNSYC was host to the CCRC in April. The meeting was held at the local Red Cross Bldg. The QRM Club was on Diamond Heights on Field Day. The Humboldt Amateur Radio Club reports there are no new calls in the Eureka Area. The Club had a little c.d. drill April 4th. The AREC Net meets every Sun. at 10:30 on 3900 kc. The SCRA meets the 1st Wed. at the County Court House, Santa Rosa. The Marin Amateur Radio Club meets the 2nd Fri. at American Legion Hall, Larkspur. The Tamalpais Radio Club meets the 3rd Fri. of each month. The Mobileers was busy with plans for its June 6th picnic. The SFRC members were hosts to the ARRL TVI Representative, L. G. McCoy, at its April meeting. More than four hundred club members and their friends attended and enjoyed the demonstration. The YLRCSF took over the refreshment committee for the SFRC TVI Demonstration Meeting under the direction of the President, QMO. The Ladies' Club served five hundred cups of coffee plus doughnuts. The Club reports two new calls for the ladies' club, KN6EEV and KN6EEE. KN6EEE makes the Smith family 100 per cent hams, father, mother, and son. The 29ers' monthly hidden transmitter hunts are getting bigger and better each month as the news of the good times the gang has gets around. SFA C.D. meets on 2 meters every Mon. night. KZF, PAM and Mission Trail EC, held an emergency power drill one Sunday A.M. in April with a very good turnout. The Pacific Division Director's Meeting, held by JZ in Berkeley, was attended by the local boys, ATO, FVK, CTH, KZF, CHP, and GGC. Many local hams now are listing their amateur calls in the telephone book so visitors can reach them via landline also if they check the telephone directory. NTU and Marie send regards to all their ham friends. They enjoy Honolulu but miss the old gang. K6BAS now is working at Eitel McCullough, Inc. AJF was heard on the S.F. Section Net. CHP is building the Pi Network Amplifier as printed in May *QST*. NL, the SEC, now has allocated funds to purchase c.d. equipment for the SFAREC. OXL is putting up a vertical for low frequency and finished a 350-watt rig, all bands, a pair of 813s in the final. Congratulations to UEV and Ann on the birth of a daughter on Apr. 23rd. EJY is back at mobile radio again after parting with his motorized roller skate. TMF is doing a fine job on Guam 'phone patches. NAC has moved to San Anselmo for the summer. URA is treasurer of the Cub Scout Pack, his district. CTH has new commercial "dogproof" all-band antenna-tuning unit. PHF and EYY have new mobile receivers. PKI is selling all his ham gear. Congratulations to PHT, SWP, K6FCT, and GQY on making BPL for April. GQA, OO, reports he is getting around now. Polio got him down but he doesn,t need a wheel chair now. Al asks the boys to watch the emission VFO third harmonics on 5.4 Mc. when operating 40-meter 'phone. The FCC is cracking down on harmonic interference to aviation services in this frequency range. K6FCT has a daily sked with KA2LK s.s.b. for traffic. Traffic: K6FCT 1310, W6SWP 1188, GQY 715, PHT 449, K6NCG 232, W6QMO 183, GGC 24, YC 7, UOM/6 6.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — First of all, gang, if we are going to continue to

(*Continued on page 102*)

TIME-TRIED TETRODE



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have a large news section we are going to have to increase our membership to twice the present size. With the present membership we are entitled to only 26 lines, so what's the answer? That's up to you fellows, especially the ones who are plugging for a division in the Sacramento Valley section. Let's hear from some of you fellows. K6BDI and W6SBH attended the ARRL meet in San Francisco. The Tehama Club is growing and the members are really showing that they mean business. They are wonderful fellows. ICZ now is a married man. KN6ESK is the newest ham in Chico. MWR is a new OPS. CIS has been in San Francisco but got into the CD Party. Hope all your contacts were pleasant, Ken. We have lost a very able man, IEO, who has moved to Portland, Ore. The RM is OPY, of Sacramento, and I hope that you will give him your full coöperation with the new net. I see that REF has moved to Rio Linda. What's the dope, Betty? The City of Sacramento is purchasing some equipment for c.d. work. A CPX was held on May 25th, using 3.9, 28, and 144 Mc. The Sacramento C.D. Net meets on Tuesdays at 2000 on 3885 kc., with 82 in the roll call. Their RACES plan is in the works and will soon be in the hands of FCDA and FCC for approval. Hidden transmitter hunts are held Wednesdays on 28.8 Mc. Thanks to SEC JEQ for the above dope. Would like to have all gripes or any constructive suggestions in to the SCM or the Director so that we can go over things before the meeting on July 3-4-5 (ARRL in San Jose). Let us know your wants so that we can act. JDN has been very much on the run for the past several weeks so hasn't been able to do much traffic work, but hopes to be on more soon. Traffic: W6IEO 200, REF 150, JDN 10, MWR 10.

SAN JOAQUIN VALLEY — SCM, Edward L. Bewley, W6GIW — SEC: KRO. RM: OPU. PAM: ZRJ. Sixty members and guests of the Stockton Club listened to a talk and demonstration on the Johnson Viking and associated equipment given by K6BRO, W6CGG, and DUB. A Signal Sentry door prize was won by CPT. Out-of-town mobiles were guided to the meeting place by DVI. Region 4 Command Performance Exercise proved successful with the headquarters station at COP operated by the following: RLG, OXB, VKD, MYP, OSX, DBH, and K6ECH. Portable and mobile stations covering San Joaquin County were IAZ, BCL, GQZ, NNG, EXH, NQC, OEV, LRS, PJF, AFS, ZNL, and K6BP. Tuolumne County was covered by CQI, KUY, KLJ, and EBL. WBZ is one more s.s.b. convert. UWY has 1st-class telephone ticket. A meeting of single sidebanders was held Apr. 3rd at Fresno with 42 amateurs present. Technical talks were presented by EAV and JPU. Most activity in the Fresno Area was confined to hamfest preparations. OPU, our RM, reports that SJVN needs more members. The three largest cities in our section, Bakersfield, Fresno, and Stockton, do not have regular representation on the net. Check in with Ray at 1900 PDT, Mon. through Fri. SJVN is a member of the National Traffic System and is an excellent outlet for your messages. Traffic: (Apr.) W6OPU 63, GQZ 32, SJJ 24, EBL 21, EXH 17, GIW 16, K6BGM 11, W6ZRJ 6. (Mar.) W6EXH 23.

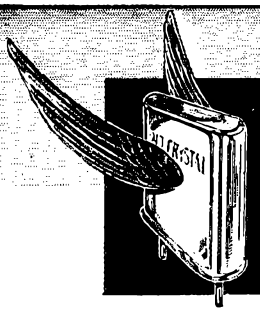
ROANOKE DIVISION

NORTH CAROLINA — SCM, J. C. Geaslen, W4DLX — In the absence of reports through DLX, Headquarters prints these items sent in direct. SOD has his application in with the SCM for OES appointment. WYA reports that the Charlotte fellows have organized a club, the Tar Heel Teen Radio Club. Working on 3885 kc., the members meet at times designated. Teen-age amateurs who work on 75-meter 'phone, especially those locally desiring full membership, may join by contacting Tally Simpson, BUA, 1328 Greenwood Cliff, Charlotte, N. C.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — AUL, Florence EC, reports that AUL, ULH, and LXX assisted with their emergency mobile rigs in rescue work after a plane crash on Apr. 18th and received a letter of appreciation from the C.A.A. DXW reports further from the Florence group that a group of mobiles were alerted and stood by to assist after a serious train wreck several weeks later. FM took his new portable 75-watter to Alabama on his vacation and reports many successful contacts. ZIZ reports into the 4th Regional Net and the Early Bird Net on c.w. YOS reports a successful exhibition of ham radio at the Clemson College Agricultural Fair on Apr. 24th with YOS and 1NMK/4 operating. FFH has a new three-element 20-meter beam. Your SCM attended a Director-SCM meeting in Danville, Va., on May 1st. The S.C. mobile roundup meets at 2 P.M. Sun. on 3930 kc. with HDR assisting as Net Control. Fixed stations are requested to stand by to give mobiles reports and to relay messages from the mobiles. The Charleston group held a ham picnic on the 1000-foot Isle of Palm pier on May 30th. TTG reports an organizational meeting of the Aiken Radio Club with 23 charter members. ZQS is a new member. ZVY: NQP, and TTG were on the Field Day committee. Traffic, W4ANK 133, FFH 46, YOS 37, ZIZ 17, FM 4.

VIRGINIA — SCM, John Carl Morgan, W4KX — BLR, the XYL of BVB, was high Novice in the SS. She now is General Class. New "femme" hams in Richmond: WN4EXS and 16-year-old ZFF, the daughter of ZVE. Asst. Directors ACY, AKN, ANK, FJ, KX, NV, and ZG met with Direc-

(Continued on page 104)



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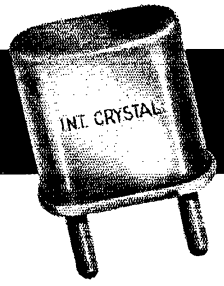

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(fits same socket as FT-243)

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tor MWH May 1st in Danville. The SVARC had another successful Apple Blossom Festival booth. OWV reports on the CVARC's fine job in helping the Staunton Lions Club on the broom sale. Five mobiles operated by TLK, WYC, TDU, VPU, RDJ, THG, and WUQ were directed from fixed station FZG, assisted by LTM. The Tidewater Mobile Club assisted police during the Azalea Festival and will join the Peninsula ARC to cover the Outboard Boat Races from Norfolk to Jamestown from radio-equipped boats. The Club also staged an emergency drill in conjunction with a talk by YAE to the Norfolk Civic Club. The Norfolk Naval Shipyard RC is becoming traffic-minded. New ORS: AMZ, IF. New OPS: YVG, VYZ, VPU, WDZ says the Teen-Age Net "flubbed." Newest "squirts" reporting: WNs DNB and DNC, age 12 and 13, in Virginia Beach. VPU earned a fine scholarship at the U. of Va. building an electronic computer and credits his ham experience. KX has a modulator, the first since 1927, and enjoyed a fine dinner meeting with the Falls Church Club, also attended by FCC Chairman Hyde. ZFV reports running an 8-watter with inside antenna and visits PXA for Sun. MARS Net. RJW is home only week ends but keeps mobile hot. LJE is handling heavy 'phone-patch skeds. VYZ is going heavy for traffic. VAS is building a summer shack at Sand Bridge Beach. JUJ regrets that QRM was less during the April CD as LK was in the hospital. A reminder: When one member of a family is an ARRL member, another at the same address may be a Full Member for one buck. The SVARC is planning its Annual Dickey Ridge Fest for Aug. 1st. Traffic: W4KRR 263, RJW 83, VYZ 74, YVG 47, YZC 41, KX 39, SVG 38, UHG 26, TYC 17, SPE 14, BLR 13, LW 13, IF 7, LJE 7.

WEST VIRGINIA — SCM, Albert H. Hix, W8PQQ — SEC: YPR. PAM: FGL. RMs: DFC, AUJ, GBF, and HZA. FUM has been QRL getting gear ready for the 50-Mc. C.D. Net for his county. LSJ, HRU, and FUM are on 50 Mc. and IEQ, AHF, GQJ, DIT, and FZR will be on soon. The MARA did a good job in demonstrating amateur radio at the Fairmont Hobby Show. The club station, SP, handled 228 messages. The following are results of the 1954 West Virginia QSO Party sponsored by the MARA: 1st prize MBA, score 88; second prize GGC, score 48; third prize 3VKD (ex-W8CMZ), score 32; and GBF fourth prize, score 20. The estimated number of participating stations was 60. HZA worked VK1AC on Macquaire Island on 7 Mc. He is acting as NCS for Trunk Line UTL on Friday nights. PRM, operator at DL4AIR, expects to be released from active duty in August and will return to Bridgeport. The MARA members toured the New Fairmont TV station recently. LSG has a new 75A-3 receiver on order. Congratulations are in order to members of the W. Va. 'Phone Net for doing a fine job this year. It is hoped that the 'phone net will be even more efficient next year. Traffic: W8HZH 69, GEP 62, HZA 53, DFC 15, IXG 14, JWX 10.

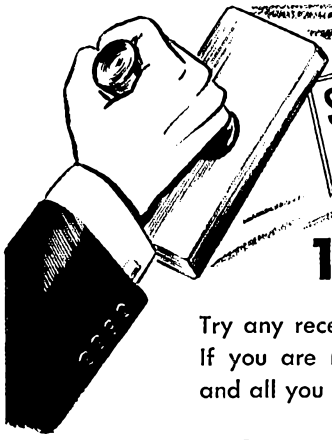
ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Karl Brueggeman, WØCDX — SEC: MMT. The Denver Amateur Radio Net participated in the last Cerebral Palsy Telethon by using the mobiles to collect the donations. A link was set up between the telethon headquarters and NCS and the mobiles. About 50 Denver hams helped out and collected about $13,600. All messages were handled formally and WØLO/Ø made BPL with 338 originations. Congratulations to the Alamosa gang and OGI, THZ, and OXS on obtaining their Conditional Class licenses and WNØTMR, WNØTMP, WNØTMM, WNØTNJ, WNØTNQ, WNØTML, and WNØTMO on their Novice tickets. WNØOXR and his XYL, KQD, now have a new QTH. OHB has a new kw. using p.p. 304TLs. K6DUD, ex-WØOBP, now is in Mt. View, Calif., and wants some news from the Denver gang. How about it, fellows, some cards please. KHQ will not be working traffic this summer. Orval has lots of work to do on the QTH and rig. IA reports no MARS activity at night and wants all MARS stations to report in on the evening-assigned frequencies. The Ft. Collins gang has organized a new club and is becoming affiliated with the local c.d. group. Our new SEC, MMT, sparkplugged this. Thanks, Marie. RTA recently hit the big time by checking into both PAN and TEN. The summer doldrums are now upon us so we'll probably not get too much news. Let's make it different this year and keep the cards and club news coming in. Traffic: WØKHQ 858, LO/Ø 338, RTA 270, IA 17.

UTAH — SCM, Floyd L. Hinshaw, W7UTM — NVY and 6MGF/7 worked 5 states on 160-meter mobile from atop Ensign Peak in just 2 hours! SP has completed his 19-tube communications receiver and seems thoroughly satisfied. RCP reports the Utah Aggie Engineering demonstration a whopping big success, with even a 9000-Mc. station in operation. OQD is a newcomer on 2 meters but operates like an O.T. NMK has a new Gonset Communicator on the seat of his car and says he has a "porous Buick" from the results he has been getting. So far, the Ogden, Provo, and Salt Lake City Nets are the only ones licensed in RACES in Utah. DCS stations have been heard in Price, Utah, using c.w., which indicates c.w. should be used for inter-city liaison with 'phone reserved to local and "scene of disaster" services. Traffic: W7UTM 7.

(Continued on page 106)

YOU GET



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10 day trial

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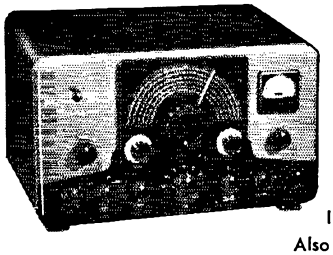

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Transmitter Exciter Kit
Less tubes
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Built-in VFO — TVI Suppressed — Band-switching —seven bands—75 Watts CW Input — 65 Watts phone input. Offers more features than any Transmitter/Exciter ever built for amateurs!

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15.00 Down
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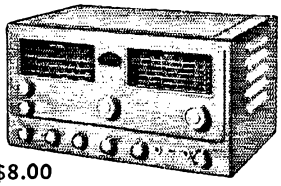

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Morrow 5BR..... 74.95	National NC88...119.95	Gonset Super-6... 52.50
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SOUTHEASTERN DIVISION

ALABAMA — SCM, Joe A. Shannon, W4MI — We have a new club in Sylacauga, the Coosa Valley Amateur Radio Club, with DZF, pres.; YCO, vice-pres.; BAI, secy.-treas.; ZSG, act. mgr. ARR has done it again, this time by winning the YL-OM contest (OM portion)! The Gadsden Club now is in new quarters, Riverside Park, and boasts 21 members. The Skywave Club in Birmingham reports that a 4th call area capital city contest was won by ZRZ, who worked the most capitals. The trophy was donated by CWO. The Tri-Cities clubs have formed a hamfest association with MKV, pres.; TKL, vice-pres.; WAZ, vice-pres.; DGN, secy.; MEM, treas. The three clubs will rotate annual hamfests, the first to be held in Decatur Aug. 28–29. WOO and WOG did well in the SS and WOG reports a new "fish-pole" beam which cost exactly a dollar sixty-five! VE3OJ reports good results on 20-meter mobile with a new Elmac. WN4FEF is new in Ft. Payne and AAN is a new XYL in Mobile. KNW has remodeled the shack and added new antenna. UEI is sporting a new rig. Traffic: (Apr.) W4WOG 107, KIX 83, RNX 61, DXB 52, EJZ 36, BJL 29, USM 29, AZX 25, EBD 23, TKL 20, TXO 20, CRY 19, MEM 4, OAO 3, RTQ 1. (Mar.) W4UJJ 99, WOG 57, USM 36, YNG 22, YRO 21, PWS 18, OAO 10, AZX 9, VE3OJ 7. (Feb.) W4KIX 143, UJJ 142.

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — We are deeply saddened by the death on Apr. 15th of PMN, brother of OZC. At this writing everyone is awaiting operation JOCO. Congrats to IM and the gang on a well-planned job. Bradenton: TAS got QSL from I1APA and PY7HN (40-meter c.w.). Fort Lauderdale: Club station AB is in new quarters. Details were worked out by BMR, FNR, and VCQ. ZQQ and ZUJ got General Class licenses. PPR is in charge of c.d. affairs. JVF finished the 813 final. University of Fla.: OGI reports club station DFU cleared 186 messages at Engineers Fair with TJU, TKD, OWX, OGI, ZDF, WEM, and 1TPU as operators. Holly Hill: AYD says DKY got his General Class license and FXH is at Patrick. Jacksonville: CEF at Jax-NAS got Extra First license. The JARS, under UHY, had overseas traffic station downtown for Armed Forces Day. The supplemental technical club sessions at ZJ's shop are going over big. Visitors were ØRV and XYL ØZER. Our EC, UHY, has been appointed State Civil Defense Communications Officer. Key West: AREC leaders are 3YHO, RNV, EJD, and ZBF. AQJ uses an Elmac. Welcome to WN4DKH. YLB (Navy Hobby Shop) uses a Viking. Lakeland: VIE reports an 11-year-old youngster and his Mom passed the Novice exam as a result of the Club classes. BJI is NCS of the local c.w. net on 14,080 kc. Lake City: YNM is a new EC. Miami: AWR, the son of IEH, got his General Class license. The Dade Club got its QSLs from F.P.&L. Co. PQ is on s.s.b. with 10A exciter to 811 linear, MIE is s.s.b. with home-rolled crystal-filter exciter to 813 Class A. NQN is doing well with 20-meter MINI beam. NJM won the last Flamingo hidden transmitter hunt. IYT reports 21 new AREC members in April! St. Petersburg: The Club had a demonstration of the Tinker Toy method of receiver construction. KHO is using new B & W transmitter. TDK worked SHAPE. WME and BIL use a Hammarlund transmitter, WMC has a Viking, WPF has a Gonset. Traffic: (Apr.) W4PJU 2002, LAP 229, DRD 213, DFU 186, DVR 166, LMT 101, IYT 64, WEO 61, WS 54, TJU 37, VIE 26, TWR 9, AYD 8, FWZ 8, WEM 4. (Mar.) W4DRD 125.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/W4RE — SEC: PLE. PLE sends an FB report on AREC activities. CCY and UCY are pushing AREC in the Pensacola Area. Nightly 29-Mc. drills are being held and UUF is pushing a 144-Mc. net. HJA has new mobile gear installed. ZUN keeps 75 meters hot at night. ZFL is considering a ground-plane antenna. MUX keeps the 32V-2 hot. PQW is experimenting with mobile gear. AXP has personal QSOs with the gang on Saturdays. DAO has nearly completed the stand-by receiver. MS is dividing his time between the ham TV camera and State Civil Defense work. CDE is making an appearance after so many years. QK is perking up again. VR keeps early skeds at WCOA. GRO has an FB new antenna for 75 meters. VFJ is getting a license for the Pensacola H.S. Radio Club. YRF is increasing power. OWN is seen sporting a mobile whip on the car. ACB is working c.d. in the Tallahassee Area. BFD has shifted to 75 meters in the wee ama' hours. SOQ gave the rig a workout during his leave. UHH prefers 40 meters. If interested in AREC and c.d., please contact the SCM. Traffic: W4MS 8, DAO 4.

GEORGIA — SCM, George W. Parker, W4NS — SEC: MZO. PAM: LXE. RM: MTS. Nets (GCEN) 3995 kc. at 0830 Sun., and 1900 Tue. and Thurs.; Mobile round-up Sun. at 1300. YUM is NCS for new Dixie C.W. Net (DN). This slow-speed traffic net meets Sun. at 2000 and Mon., Wed., and Fri. at 2030 on 3590 kc. YEK is new XYL General Class in Atlanta. JEL, ex-6OEJ, is a new YL addition in Atlanta. CGQ is on 75 meters from Griffin with 50 watts. The gang at the telephone company have organized the Bell System Amateur Radio Club with KXT, pres.; TCI, vice-pres.; NNO, secy.; CR, treas. DXM is back on the air after 13 years. The Confederate Signal Corps has a new club house. YUM is building a 10 meter beam. CAZ

(*Continued on page 108*)

HARVEY ALWAYS HAS IT...IN STOCK For IMMEDIATE DELIVERY

The New GONSET COMMUNICATOR II

Built-in Adjustable Squelch and Ear-Phone Jack

An improved model of the popular Communicator, 2-meter station. Cabinet modified to include ventilating screens. Ideal for CD work because of squelch and automatic speaker muting when phones are plugged in. Has receiver dial light, on/off switch and built-in speaker, noise limiter and 19" whip. Takes crystal or carbon mike. Crystal control.

Complete with tubes (less crystal and mike)..... **$229.50**

Mobile Receiver GONSET SUPER-CEIVER

Uses any converter as a tuning head. Employs crystal-controlled first IF and dual conversion to 265 kc. Adjustable-pitch BFO; AF, RF and AVC controls; built-in noise clipper and squelch; built-in PM speaker. Furnished with convertible (dual) 6-12 volt pack and tubes.

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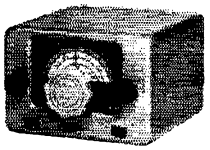
GONSET "SUPER 6"

Six Band Amateur Converter



A compact converter covering 10, 11, 15, 20, 40, and 75 meter phone bands. Also covers 6 mc. (49 meter) and 15 mc. (19 meter) short wave broadcast bands. Uses 6CB6 low noise rf stage, with panel controlled antenna trimmer, 6AT6 triode mixer, 6C4 modified Clapp oscillator, and 6BH6 IF stage.

Complete with Tubes..... **$52.50**

MORROW CONVERTERS Series 5BR

These converters tune the 75, 40, 20, 15, and 10 meter bands. Available in 3 models as listed below.

5BR-1 with built-in noise limiter... **$74.95**
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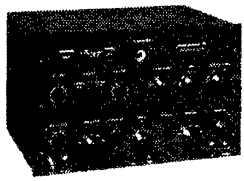
MORROW RECEIVER Model FTR

A fixed tuned receiver of excellent selectivity and stability. Features the new Morrow noise balanced squelch circuit.

Complete with power supply..... **$128.40**



New CENTRAL ELECTRONICS

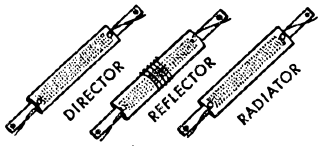
Model 20 A Multiphase Bandswitching SSB Exciter

Has new performance features, plus the proven characteristics of the popular Model 10A. 20 watts peak output — SSB, AM, PM, CW..... **$249.50**
In Kit Form..... **199.50**

MULTIPHASE EXCITER 10B—10 watts peak output—SSB, AM, PM, CW. **179.50**
In Kit Form..... **129.50**

SIDEBAND SLICER—An SSB adapter that will improve any receiver..... **74.50**

New MOSLEY LOADING COILS For V-P Beam



Set consists of 3 coils (reflector, director, and radiator) wound on ¾" styrene bars, fully weather-protected. Radiator coil includes 5-turn link for 52-ohm coax line. Greatly reduce space requirements for 20-meter beam or convert your 10-meter beam to 20-meter operation.

Coils were developed by WØQFG and WØVZC, and were described in QST, May 1954. Designed for use with ⅞" OD aluminum tubing with .058" wall thickness. Ready to install.

Complete Set VP-20-3..... **$24.95**

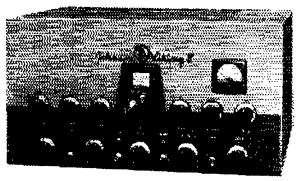
New JOHNSON 'WHIPLOAD-6'

Mobile Loading Coil

A bandswitching mobile antenna coil providing high efficiency base loading with instant coverage on 6 bands. Can be used with any transmitter having up to 75 watts input. A simple, built-in bandswitch selects any band: 75, 40, 20, 15, or 11-10 meters. May be used with Johnson Bi-Net for automatic switching on 10 and 20 meters and bandswitching coverage on the other bands.

Whipload-6 No. 250-26..... **$19.50**

New JOHNSON VIKING II-CD TRANSMITTER



The Johnson Viking II-CD Transmitter has been specifically designed to meet the requirements as set forth in the FCDA Contributions Manual M 25-1 Revised. This transmitter qualifies for the matching funds program, has ben certified to FCDA and is listed by that agency in Issue No. 1 of list of Certified Radio Equipment. It is now available for Civil Defense use.

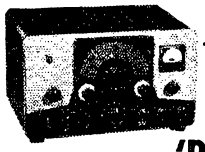
The II-CD is basically the standard Viking II with the following modifications: Cadmium plated cabinet . . . Modulation limiting system to prevent overmodulation . . . Push-to-talk circuit . . . Continuous coverage from 1.75mc to 4.0mc as per FCDA specifications. The complete ranges are: 1.75mc to 4.0mc, 5.2mc to 8.0mc, 9.8mc to 15.0mc, 15.0mc to 21.8mc, and 21.0mc to 30.0mc.

The Viking II-CD is not furnished in kit form and is available only factory assembled, wired, and tested.

Viking II-CD Transmitter No. 240-102-15, complete with tubes, less crystals, key and microphone **$398.00**

Low Pass Filter No. 250-20 required as certified in FCDA Contribution Manual M 25-1 revised..... **13.50**

'Matchbox' Antenna Coupler No. 250-25 required for operation above 7mc and specifically for range from 28 to 30mc **49.85**



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now is mobile on 75 and 10 meters. TGO is being transferred to Hartford. LNG is on 2 meters in Huntsville, Ala., and K4WAR has a 2-meter rig on the air. Both are looking for contacts. The Augusta 10-meter net meets Mon. at 1830 on 28.8 Mc. New appointments: AWO as OPS and ORS. MZO is our new SEC. All ECs are reminded to send him monthly reports at 1084 Berkshire Road, N.E., Atlanta. The Cedar Valley Club now has emergency power and a call, CMA. DNT is a new ham in Cedartown. ZD was accompanied to Denver by LXE, KL, and "Red." They traveled in LXE's new Cadillac. Anyone interested in appointments is invited to contact the SCM. More ECs are needed. If interested, contact MZO. Traffic: (Apr.) K4WAR 1495, W4USA 1386, OCG 393, K4WPB 209, W4IMQ 169, ACH 162, ZWT 157, FOE 152, MTS 38, CAZ 20, YUM 20, NS 12, MA 10, AWO 8. (Mar.) K4WBP 505.

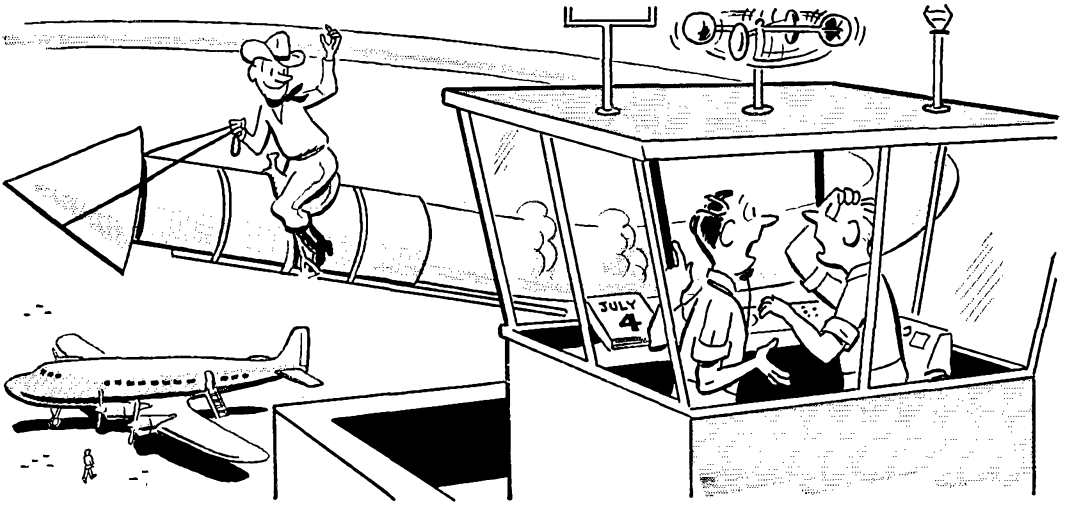
WEST INDIES — SCM, William Werner, KP4DJ — SEC: HZ, OS, Aguadilla EC, signed up RO, VK, and WQ in the AREC. ID, AREC NCS, received WPR-25 certificate. New officers of PRARC are RK, pres.; RD, vice-pres.; PT, secy.; CY, treas.; ML, MV, PW, TO, and RM, directors. JA won an Elmac Transciter at the hamfest. W2APF attended the PRARC Hamfest. BI and CO operated portable from Mona Island as part of a scientific expedition. KD has only 20- and 40-meter antennas up at new QTH. SK put up an 80-meter center-fed antenna. TZ operated from WAB while in Ft. Brooke Hospital. Roberta, WP4YY, uses a Viking II mostly on 15 meters. Martha, TO's XYL, passed the Novice Class exam. TP now is W4FLM and his XYL, ex-YS, is W4FLO. W4ATC/YUW, ex-KP4OD, reports to the AREC Net from N.C. State College. WP4WD now is KP4. ZN, the first station in Carolina since ex-Governor Pinero had a station there, is using a Viking II with beams for 15 and 20 meters. CC, JE, TA, and TF worked FO8AJ. HZ installed a Heathkit as mobile rig in the car. DL/mobile is very active on 75 meters. UW is using low power while rebuilding the final. KV4AA advises the Antilles Net meets daily at 12:30 P.M. AST on 7206 kc. FI, at Mayaguez, has a kw. on 75 meters. Traffic: KP4DV 3, DJ 2.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W6YVJ — Asst. SCM: William C. Coe, 6KWQ. SEC: QJW. RMs: 6BHG and GJP. PAM: PIB. A traffic breakfast, a meeting of SCMs called by Director Griggs, KW, at his home, and an excellent display in our section of TVI problems and answers by IICP, of Hq., highlighted the month of April. Long Beach put on a hobby show with K6EA in attendance, and Beverly Hills did the same as reported by NJU. Santa Monica Fair traffic tied up a lot of channels and PZN made OPS. SQY, NJU and TJL, under the call K6BAG, ran the "Hills" show. SQY tells us that the teen-age net no longer meets. GJP and others are working up a Pacific Coast Net for better overseas traffic-handling. AM worked FO8AJ on 4 c.w. bands and 2 'phone bands, and calls this his No. 245. GYH is checking in MTN on 2 meters regularly. NIE has an all-band 50-watt mobile rig installed. BUK is mobile with an Elmac AF67 and Gonset converter. HOW also is using an Elmac rig. He reports that the West Valley Club is now K6DTA, with W6ARO as trustee. Ex-W6KJC, now 9AMF/6, is back with the group after 6 months in Illinois. The Club assisted Reseda in the Cancer Drive April 3rd. K6BEQ is completely "push-to-talk." ISQ is moving out of the section to Ventura. The Foothill Radio Club (Hollywood High School) is QZT with 200 watts on 75 and 20 meters. Officers are KN6CEO, pres.; CBZ, vice-pres.; and NJU, secy.-treas. LVQ reports that BLY is on the mend after an operation. FGC has deserted s.s.b. for the Green-Eyed Monster Clan. EYP is back on 20-meter c.w. YSK, who "usually makes FMTs," says his XYL is KN6EIA on 2 meters. BES is all-band mobile with 40 watts. Fabulous ZDO has mobile equipment on almost as many bands as the FCC will allow, including 170 watts on 2 meters. He brags about receiving S-8 from Mexico while mobile in Chatsworth and has a 420-Mc. dipole 75 feet up now. QJW reports the Cancer Group was aided by amateurs of Inglewood and the Los Angeles City RACES group, for which the Cancer Society expressed its gratitude. The Inyo County gang placed its CPX efforts on tape to check on operations and Howard wants to give the group a well-earned pat on the back for it. L.A. Area "A" now has RACES status and full credit is due AEJ and his staff. KOS has gone to Alaska for a month. JHZ is mobile on all bands with a Destron rig and a Gonset. K6/KN6DWA is a new ham in the Aerojet Club. PQH worked his first ZL recently. ZXH took care of a TVI complaint for the club as requested by FCC. Traffic: (Apr.) K6FCZ 1103, W6LYG 895, BHG 194, PZN 160, K6EA 149, K6BAG 102, W6NJU 100, W6USY 88, CMN 83, GJP 82, LDR 67, JQB 37, GYH 35, MBA 22, SQY 22, NIE 19, NTN 10, AM 8, HIF 8. (Mar.) W6ISQ 94, MBA 66, GYH 20.

ARIZONA — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; Dr. John A. Stewart, 7SX. SEC: OIF. PAM: KOY. Arizona 'Phone Net: Tue. and Thurs. 7 P.M., 3865 kc. Note: Arizona C.W. Net has been changed to Tue. and Thurs. 8 P.M., 3690 kc. Arizona Novice Net: Tue. and Thurs. 6 P.M., 3704 kc. Because of

(*Continued on page 110*)



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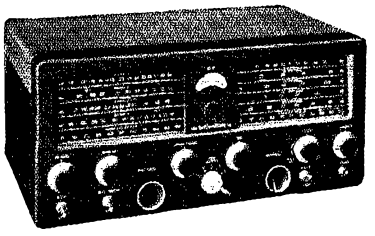

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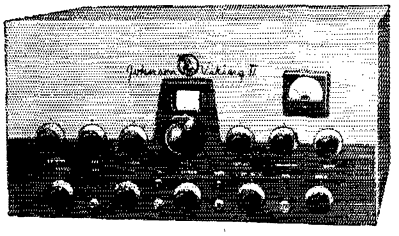

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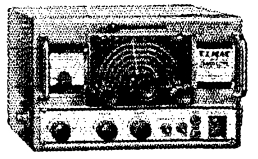

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the lack of reports from appointees and others, there apparently was little activity around the State during April. However, congratulations go to Phil Schaefer, VIG, who got his Extra Class license. That makes 3 Extras in Arizona. New OO appointees are LAD and SUI. There are several new calls around the State, including SAN from Colorado. VXG from Illinois, and VZG from Czechoslovakia. RUX is aeronautical mobile and MII and UCX have new mobiles on 80 meters. QHD got 2nd-class telephone license. VZJ and UYE are now General Class, VYW and VYX are new Novices, and VAG got his Technician Class license. LAD is now the new EC for Tucson and vicinity. Traffic: W4LAD 65, KOY 64, LVR 36, K7NRZ 7, W7RUX 7.

SAN DIEGO — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU; Shelley Trotter, 6BAM; Dick Huddleston, 6DLN. SEC: VFT. ECs: KUU, FJH, QJH, HRI, DEY, WYA, IBS, BZC, KSI, DLN, HFQ, BAO. PAM: JPM. RM: ELQ. GHT now is mobile on 10, 20, and 40 meters. BAO is EC for La Mesa. We hate to lose K6DY, our EC for San Diego City, but wish him good luck in Florida. The county c.d. drill held in April proved how amateur radio can be coördinated over an entire area. More than 60 mobile and fixed stations and operators participated. K6DNO, CTQ, and BPI have dropped the "N" from their calls. KVB did a good job sending Mother's Day messages for servicemen in the area. SAK now is with USN. The Orange County Club enjoyed the illustrated talk given by ZL2RC. KEO is heading for Hawaii. NZP is back on the air after an African safari with her OM. AWI, DXI, KN6DRZ, and KN6EJE make up an all-ham family. CGQ, the 40-meter beam expert, has been transferred to Vallejo and will be missed by the San Diego group. Among those working FO8AJ on Clipperton were CGQ, KYG, CAE, CHV, and LRU. IAB continues to lead the section in traffic, doing a fine job. GJX, a YL, joined the Navy recently. Activities in Imperial County continue to grow by leaps and bounds on all bands. K6BEC is president of a new club made up of licensed operators from Pt. Loma High School and Dana Jr. High. They meet twice a month and it looks like they will go places. WNN is looking for 420-Mc. contacts in the area. K6BPI is the new OBS for the 2-meter AREC Net. The SCM welcomes news from anyone in the section prior to the 7th of each month. Traffic: W6IAB 3753, ELQ 628, IZG 321, FCT 35, KVB 16, CRT 8.

SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — QIW's activity on three nets led the section in traffic for the month; K6NBI was a close second. FYW has moved into his newly-completed home. BRY is the new president of the Paso Robles Radio Club. Congratulations to his brother, K6END, Paso Robles' newest ham. YCZ is experimenting on 3.9-Mc. 'phone with a battery-powered rig with a mere .2 watt input. IHD reports the noon meeting of the Tri-County Net on 3820 kc. is doing fine and that some of the gang meet at 6 A.M. also. K6AUZ made 91 c.w. contacts and 41 'phone contacts in the CD Parties. Traffic: W6QIW 143, K6NBI 136, W6IHD 8, FYW 4.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, T. Bruce Craig, W5JQD — SEC: RRM. PAM: IWQ. RMs: PCN and QHI. The AREC report shows a continual increase, but there still are many ECs who are not getting their reports in. Two-meter activity is increasing with the coming of the season. UHV has made a very nice report on the 10-meter emergency drill in Dallas. More than 20 amateurs participated. The Dallas Amateur Radio Club held a special meeting May 7th to see the slide demonstration on Television Interference shown by 1ICP, of ARRL. TTU was in the news in the *Fort Worth Star Telegram*. The North Texas C.W. Traffic Net had 24 sessions in April and handled 120 messages; they could use some additional members. JNK is operating about 50/50 mobile and fixed. GER is now traveling out of San Francisco. The South Plains Amateur Radio Hamfest drew some unusual visitors including 6FDJ, president of the Oakland, California, Club. The first meeting of the four SCMs, the Division Director, and the Vice-President of ARRL was an added feature. New officers of the Wichita Falls Club are PZS, pres.; QJY, vice-pres.; and QJZ, secy.-treas. The Northwest Texas Emergency group was activated on May 1st, when Vernon was hit by a tornado. VSN has a new harmonic. LGY was active in the Easter Pageant. ATG and family attended the hamfest at Longview. BSX reported a country fire from mobile. He also is getting on 2 meters. Traffic: W5TFB 1203, K5FFB 667, W5PAK 188, UFP 163, KPB 130, CF 104, YPI 76, UBW 74, VHF 60, AHC 55, GER 39, PCN 37, LGY 9, OCV 7, ROH 6, YXR 4.

OKLAHOMA — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, GIQ. SEC: CKQ. PAMs: SVR, ROZ. PNG has a new HQ-140X and a new grandson. PGN is going on a three-week West Coast vacation. EHC is working aeronautical mobile while on experimental flight trips. CKQ is back on the air with a borrowed transmitter, and after the recent tornado scare is really getting busy. An All-State EC get-together is slated soon. New County ECs are YPJ, VEP, and VLW. The best event of the month

(*Continued on page 112*)

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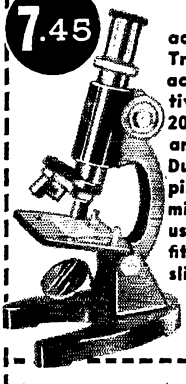

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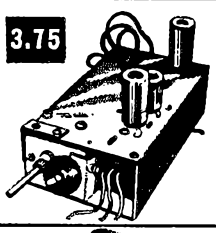

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was the Lubbock Hamfest, which your SCM attended on the way to Colorado. All West Gulf SCMs, the Director, and the Veep of ARRL were invited to breakfast by JQD and his XYL, followed by an all-morning conference with better acquaintance and understanding. It cannot be denied that a cyclone scare does more to make members of the AREC and other hams conscious of impending disaster and the need for plans and practice than all the warnings of c.d. and shouts of ECs. The Caravan Club of Oklahoma City and the Oil Capitol Mobile Club of Tulsa were both on the job with other stations, both fixed and mobile. Atmospheric interference was very bad, showing the need for adequate power of portable emergency gear. The Lawton-Ft. Sill gang did a wonderful job with the Easter Pageant traffic both on MARS and on the ham bands. Traffic: W5PML 641, K5USA 424, W5GVV 289, YJ 131, KY 126, MFX 123, GVS 84, SVR 79, TNW 65, ESB 58, SWJ 55, GIQ 47, VAX 29, PNG 27, EHC 19, FEC 13, VEP 6, VBG 5.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — The GCARC reports: JRV still is carrying on with the FB code practice. BPH is now General Class. ULN is Extra Class. AUN and YBL, a father-and-son team, have a new 813 rig. The Port Arthur ARC has recommended BCF as EC. VWF is on with a new 813 fixed rig. KSW has been released from the hospital and is back at home QTH. There is a new 75-meter mobile net in Houston, the Society of Bachelors. JHW, NOT, BHY, WTN, and others are charter members. URU is doing FB with his new mobile. He also is on 75 meters with 300 watts and a vertical and is working on public relations for HARC. FJF will be a candidate for Director in the next election. QZJ reports that Tom Jones, of Austin, gave a very interesting talk on transistors at the April meeting of the Austin Amateur Radio Club, Inc. Dr. Kenneth Hannah, of Austin, also spoke before the Club on the use of test equipment. Report from FJF on his recent trip to ARRL Headquarters in Hartford and the FCC in Washington, D. C.: I have been a member of ARRL for many years but have never had the opportunity to find out exactly what it does and how it operates. Recent developments have opened my eyes and I decided to go East to find out the facts for myself. My investigation reconfirms my original idea that the League is our mainstay. We have an organization to be proud of, one which has been carrying the ball for us for many years. Most all the staff of 60 are hams and they act in our best interests to better amateur radio and maintain our rights and privileges. A close examination of the financial report shows that the business of the League has increased steadily under capable and efficient management. Membership has increased yearly. We must strengthen *our* organization by increased membership and activities, so it can represent us the way we want to be represented. My trip to the FCC in Washington was a pleasant one — a very large percentage of the staff is composed of active amateurs and they really have our interests at heart. Participate in Emergency activities. Support the ARRL and local clubs. Keep informed. Improve public relations. Traffic: W5MN 754.

NEW MEXICO — SCM, G. Merton Sayre, W5ZU — SEC: MYI. PAM: BIW. V.H.F. PAM: FPB. RM: JZT. New Mexico amateurs were saddened by the passing of our oldest member, Dr. L. A. Jessen, NKG, in April. Doc was our most reliable net member for years, and will be missed by all c.w. men in various nets. JZT has consented to act as RM. The New Mexico C.W. Net will adjourn net meetings until September. The Hobbs ARC has reactivated after several years of inactivity and is asking for ARRL affiliation. Officers are CEE, pres.; SZS, vice-pres.; UDU secy.-treas. OIA has a Gonset Communicator for liaison with the local C.A.P. QHK lost 20- and 75-meter antennas in the wind. YWG, mobile, came upon a 3-car wreck and called police assistance via BIK. N.M. MARS Net assisted C.A.P. with search coördination. UJV has to seek a lower altitude, but promises to keep his antennas up. New Mexico v.h.f. enthusiasts planning for transcon are: CA and NSJ to Capillo Peak, FAG on Mt. Withington, VWU at Tucumcari. Others on v.h.f.: FPB, FJE, WQS, ZFS, EDK, PXA, MYQ, KCW, SOV, WOX, WIY, ZU, and WN5s CFJ, DFJ, DJQ, and DNK. Traffic: K5FEF 546, NRX 329, W5ZU 30. YFN 22, NUN 20, LLG 19, BZA 11, CEE 9, BIH 7, ARB 6, CXC 2, ZM 1.

CANADIAN DIVISION

MARITIME — SCM, Douglas C. Johnson, VE1OM — Asst. SCM: F. A. Webb, 1DB. SEC: RR. ECs: DQ, EK. PAM: OC. New appointments are: BN, OO Class I; VO6U, OPS. ED is active from Dartmouth QTH, using a new Globe Scout. KM, ex-VE7AJV, is on the air from the Dartmouth Area. PT, DQ, FQ, and WX are heard mobiling on 75 meters. SI is the proud possessor of a Collins transmitter. WL reports success on his latest project, W1JEQ's three-control six-band 813 transmitter in Jan. *QST*. VB is using a new all-band tuned doublet. ZZ needs a few countries for 100 worked on 3.5 Mc. EK is progressing with the reorganization of the Halifax c.d. set-up. VO6U is QRL as NCS of the Labrador Net, but finds time to get on 220 Mc. for local c.d. and ragchewing. Goose Bay Amateur Radio Club officers are VO6AH, pres.; VO6X, secy.-treas.; VO6U,

(*Continued on page 114*)

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TRUE AMPEX performance in a 26-lb. miniaturized professional package eagerly awaited for years by broadcast studios, musicians, schools, audio-visual groups, high-fidelity enthusiasts! Like all Ampex models, the ratings are conservative: a recording made on the "600" when played back side-by-side with the same recording from the big Ampex 350, gives the SAME class of fidelity and equal accuracy of timing and pitch. Don't miss this opportunity to get immediate delivery of America's most advanced portable recorder.

SPECIFICATIONS: full track 7½ i.p.s., uses 5 or 7" reel; quantitative record level meter; independent mike and line level controls provide a "built-in" 2-channel mixer; phone jack for monitoring input to record head or playback output of tape; may be played in any position. 8 x 13¾ x 16½" in Samsonite luggage case. Takes high impedance mike, easily modified for low. 117V 60 cy., 61 watts. Ship wt. 30 lbs.

Order No. 34-531Q

RADIO SHACK

CORPORATION

167 Washington St., Boston 8, Mass.

public relations. VO6B is kept busy on 75 meters with Labrador and Newfoundland Nets. VO6B Northwest River, VO6AF Nain, VO6S Hebron, VO6G Rigolette, and VO6K Makkovik are doing an FB job for the people along the coast handling considerable traffic with a fair amount of emergency traffic regarding lost aircraft, air evacuations, etc. W3VFI/VO6 is new on the hill with a Viking transmitter and is handling a lot of 'phone patch traffic Stateside. Also active are W3TZQ/VO6, W3BFW/VO6, W7RTS/-VO6, W8OWO/VO6, and W7SNR/VO6. Traffic: (Apr.) VE1FQ 191, OC 80, AAW 70, QM 55, VO6N 36, VE1ZM 32, OM 29, UT 13, VO1D 7, VE1BN 3, DB 2. (Mar.) VO6U 173, VE1OC 73.

ONTARIO — SCM, G. Eric Farquhar, VE3IA — Late reports and lack of news from areas that are believed to be active makes contributions to this column very difficult. Again your coöperation is being requested with regard to letting your doings be made known. To DPV, a 13-year-old-ster of Sarnia, with a code proficiency sticker of 15 w.p.m. and holder of a Class B license, we say welcome to ham radio. EAB is doing a fine job as editor of the *Mohawk Bulletin* and merits our praise. BVR has a change of call to BNQ, the former call of Al Whetham who, though a Silent Key, is still in the thoughts of many for his fine ham spirit and work on behalf of the Hamilton Amateur Radio Club. Members of the Kitchener-Waterloo Radio Club enjoyed an interesting tour through the local telephone exchange. A recently-formed radio club in this section is the Capreol ARC which we welcome and from which we solicit news. Officers are AIG, pres.; DRE, vice-pres.; AQC, secy. Ontario section traffic men are reminded of QEN, now meeting Sundays at 1030 hours on 7155 kc. AGU presented an instructive talk on civil defense and some of its operating problems to a well-attended meeting of the Ottawa Radio Club. Congratulations are extended to CCV on the arrival of a jr. operator and to CBW on being a new call in this section. CAB sports a new receiver and DFE an all-band rig. Traffic: (Apr.) VE3ATR 129, BUR 114, AJR 102, TM 87, AOE 31, AUU 29, NO 28, IA 26, EAO 23, DQA 21, DQX 17, KM 17, DPO 9, VZ 4. (Mar.) VE3TM 115, NG 108.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — BK has an 813 with pi-net final going, and it works out well. ADK is recovering nicely from spinal surgery. Best wishes from the gang for a complete and speedy recovery, OM. ACD is on 3.8-Mc. mobile. QJ has changed QTH to Montreal. APE has 140 watts on 75-meter 'phone. EC reports continuing skeds with AEM, ACS, APP, KJ, and LE. KG has converted a 522 rig for 144 Mc. and has it on the air with a five-element beam and is looking for contacts from W-Land. The South Shore ARC has a club station completed using TBS-50 and S-76 with folded dipole on 10 and long wire on 75 meters. The Club also is conducting code classes for new members. CA has been off the air revamping the rig and is again back in action but finds conditions on 20 meters very poor. BB, DR, LM, LO, GK, and NV hold the fort on PQN, with DR handling considerable traffic. Traffic: (Apr.) VE2DR 177, BB 75, EC 45, LM 16, LO 5, CA 2. (Mar.) VE2CA 18.

BRITISH COLUMBIA — SCM, Peter McIntyre, VE7JT — The main report from Vancouver Island is that operation on 2 meters is increasing to the point of QRM amongst the boys. Woe is operation without QRM. The hidden transmitter hunt under the new AEC for mobiles, VE7WO/m, was held April 25th and the winner was VE7DD/m. There was a good turnout and the gang is wondering what secret weapon is used for DFing the hidden transmitter as there is no DF loop in evidence. At the moment the AREC and the c.d. communications section are coöperating in exercises to be prepared for possible emergency communications in the advent of floods in the Fraser Valley. There are still gaps that could be filled if the individuals would take time to write and pass along the doings of the clubs, other amateurs, and activity on the various bands. Mr. Kitchin, of the local R.I. Office, had a very good letter in the B.C. *Amachewer*. Hope you read it and gave the contents thought. We hear that TF is back in operation after being out of town and having TVI trouble. The local c.d. mobiles on 2 meters are finally all in operation on the ame frequency, whick makes everybody concerned happy. The operation of the AREC Net still is going strong with many new calls being heard checking to the Net throughout the Province. Traffic: VE7QC 195, DH 40, FS 8.

YUKON — (See June *QST* for notice soliciting ARRL member nominations for SCM vacancy.) — NG is getting married while on vacation from Baker Lake. MR is QRL to a new home. RW, Port Radium, is on 20 and 75 meters. RZ is active on 20 and 75 meters. SJ is QSY to Fort Providence. SW and his 17 watts does well and makes the Polar Net nightly. MW, with a Viking, keeps Cambridge Bay active. MA, MB, MC, MD, and ML work the bands between weather readings. MF and MG are low power but keep Aklavik active on 75 meters. Band-hopping 8GY, 6YZ, and KL7AON contacted on 6 bands, 10 through 80 meters, in one hour. 2APA, 3BUO, and 3AAS made 8GY/portable the most northerly Field Day site in the world on a mountain overlooking the Arctic. OJ visited Kingston so long his XYL Joan got her ticket and now is 8OD, the

(Continued on page 116)

Leo I. Meyerson, WØGFQ
C.U. on 10, 20 & 75 Meters

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GLOBE KING TRANSMITTER

• In keeping with WRL's policy of always giving you MORE WATTS PER DOLLAR, we now offer you a complete 500 watt band-switching 160 through 10 meter transmitter using the popular husky 4-250 A tube in final. Complete TVI shielding and by-passing of RF section and meters. Includes co-ax antenna change-over relay and push-to-talk features. Pi-network final tuning will match any antenna system from 52 to 600 ohms with output impedance selector switch on front panel. This arrangement serves as an ideal antenna tuner. Metering of all stages with 2 — 3" meters. Several safety features included for protection of final tube which is forced air cooled. High level 100% plate modulation. XMTR designed for future use with single sideband exciter. Class B 5514 modulators with separate power supply and 4 stage speech amplifier. New dual high-low voltage power supply for final and exciter. New streamlined compact style hammertone finished cabinet approximately 31" high, 21¾" wide and 15" deep. Has provisions for VFO.

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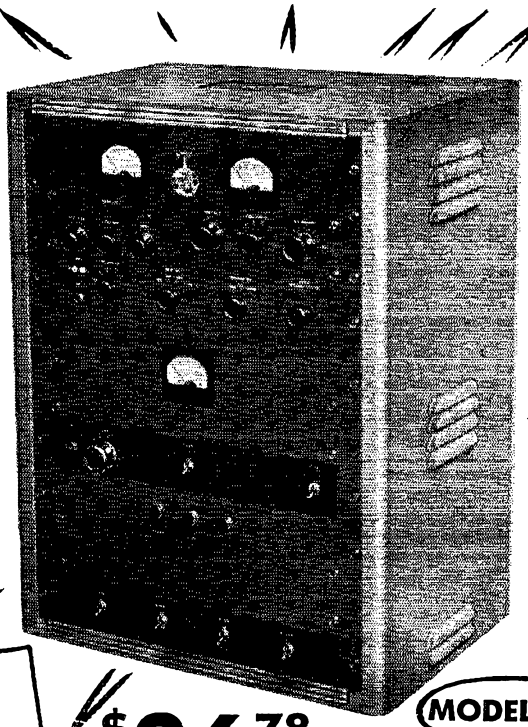

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$36.78 PER MO. (18 MO.)

$67.50 CASH DOWN

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Other terms can be arranged to suit your budget.

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Complete Band Switching
NEW MODEL 40A
GLOBE SCOUT XMTR

Ideal XMTR for the Novice or experienced Ham.
50 WATTS CW — 40 WATTS PHONE

160 thru 10M with combination pi-network antenna tuner. 100% modulation of final. Has complete power supply. TVI screened cabinet.

Wired-Tested **$99.95**

Kit Form **$89.95**

$8.95 per mo. (12 mos.) **$10.00** cash down

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Q-7

Rush top trade-in value of my_____.
Make and model of new equipment desired_____.

E-Z Pay Plan: ☐ 6 mos. ☐ 12 mos. ☐ 18 mos.

Please rush: ☐ Globe King, ☐ Globe Scout Catalog Sheets.

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only XYL operator in N.W.T. GY looks for VE3s and gets 60 countries and 54 VE8s. The Polar Net does well with VE8s; VEs 3, 4, 5, 6, 7; Ws 2, 4, 6, 7, Ø; KA, KL7, VK, OD, YI, and HB stations checking in on 14,195 kc. Ex-6XM, now 8XM, does well with n.f.m. and AQ with TBS-50 on 20 meters at Snag. AC will be QRT QRL hauling goods via his boat to Old Crow. AR is councilman at Mayo. BV is QRL repairing radios. KJ is busy with RCAF duties. AW has been heard very little after reaching 160 countries worked. AI is kept busy with CFWH at Whitehorse. AT is sanitary inspector for Yukon. DB is rebuilding with 6146 final. AO increased power to 100 watts and is kept busy as the most active Southern Yukon station. CT, CG, EC, DF, and AY work 40-meter c.w. DF, the XYL of AO, is the only XYL operator in Yukon. VE8 news may be sent GY or AO for forwarding to *QST* via VE5HR until an SCM is elected.

MANITOBA — SCM, Leonard E. Cuff, VE4LC — IF and RO are busy building vertical beams for 20 meters. JM now has her transmitter repaired and her sweet voice may be heard on the 75-meter Manitoba 'Phone Net daily. RB took a few days off from his drug business in Killarney and spent the time visiting the gang in Greater Winnipeg. FU may be heard again on the 75- and 20-meter bands after a long lay-off. TT recently became the proud possessor of an AR-88LF receiver and now hopes to hear and work lots of DX. We were very sorry to hear of DJ's auto accident in Eastern Canada in which Mickey was badly hurt. At the time of writing this column we hear that he is still unconscious, but we all wish him a very speedy recovery. I wish to say thank you to all the gang for their fine response in sending in the traffic reports this month. Keep up the good work, gang, and add a few items of news to your reports as well. New calls heard this month are QZ, LD, JT, BV, RJ, JS, BW, AM, and NH. The Manitoba C.W. Net meets on 3700 kc. at 1900 CST Mon., Wed., and Fri. Traffic: VE4AI 23, GE 23, AZ 19, YR 19, VE5DS 18, VE4RB 16, EF 14, HL 14, KG 14, AO 5, GB 4, JY 4, BN 3, FD 3, FJ 2, MO 2, WS 2, GG 1, RF 1, RG 1.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — It has been good to see the 'phone net so active lately and to know the poor conditions of this winter have not affected the roll call. Any station wishing to join, please contact QL, the PAM. EE is rebuilding for 144 Mc. AJ has done well working ZL and VK stations on 3.5-Mc. c.w. LQ has a new VFO. BG has his ticket endorsed for all-band A3 and is doing well. DR rebuilt mobile to cover 14 Mc. MS received his 30-w.p.m. sticker, copying W1AW on 3555 kc. QW now is with RCAG Signals. CW is EC for the Regina Area and is looking for members in this district. LU reports for SEC and is looking for reports from all ECs. Some of you have yet to make a report. FR has a new SX-71. EW is building mobile, KD is working on his 'phone ticket. GH received a nice write-up in the Regina papers on his ham activities. PJ is back on after a session in the hospital. WW, mobile, visited Saskatoon. HR got in the last CD Party and the last two LO Parties but found LO stations scarce. Traffic: VE5DS 35, CW 26, HR 25, CI 10, QL 10, RE 10, PJ 7, BF 4, LE 4, LU 4, WH 4, CB 3, GX 2, HS 2, MA 2, VL 2.

Suggested Output-Circuit Change for the Pygmy Powerhouse

This modification permits any output capacitance up to 1500 $\mu\mu$f. to be used, and increases the flexibility of the rig described by W3HII/4 in April, 1954, *QST*.

1) Remove the low-impedance switch, S_4, and the 100-, 500- and 1000-$\mu\mu$f. 1000-volt mica condensers.

2) Install in their place a progressively-shorting switch (Centralab PA-2042) and five 250-$\mu\mu$f. 1000-volt mica condensers. Leave the end position of the switch open for use with a high-impedance load.

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FIREWORKS

. . . for the 4th. And we've got some real hot bargains for the hams. If you have any problems, call Uncle Dave W2APF, or drop a note to Tiny Miller for some help.

PARTIAL LIST OF USED EQUIPMENT

Sonar FM Exciter	$ 50.00
Sonar MB 611	25.00
Morrow 3 BR-5 (New Condition)	45.00
Micro-Match MM1	25.00
Web Transmitter 10 Meters 25 Watt (New)	25.00
Hammarlund Comet Pro, speaker	50.00
Thordarson 100 Watt all-band Transmitter	95.00
Collins 32V3 (Like New)	695.00
National NC 183 D with speaker	295.00
Hallicrafters HT-9 (No coils)	100.00
Hallicrafters S 53 A	75.00
RME DM 30 X	20.00
LaFayette VHF Converter, 10-20 Meters	25.00
Bud VFO	25.00
Harvey Wells TBS 50 D	90.00
Meisner EX. Signal Shifter with FMX	50.00
RME HF 10-20 (Like new)	75.00
RME DB 22 A (Like new)	75.00
Eldico TR 75 TV	50.00
Eldico Modulator	50.00
National HRO 60 with coils and speaker (Like new)	450.00
Globe Trotter Transmitter	99.50

Collins 32V-3 Transmitter

$775

VFO Controlled, Bandswitching, Gangtuned. Covers 80, 40, 20, 15, 11 and 10 meters; 150 watts CW; 120 watts phone; entire RF section enclosed in metal shield. (In Stock)

COLLINS 75A-3 RECEIVER **$550**

With Mechanical Filter and Speaker

JOHNSON VIKING II

$279.50

(In Stock)

Kit, complete with tubes — less crystal, key and mike.

Wired and Tested, $337.50

GONSET COMMUNICATOR

2-Meter Transmitter Receiver

Model 3026	Model 3025
$209.50	$229.50

Operates from either 115-Volt AC or 6-Volt DC source.

SPECIALS CLEARANCE

STANDOFF INSULATORS, low loss steatite, nickel plated base and top.
½" x 1⅜" — 13c ea.; 10 for $1.00
½" x 2⅞" — 17c ea.; 10 for $1.45
¾" x 4⅞" — 43c ea.; 10 for $3.20
¾" x 6⅞" — 59c ea.; 10 for $4.75

FEED THRU INSULATOR, ceramic.
For 1" hole, 41c ea.—10 for $3.25
For 1½" hole, 45c ea.—10 for 3.50

INSULATOR, cone type
1¼" high, 18c ea. — 10 for $1.50
3" high, 42c ea. — 10 for 3.25

TUBES — standard brands
6AK5 ..... 69c ea. — 6 for $2.50
6C4 ..... 39c ea. — 6 for 2.00

MINIATURE VARIABLE CONDENSERS Screw driver adjustment.
25 mmfd.....25c ea.—5 for $1.00
140 mmfd....75c ea.—4 for 2.50

SOCKET, 7 pin min., mica filled, shield base .....10 for $1.00

SWITCH, phenolic sec., 2 d., 3 p., 3 pos., NS....29c ea. — 4 for $1.00

VIKING MOBILE

TRANSMITTER KIT

$99.50

Amateur Net

Immediate Delivery

SUMMIT RC 1A

2 mtr. conv. with tubes and xtal.

SPECIAL while they last..... **$35.00** ea.

Mobile Special

NEW SHIPMENT

Hand mike, single button carbon. Complete with cord and plug. Finest made.

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ANTENNA ROTATOR SPECIAL

Will hold up to 200 lbs.

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Complete with 100 ft. 4 Cond. Control Cable

SONAR SRT 120 TRANSMITTERS

All bands 120 w. CW, 100 w. phone

Switches to all six bands. TVI suppressed, with 10 tubes

SRT 120 Kit	$159.50
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VFO 120	$19.95
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Electric "HAM" Clock

Again by popular demand

24-Hour with GMT Indicator

$11.95 Ea.

Regular $15

872A surplus tubes ea. $2.25
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Use 6-Volt Pilot Lamp

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New

ELMAC TRANSMITTER AF-67

Trans-Citer

$177.00 Net

CABLE SPECIALS

4 cond. rotor ..... per 100'	$2.50
RG 59/U 6c ft. ... per 100'	4.00
RG 58/U 6c ft..... per 100'	4.00
RG 8/U 14c ft. ... per 100'	9.00

Kilowatt twin lead, clear poly insulated. 12 ga. cond. 9c ft.
100' 5.00

DYNAMOTOR GN45B

6V in, 400 V 160 MA out. Complete with conversion diagram and brushes. Will go Parcel Post. **$19.95**

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TELEPHONE ALBANY 5-1594

Potted Circuits

(Continued from page 19)

factor. The old adage "A little goes a long way" is appropriate. The cost of a cubic-inch embedment or casting is approximately 10 cents, and the cost of using the Flexo-Mold is about 9 cents per cubic inch of material. Most of the materials used are supplied in pints, quarts, or gallons, with appropriate discounts for the larger quantities.

Other Materials

Not only do these embedding and casting resins find application in the industry but various other materials have been investigated and show extremely interesting possibilities for applications in electronics. Materials such as liquid plastic dips can be utilized for dip-insulation of individual components and entire circuits. All that is required for the use of these materials is to dip the component into the liquid plastic, withdraw it very slowly, place it in an oven (350 degrees F.) for 5 to 10 minutes and the resultant product will be a tough, flexible, rubber-like coating. Applications for this product can be visualized in the coating of metallic components such as certain types of coils, capacitors, tool handles, and other similar items.

Another type of material being investigated is a liquid plastic which upon oven curing forms a resilient spongy film with a unique unicellular structure. The material can be used as a shock-absorbing coating for pressure sensitive or delicate components, for setting glass in metal frames, as a cushion against vibration, and for mounting delicate instruments. Flowed-in-place gaskets can be made, eliminating stamping, gluing and crimping. They form a shock-resistant cushion which makes effective seals against moisture, gas, solvents, oil and pressure.

Still another new material available to the industry is a putty-like plastic that can be handled like household dough. This material can be rolled, stamped, extruded from a cookie maker, shaped like modeling clay and, upon curing in an oven, is converted into a tough, rubbery plastic. The user can extrude intricate shapes, form tailor-made gaskets, fuse the material in place, and hand-mold any complex designs and shapes desired.

Sources

All the plastic materials discussed in this article may be obtained from Plastronics, P.O. Box 96, Winter Hill 45, Massachusetts, or the Commercial Applications Laboratory, 111 Shore Drive, Somerville, Massachusetts. These concerns offer a free consulting service to customers for almost any problem or application. They have and will supply on request technical information and price quotations for all the plastic materials investigated by the authors. Mold-release material can be obtained from Injection Molders Supply Company, 3514 Lee Road, Cleveland 20, Ohio.

High-Power Linear

(Continued from page 22)

should just barely flicker with modulation, the screen current rise from about 1 ma. to 20 ma., and the plate current increase from an idling value of 50–100 ma. to 400 ma. on peaks. The amplifier has been operated with excellent linearity with the following range of applied voltages:

Plate	*Screen*	*Bias(–)*	*Pwr. Input*
3000	750	90	1000
2500	750	80	1000
2000	600	65	600
1500	600	60	450

At 2000 and 1500 volts, it is necessary to operate in the region of grid current, and some swamping of the grid circuit is desirable, although not absolutely necessary. In this connection, it should be recognized that the 10A exciter has some swamping built into it. Since the amplifier as operated by the author just barely invades the grid-current region, no swamping is included in the amplifier.

This amplifier is completely stable, free from parasitics, and has excellent linearity. Operating on 75, 40 and 20 there is absolutely no TVI on Channels 6 and 10 in a fringe area, and only very weak BCI has been noticed on the home b.c. receiver. It should be mentioned, however, that because of the high *Q* of the multiband tuner on 20, only sufficient power is available using the 10A to drive the amplifier to 600 watts. No operation has been attempted on 10 or 15 yet, due to the lack of suitable injection frequency for the exciter.

Correspondence

(Continued from page 63)

HAM'S HAM

Box 227
Peru, Indiana

Editor, *QST:*

The XYL and I arrived home safe and sound, tired and happy, after a most wonderful trip. I wish it were possible for me to describe the wonderful things which have happened to us during the past few weeks, and for me somehow to express my appreciation in such a manner as to show at least a part of my gratitude.

The General Electric Company, the United States Weather Bureau, the Post Office Department, the Chesapeake and Ohio Railway, the Peru Jaycees, the Dave Garroway TV show, the Welcome Travelers TV show — all really gave Louise and me a grand time. However, after thirty-two years of *QST* and the American Radio Relay League, that long-looked-forward-to trip to Headquarters certainly climaxed the entire affair with a half day of pleasantness I will never forget.

Naturally I would be biased in my thinking, after all the good things of the past few weeks, but I feel amateur radio owes much to the General Electric Company for sponsoring a program which brings such world-wide favorable publicity to our hobby. I am very conscious of the fact that the entire undertaking is a tribute to ham radio as a whole, and not just one individual. I also realize that very few, if any, of our organization would have refused to handle the traffic which resulted in my recognition, if they had had the time to devote to it as I have been fortunate enough to have. Public service is only one of the many fine features of our hobby and I think we all should utilize it to its fullest extent to insure the welfare of the greatest hobby on earth. . . .

— *Stan Surber, W9NZZ*

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MAKE YOUR 100 WATTER "PUNCH THROUGH" LIKE A FULL KW!

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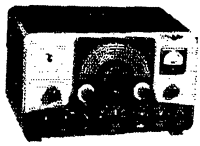

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Everything you've ever wanted in a compact, 75 watt CW—65 watt phone xmtr/exciter. Effectively TVI suppressed, the Ranger, with built-in VFO or crystal control, operates in 7 bandswitch positions from 160-10 meters. Pi output matches antenna or KW final. 100% modulation. Smooth (break-in) osc. keying. Only 15x11¼ x9"! For 115 Volt 60 cy. AC.

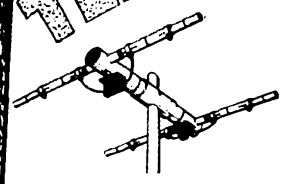
Viking RANGER Kit, with all parts, assembly and operating manuals, less tubes **$179.50**

Factory (not student) **wired RANGER**, tested and ready to go, with full instructions, less tubes **$258.00**

Complete set of 12 first grade tubes for kit or wired Ranger ..... **$ 9.95**

with a TELREX BEAMED POWER

PERFECT MATCH ARRAY!



That's right! Using a Telrex precision pre-tuned array will do just as much for your signal as would increasing by many times the output power of your transmitter! For example; the 12.1 db power gain of the six element ten meter beam means your signal will be 16 times more powerful in the desired direction! It helps your receiving too, and also knocks down the QRM from other directions. Professional engineering, close tolerance and extra-rugged construction, plus "Perfect Match Balun" are among the reasons why Telrex beams are earning such enthusiastic praise from the hams who use them.

Complete beams, with receptacle for 1:1 match for your 52 ohm coaxial cable, "Stops" for accurate assembly (specify if you want them "peaked" at other than center of phone band) and detailed assembly instructions!

BEAM	POWER GAIN	NET	BEAM	POWER GAIN	NET
2 EL 20	5.6	$ 97.00	3 EL 15	8.9	$110.00
3 EL 20	8.9	120.00	5 EL 15	11.2	210.00
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NEW! 2 EL 20"MINI-BEAM" 4.6 db power gain. Size of 10 meter beam ! ..... only **$77.50**

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Allen-Bradley adjustable, oil dashpot. 110V AC coil. Heavy SPDT contacts. **SPECIAL**..... **$3.90**

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High Voltage - High Current PLATE TRANSFORMER

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These excellent GE condensers are just the thing for your high voltage power supply . . . at a big savings. Built for use in commercial equip. 2 Mfd., 4000 volts DC. Brand new. SPECIAL..... **$6.95**

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Special Viking transmitter, with push-to-talk, etc.
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Central Electronics 20A,10B, and accessories.
Eldico linear amplifier.
And all the others!

"COMPRESSED BEAM"
3 elements — 20 meters
16' boom — 16' elements
Weighs only 24 lbs
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Multiband Tuning Circuits

(Continued from page 28)

It is also felt that these circuits can be applied to receivers, when it is *desired* to have simultaneous coverage of two bands. Using a harmonic relation (such as 2.0) for ratio K_2/K_1, one can have r.f. circuits (and hence a receiver) with eventually simultaneous coverage of two bands. Such a receiver has some obvious applications for contest work where one may operate on two bands at once or in close sequence. Tuning rates are in the ratio K_2/K_1 (in this case 2, 3 or 4), so identification of signals as to band is possible.

This article has not been intended to cover other important factors, such as resonant impedance under various coupling situations, bandwidth, loaded Q, etc. Further experimental work will undoubtedly bring forth improvements and further modifications of the circuit, as well as actual data on factors omitted from this article.

Never-Never Land

(Continued from page 30)

ably to the mechanical strength of the chassis.

It is easy to get into trouble in the circuit layout if you have one tube performing too many jobs, or if you use regeneration or other shortcuts in the hope of getting good performance with too few tubes. The best way is to use plenty of stages at low gain and separate tubes for each job. The usual precautions about short grid and plate leads have to be taken also, and the old rule about keeping an i.f. amplifier strip (for any one frequency) in a straight line is a good one. If you put the power supply, last audio stage and speaker in a separate cabinet, you will keep your receiver cabinet cool and away from the mechanical vibrations of the speaker.

Dials

Don't overlook the importance of a good dial mechanism. You can build your own by using one of the popular planetary-drive units and making a dial bezel of thin metal or plastic. A dial scale can be made of cardboard, with dial lights added for a de luxe job. This type of dial allows a half-circle scale length.

If you have some gears from surplus equipment, you can make a dial that will go around about 330 degrees while the condenser rotates 180 degrees. Naturally, such a dial will give nearly twice the scale length of the half circle. An example is shown in Figs. 3 and 6.

Remember to keep the dial simple. A direct-reading single dial is easier to read than a two-dial system or one that requires interpolation. There are many types — slide rule, drum, semi-circle and others — but the one that gives the most dial length in a given space is the circular dial. Above all, the most important thing is to have a dial with plenty of bandspread and no backlash.

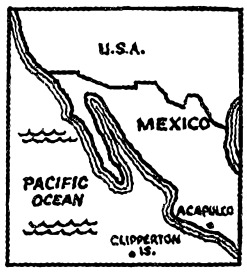
(Continued on page 124)

Winpower Generator Set Supplies Power For Radio Hams' Call For Help —

As Schooner Goes Adrift 800 Miles At Sea

On April 8, 1954, five Iowa men, Tom Partridge, Vern Hedman, Robert Denniston and Gene O'Leary of Newton, Leo Olney of Des Moines and two Mexicans with a crew of six left Acapulco, Mexico, aboard an 80' schooner bound for the lonely Pacific Island of Clipperton. Their objective was to set up an amateur radio station and contact as many amateur radio operators as possible.

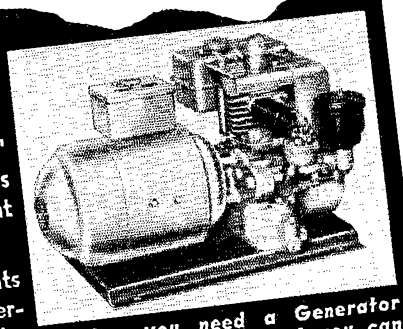
This trip, in the minds of all aboard, was to be routine, however, they did expect some difficulty in landing on the island. But undetermined fate struck. Within sight of the Island, a severe windstorm struck the expedition, ripping the schooner sails and due to a faulty waterpump, engine trouble developed, leaving the schooner without motive power. The party was in serious trouble but communication with the outside world was maintained. Fastened to the deck of the schooner, exposed to the ravages of the sea, salt water, wind and tropical sun, was a Model G-800A WINPOWER Generator Set, which despite the elements and the fact that it had been in almost continuous operation 24 hours a day for three weeks since the party left Mexico, produced unfaulty electric current for operating the party's radio transmitter receiver and for short periods the boat's bilge pump. Yes, thanks to a WINPOWER Generator Set, the party did go ashore on Clipperton Island and although the set was temporarily out of service after being dunked in the surf, did complete their objective and talked to over 1000 amateur radio operators.



This proves the statement once again that WINPOWER Generator Sets deliver dependable power when it is needed and where it is needed.

28 years of engineering and manufacturing "know-how" goes into the building of all WINPOWER Generator Sets which makes them a dependable source of electric current for anyplace on earth.

WINPOWER Electric Plants are used for portable plants or stationary plants and can be used for constant or intermittent service. There is a size for every need from the small 500-Watt to the large 12,000-Watt Set. Briggs & Stratton and Wisconsin Engines furnish the motive power for this fine equipment.



When you need a Generator Set, buy the set that you can depend on. Buy a WINPOWER.

WINPOWER MANUFACTURING COMPANY
NEWTON, IOWA

Cabinets

Steel cabinets are quite expensive, but if you can get some aluminum sheet about ⅛ inch thick, a nice cabinet can be built. Another idea is to use ½-inch plywood. With a little careful sanding and some paint, you can have a very nice-looking sturdy cabinet. If you think it needs to be shielded, nail copper screen on the inside or paste aluminum foil on the inside. If you put foil on first and then cover it with heavy cardboard, the foil will be protected from tearing when the chassis is removed. Be sure to have plenty of ventilation holes in the back of the cabinet.

Your ham friends and XYL or YL aren't going to be too impressed with your home-brew receiver if it looks like it was scooped out of the junk box and assembled "*en masse.*" A little attention to detail at this point of the game will result in a receiver that not only performs well but also looks good.

Try your hand at building your own receiver — you will enjoy it. It's even fun just listening now, since "I made it myself."

50-Mc. TVI

(Continued from page 33)

tight fit. When soldering the coils and capacitors shown in Fig. 8, the ends of these terminal wires should be clamped in a vise. The heat conducted to the polystyrene forms during the soldering is above the melting point of the material. Holding the terminals in place firmly will prevent loss of tension on the windings and consequent ruining of

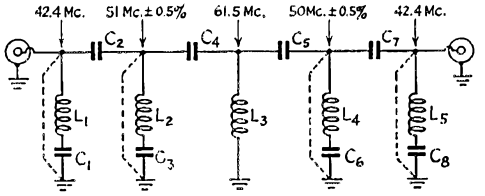


Fig. 9 — Diagram and parts information for the 75-ohm high-pass filter. Dotted lines are shorts removed after adjustment of coils.

C_1, C_8 — 39 μμf.
C_2, C_7 — 47 μμf.
C_3 — 22 μμf.
C_4, C_5, C_6 — 30 μμf. All capacitors 5 per cent tolerance (El Menco CM-15).
L_1, L_5 — 0.36 μh., 7 turns.
L_2 — 0.45 μh., 8 turns.
L_3 — 0.11 μh., 4 turns.
L_4 — 0.34 μh. 7 turns. All coils No. 28 enam. on ¼-inch polystyrene forms.

them and the form. During the final assembly in the case, damage to the forms can be prevented by wrapping both leads of each remaining capacitor around its mounting terminals before doing any soldering. Thus the terminal being soldered is supported by the others.

Construction of the 75-ohm filter is very similar, except that there are four less capacitors, and all the coil forms are ¼-inch diameter. All but the middle form are 1⅜ inches long. The latter is 1

(Continued on page 126)

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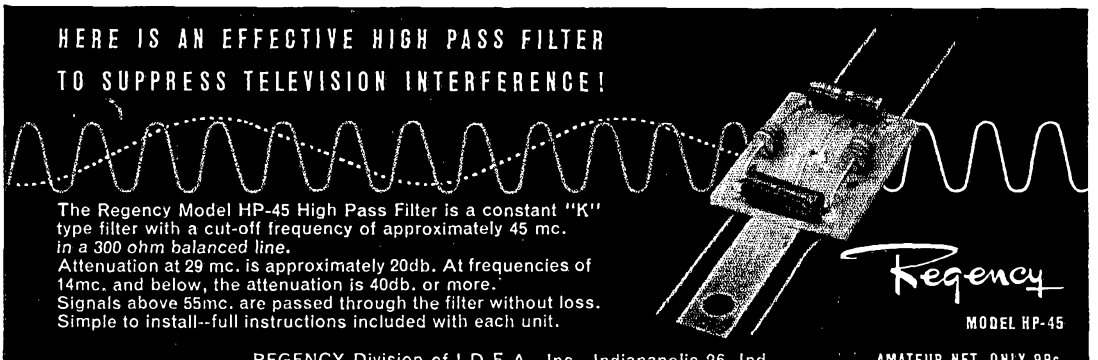

The Regency Model HP-45 High Pass Filter is a constant "K" type filter with a cut-off frequency of approximately 45 mc. *in a 300 ohm balanced line.*
Attenuation at 29 mc. is approximately 20db. At frequencies of 14mc. and below, the attenuation is 40db. or more.
Signals above 55mc. are passed through the filter without loss.
Simple to install--full instructions included with each unit.

Regency
MODEL HP-45

REGENCY Division of I.D.E.A., Inc., Indianapolis 26, Ind.

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inch. Spacing between all coil terminals is 5/16 inch. C_1 and C_3 are grounded to a lug fastened to the case midway between L_1 and L_2. C_6 and C_8 are similarly grounded to a lug between L_4 and L_5. L_3 is grounded to a lug near the base of its form. The filter looks very much like the 300-ohm model, except for the ground connections, the coaxial terminals and the four less capacitors. Adjustment is carried out in the same way.

Adjustment Procedure and Installation

It will be noted that the filter diagrams give tune-up frequencies for each section. The dotted lines indicate short heavy busses to be installed after the assembling of the filter is completed. The turn spacings of the coils are adjusted to give resonant frequencies as shown, with all four busses in place. Next, cement the windings in place, allow to dry, and then remove the busses. The filter is now ready for use.

The frequencies indicated for the two coils either side of the center one must be held within very close limits if the desired characteristics are to be attained. Check the accuracy of your grid-dip meter in a well-calibrated 50-Mc. receiver before making these adjustments. The frequencies indicated for the other sections will be close enough if the average grid-dip meter calibration accuracy is used.

If the capacitors are within the tolerances specified, and the filter is adjusted carefully as described above, it should show no noticeable loss on any TV channel. For best results, the filter should be grounded to the TV receiver chassis and mounted close to the tuner. Where the receiver has an appreciable lead length between the input to the tuner and the antenna connections at the back of the receiver cabinet, installing the filter at the latter point will reduce its effectiveness considerably. A small sheet-metal bracket can be used to ground the filter case to the receiver chassis, often using existing holes in the chassis.

These filters are capable of ending a lot of TVI woes. Installed on your own TV set, one should permit you to receive all channels, including 2, without TVI due to fundamental overload while you operate your ham rig on any amateur frequency up to at least 51 Mc. The 300-ohm filter has enabled me to operate as high as 52.6 Mc., with an effective radiated power of 480 watts, without a trace of TVI on Channel 2. I live in a semifringe area. Need I say more?

Radiotelephony

(Continued from page 88)

some static plate current be drawn. As a result, the tubes will conduct during slightly more than half of a signal cycle.

Although the preceding definition is the strictly-accurate one, a Class B amplifier is more likely to be thought of as one with acceptable distortion in which the plate current (as read by a d.c. meter) varies with the signal. In other

(Continued on page 128)

words, the meter indicates more current on louder passages than on weak ones. And there are intermediate designations between A and B. An AB_1 amplifier is one that operates Class A at low signal levels, but the d.c. plate current varies at high levels. No grid current flows at any time. An AB_2 amplifier is much the same: it operates Class A at low signal levels, the d.c. plate current varies at high signal levels, but grid current flows on signal peaks. The so-called Class B amplifiers you will run into are actually AB_2 amplifiers, although Class B operation is approached fairly closely with a few special tubes designed for the purpose.

It is impossible to make use of two triodes' full capability in Class AB_1 operation, and they are always run Class AB_2 when full output is required. (They can't be made to draw enough plate current unless the grid is driven positive.) On the other hand, one tetrode type (the 6146) will deliver almost as much in Class AB_1 as it will in AB_2, because the screen voltage helps to make the tube draw high plate current even when the control grid is negative. However, most tetrodes will give from 20 to 100 per cent more output in AB_2 than they will in AB_1. The Class AB_1 amplifier, which requires no grid driving power, is easier to drive, and this may be a consideration in some instances.

The Driver Stage

The stage that supplies the signal to the audio power amplifier is called the "driver stage." As mentioned above, it usually poses no problem in Class AB_1 operation, and it may be a resistance- or transformer-coupled stage of low power capability. It is not always possible to use resistance coupling, however, because some tubes are restricted in the permissible resistance in the grid circuit, and it will be found difficult to get sufficient grid swing. However, transformer coupling can be used in such cases. When resistance coupling is used, it is necessary to use a "phase inverter" stage somewhere in the audio amplifier, to get the necessary push-pull excitation for the power stage.

In Class AB_2 operation it is important to maintain the grid-voltage waveform when the grid is drawing current. This is usually done by selecting for the driver stage a tube, or tubes, with low plate resistance, since a low plate-resistance tube can maintain a signal into a variable load — the grid circuit of the modulator stage — better than a high plate-resistance tube. The variable load is presented as the grid voltage swings from negative (no grid current) to positive (grid current). For best economy it is desirable to utilize as much as possible of the available power of the driver stage, and for this reason some care must be exercised in selecting the proper transformer for coupling the driver stage to the modulator. The selection of transformers for modulator stages will be the subject of a future article in this series.

[Part IV of this article will appear in a subsequent issue. — ED.]

YL News & Views

(Continued from page 61)

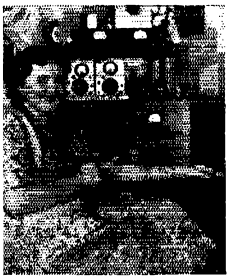
Kay, of Richmond, Va., had the highest YL score. KN6CQT, Louise, of Reedley, Calif., who led the San Joaquin Valley Section and the Pacific Division, is just 10 years old! (Complete N-R results were in June *QST*.) Both WN4BLR and WN1YNI, Elizabeth, of Concord, Mass., had high Sweepstakes scores, too. Congratulations all around!

—•••—

Here are details about the top scorers of this year's YL-OM Contest. Last month's column contained the complete contest results.

Frances Krepp, W4KYI, of Kannapolis, N. C., worked only her favorite band in the contest — 75 'phone. Last year she was high YL 'phone scorer in this contest, and in the YLRL Anniversary Party she made the highest 'phone score for the fourth call area. She uses an ARC-5 as VFO feeding a single 813 final, and modulates with a pair of 805s.

W4ARR



W4KYI

Licensed in 1946, Frances met her OM, W4SIB, via 75 'phone in 1949. Her mother is W4ZOI, and her dad is W4CXI. She holds YLCC No. 15.

OM winner W4ARR, Bob Crane, of Birmingham, Ala., proudly admits to being a "YL chaser." His XYL, W4YYJ, Lois Anne, has attached the slogan "The YL-Chasing Station of the Nation" to his call. Bob claims that he has been diligently working for YL certificates for the past year and "can truthfully say that [he has] met more really nice people over the air than at any time during [his] ham career." (Such a compliment! He was licensed in 1930. — Ed.) His efforts have won him YLCC/186 and WAS/YL, and he has three out of six for WAC/YL. For three months he has been net control for the YL-OM Roundtable. He works all bands, c.w. and 'phone, and uses a 32V-3 and 75A-3. A bit previous but nonetheless prepared and eager, he is already admonishing YLs to be sure to be on hand for next year's contest!

—•••—

We correct the address of YLRL Vice-President Ruth Siegelman, W2OWL, as given in last month's column. Questions and suggestions pertaining to the YL-OM Contest and the YLRL Anniversary Party should be sent to Ruth at 1414 Wythe Place, New York 52, N. Y.

Silent Keys

IT IS with deep regret that we record the passing of these amateurs:

W2ATE, Harry M. Frecker, Westwood, N. J.
W2CHA, Thomas Frank Keegan, Troy, N. Y.
W3UJI, Max L. Stevens, Silver Spring, Md.
W3UVM, W. Ray Milliron, Meadville, Penna.
W4PMN, Charles F. MacLean, Montbrook, Fla.
W6RR, Clarence P. Ballard, Santa Monica, Calif.
W7DP, Carlton M. Eager, Freewater, Ore.
W7LPN, Arle H. Anderson, Seattle, Wash.
WN7VIA, William Thompson, Seattle, Wash.
W7VO, Charles B. Newcombe, Yerington, Nev.
W8PAA, Paul E. Worley, Hazel Park, Mich.
W9HCF, Erwin J. Ahrndt, Hazel Crest, Ill.
W9LGT, Wilmer G. Botterbush, Alton, Ill.
W9LWP, Charles L. Hartmann, Chicago, Ill.

World Above 50 Mc.

(Continued from page 71)

Two more stages under construction, to be gang-tuned. Transmitter is 4X150A doubler, producing the legal limit of power readily. This rig was operated on 435 Mc. originally, but was changed to 432.5 Mc. Trouble then developed in Channel 13, as driving frequency was close to the TV sound frequency. A quarter-wave open stub of coax cut for the driving frequency was connected to the coaxial output lead, bringing the interfering signal down markedly. The antenna is fed with open-wire line, connected through a coax balun. An additional quarter-wave stub, this one of

WØZJB	48	W5VY	48	W8OJN	39
WØBJV	48	W5MJD	47	W8LPD	37
WØCJS	48	W5GNQ	46		
W5AJG	48	W5ONS	45	W9ZHB	48
W9ZHL	48	W5JTI	44	W9QUV	48
W9OCA	48	W5ML	44	W9HGE	47
W6OB	48	W5JLY	43	W9PK	47
WØINI	48	W5JME	43	W9VZP	47
W1HDQ	48	W5SFW	44	W9RQM	47
		W5VV	42	W9ALU	47
W1CLS	46	W5FAL	41	W9QKM	46
W1CGY	46	W5FSC	41	W9UIA	45
W1LLL	46	W5HLD	40	W9UNS	45
W1L8N	44	W5HEZ	38		
W1HMS	43	W5FXN	38	WØQIN	47
W1DJ	41	W5LIU	37	WØDZM	47
				WØNFM	47
W2AMJ	46	W6WNN	48	WØTKX	47
W2MEU	46	W6ANN	45	WØKYP	47
W2RLV	45	W6TMI	45	WØHVW	45
W2IDZ	45	W6IWS	41	WØMVG	44
W2FHJ	44	W6OVK	40	WØJOL	44
W2GYV	40	W6GCG	35	WØTJF	44
W2QVH	38	W6BWG	29	WØWKB	43
W2ZUW	35			WØJHS	43
		W7HEA	47	WØPKD	43
W3OJU	46	W7ERA	47	WØIPI	41
W3NKM	41	W7BQX	47		
W3MQU	39	W7FDJ	46	VE3AET	43
W3RUE	37	W7DYD	45	VE3ANY	42
W3OTC	37	W7JRG	44	VE1QZ	34
W3FPH	35	W7BOC	42	VE1QY	31
		W7JPA	42	XE1GE	25
W4FBH	46	W7FIV	41	CO6WW	21
W4EQM	44	W7CAM	40		
W4QN	44	W7ACD	40		
W4FWH	42				
W4CPZ	42	W8N8S	46		
W4FLW	42	W8NQD	45		
W4OXC	41	W8UZ	45		
W4MS	40	W8CMS	43		
W4FNR	39	W8BFQ	42		
W4IUJ	38	W8YLS	41		
W4BEN	35	W8RFW	41		

Calls in boldface are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.

open-wire line, was connected across the balanced end of the balun. This brought the interference down to the point where the set has to be tuned off the TV signal for it to be heard. No interference can now be found in an adjacent house only 10 feet away. In addition to W5NSJ, W5s WQS FAG FPB ZFS and EDK are also on 420, or about ready to be.

W5SCX, Ardmore, Okla.: Daily checks on 144 Mc. with W5AJG, Dallas, 100 miles, and W5ATW, Waco, 175 miles, and occasionally with W5AXY, Austin, 275 miles. April log shows 95 contacts, of which only 11 were under 100 miles. Eighty-one were over 100 and 3 over 200 miles.

W9LEE, Westboro, Wis.: Daily skeds continue on 144 Mc. with WØBBN, Grand Marais, Minn., 0745 and 2100 CST. OBS transmissions are beamed west at 1955 and southeast at 2000 daily, except Monday and Friday.

Strays

WN4BXV volunteers another speedy-QSL incident: A card from WN1ZTZ, confirming an April 3rd (2 P.M. EST) QSO, arrived postmarked April 2nd.

How's DX?

(Continued from page 68)

Hereabouts — W2BXA collected the first WAB award — Worked All Brazil — issued to a W. It took Ben about 18 months to work his clinching PY call area, according to word received by W1WPO . . . . OX3s LS and RA are new Greenlanders, licensed and available . . . . Ex-WL7BAK's first five days as KL7BAK netted him 9 countries, 15 states and three VE provinces. He's 15, notes W1YYM . . . . W7PFI has our thanks for the idea behind this month's Jeevesie . . . . Those still shy FP8 contacts will be glad to hear that K2CPR has slated a July visit to St. Pierre. Jack intends another bountiful performance as FP8AA on 40 c.w. . . . . Back home from Greenland and "T-3" comes W5PPI. Despite intermittent radio black-outs, KF3AB continues to handle loads of traffic with W9NZZ, W2LXP, VE8s MA MC and others. W5PPI would have worked more Ws and DX from Fletcher's Ice Island but "spare" operating time was negligible . . . . WGDXC's *DX Bulletin* has news of XE4PK operation on Revilla Gigedo. This Mexican Pacific group is not to be confused with the Revillagigedo Island off Alaska, but undoubtedly will be. XE4PK evidently prefers 7-Mc. 'phone . . . . W5RX and W6CAE desire hints on how to scrape up FO8AC QSLs. W5RX is out of ideas on the subject. Study of W2QHH's *modus operandi* may be appurtenant to such difficulties for Howy has 224 worked and 224 confirmed . . . . W9AVJ, Salt Creek Radio Club (Ill.) station, appeared on a TV network (not TVI!) during its schedules with FO8AJ/MM. With W9NZM operating, the outfit gave televiewers a well-turned show. W9s GVZ and PKW also operate W9AVJ regularly . . . . WØKBD seeks a lift toward OE13USA and VP7NB QSLs. EA3GF likewise for KL7TF, KZ5s BC IL CH CP, W7s CSW PQE RGS RT and W9IPX/7 pasteboards . . . . To clarify the record, let us acknowledge that FS8PR, one Pierre Roblot, was active postwar on Clipperton atoll as early as November of 1945. At this time U. S. amateurs had just been readmitted to the 10-meter band and the reopening of 20 and 40 meters was many months away. Therefore FO8AJ's April activity undoubtedly constituted the first solid opportunity for DXers to contact Clipperton Island, prior ice-breaking notwithstanding.

Hints & Kinks

(Continued from page 39)

SOURCE OF HUM IN OLD RECEIVERS

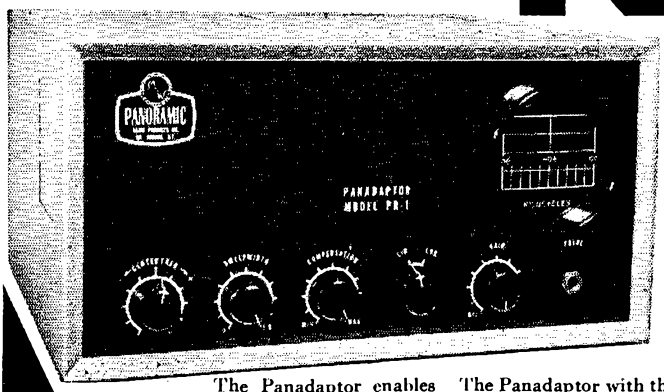
My six-year-old receiver, after traveling all over the country without benefit of normal servicing, finally required a complete overhaul. One of the most obvious defects was the strong a.c. hum that appeared consistently in the output of the set.

Although all new capacitors — both paper and electrolytic — were installed in the receiver during the overhauling process, the hum was found to be just as bad as ever when the set was turned on. After much checking, the trouble was traced to defective ground connections.

This particular receiver is one of the type that utilizes the metal mounting rings for the tube sockets as ground tie-points. These rings are in turn fastened to the chassis by means of rivets. During the years of use, the rivets had worked loose, thus allowing a coating of oxidization to form between the rings and the chassis. Naturally, a set of very poor ground contacts was the result. A little solder between the rings and the chassis did the trick as indicated by complete elimination of the hum.

— *Lee Dilno, W7UTX*

NEW



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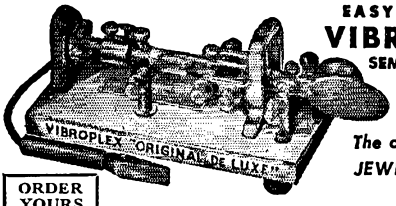

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- Q-Max provides a clear, practically loss-free covering, penetrates deeply to seal out moisture, imparts rigidity and promotes electrical stability. Does not appreciably alter the "Q" of R-F coils.
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In 1, 5 and 55 gallon containers.

Communication Products Company, Inc.

MARLBORO, NEW JERSEY
(MONMOUTH COUNTY)
Telephone: FReehold 8-1880

M. A. R. S.

MARS Active in Hawaii

MARS in Hawaii now stands ready to serve in any emergency.

MARS-Hawaii functions as a secondary radio net ready to aid military commanders, Red Cross representatives and other officials charged with emergency responsibilities during any crisis.

In the U. S. Army, Pacific area, there are 87 MARS stations including those as far west as Yap in the Carolines, manned by soldier and civilian amateurs.

Main traffic handled by the local network is that for the Red Cross. Also high on the list are Army Special Services and Chaplain messages.

The goal of MARS, USARPAC, is to establish stations in every military area; similar stations on every island, district, and locality; and the coördination of all these stations into networks as parts of an integrated system.

Primary utilization of the Hawaii network at present is the transmission of messages to the mainland and acting as a relay point for messages coming in from the Far East.

Now being organized on a large scale locally as a "potential in the event of disaster" are the mobile amateurs of Honolulu. These consist of MARS members with car radio equipment.

In addition to message handling and mobile work, MARS has set up a code course for both civilian and military personnel at its station located at Fort Shafter, Hawaii. More than 280 applications were received for the first course. Of the 280 only 20 could be accepted because of space limitations.

At the end of the course, students will be urged to take the FCC exam for amateur radio operator licenses. Hawaii MARS is under the direction of Major Gerald T. Houghland.

Youngest Air Force Mars Member

When MARS lowered the age limit from 21 to 16 for civilian members on November 26, 1953, the interest shown by the younger amateurs was tremendous.

One of the most active, and youngest member, of Air Force MARS is John H. Bauer, AF4AWM. John, who is not quite 17, resides in Asheville, North Carolina, and participates regularly in Eastern Net No. 2.

Tenth Air Force Presents Award

Since April, 1953, the Tenth Air Force has been presenting a "Station of the Month Award" to the outstanding MARS member each month.

The award for January, 1954, went to Sergeant Harold V. T'Kack, AFØLFI, a member of the Air Force Reserve residing at 1014 North 26th Avenue, Minneapolis, Minnesota. This award is based on participation in organized net drills and general coöperation of the member concerned.

U. S. N. R.

A survey has indicated that more than twice the number of amateur radio operators participated in this year's Armed Forces Day radio activities than ever before. Approximately 350

Naval personnel participated in the military-to-amateur test on Armed Forces Day from Naval Communication Station NSS, Washington. Seated, left to right, are F. A. Tomaselli, RM2 (W3SYL); D. C. Jensen, CTC (W3PTZ); Cmdr. K. R. Medrow (W3MCG); R. D. Jaeger, CT3 (W9WMA); G. A. Phillips, CTC (W3HNY), and Lt. Cmdr. T. E. Turnipseed, traffic division officer. Standing are Cmdr. M. G. Porter, communication officer, and Lt. R. F. Herbig (W3RHF).

QSL cards will be issued as a result of the military-to-amateur test with Naval Radio Station NSS, Washington.

Considerably increased interest was also shown in the radioteletypewriter competition, which was first instituted by the Navy last year. The Army, Navy, and Air Force will issue complete results of Armed Forces Day amateur radio activities in a subsequent edition of *QST*.

Captain M. H. McCoy, USN, commanding officer of Naval Communication Station NPG, San Francisco, observes W. B. Day, RM1, USN, transmit the Armed Forces Day message from the Secretary of Defense.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST *are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS. Radio publications. Latest Call Books, $3.50. Mrs. Earl Mead, Huntley, Montana.

WANTED: Cash or trade, fixed frequency receivers 28–42 Mc. W9YIY, Troy, Ill.

WANTED: All types of aircraft radios, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

DON'T Fail! Check yourself with a time-tested Surecheck Test. Novice, $1.50; General, $1.75; Amateur Extra, $2. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

WANTED: Early wireless gear, books, magazines and catalogs before 1925. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

TUNING shafts for ARC5, 274N, ARN7, ARB, RU16, $2.00; MC211A, right-angle for tuning shafts, 35¢; MC136, $2.50; SCR274N, racks and mountings, $1.00; BC348 potentiometers, $2.00. All new. L.I. Radio, Box 474, Montrose, Pa.

CODE slow? Try new method. Free particulars. Donald H. Rogers, Fanwood, N. J.

POSTCARD brings you free information on our new Amateur Desk Signs and money-saving club purchase plan. Hawkins Distributing Co., Paquatuck Terr., East Moriches, N. Y.

SELL: KW, BC221 VFO, bandswitch exciter, pp. 813, TVI filter, antenna tuner, $250; cannot pack or ship. W5QLV.

FOR Sale: QST magazines: 1946 through 1952. In perfect condition. Speech amplifier. Mrs. Darrell Downard, Watterson Trail, Fern Creek, Kentucky.

VAN Sickle displaying all National receivers, offers big trades, easy terms. W9KJF, Gene Van Sickle, Van Sickle Radio Supply, Ft. Wayne, Indiana.

ATLANTIC City vacation. Kilowatt accommodations at low power prices. Luxury rooms with private bath and radio, or budget special rooms with running water. Garden-like atmosphere in quiet location yet near everything. Write for information or reservations. Commodore Hotel, 715 Pacific Ave., Atlantic City, N. J. Phone 4–6993, Ben Robin, W2BIG, Manager.

SURPLUS specials! RG-8/U Cable 100 ft. $5.95, 250 ft. $13.25, 500 ft. $25.00. Coaxial Connectors — PL-259 5 for $2.25, SO-239 5 for $2.00. New tubes — 807 — $1.65, 811A — $4.25, 812A — $3.50, 813 — $10.50, 866A — $1.48, 304TH — $8.75, 872A — $3.95, 24G — $1.85. Postage extra. Request free bulletin and visit our new store for thousands of bargains. Want to buy or swap: Selsyns, Synchros, Servo Motors, Amplidynes, RTA-1B Aircraft Radio. Lectronic Research, 719 Arch St., Philadelphia 6, Pa.

WANTED: Measuring and testing equipment and VFO. Ken Miller, W8LSA, 1108 Clearview Ave., Parma 9, Ohio.

WANTED: Early wireless gear, books, magazines and catalogs before 1925. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

MICHIGAN Hams! Amateur supplies. Store hours 0800 to 1800 Monday through Saturday. Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Phones 8696 and 8262. Roy J. Purchase, W8RP-Leroy Reichenberger, W8LJD-Edmund E. Gunther, Jr., W8HMW.

URANIUM. Big samples. Radioactivity guaranteed. One dollar. No stamps. E. E. Fletcher, W5WRS.

URGENTLY need AN/APR-4 items. New high prices. Littell, Far Hills Branch, Box 26, Dayton 9, Ohio.

QSLS? SWLS? America's finest and largest variety super-gloss QSLs!! Samples 25¢ (refunded). "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Michigan.

QSL's-SWL's Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSLS-SWLS, 100, $2.85 up. Samples, 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS-SWLS. Quality, Variety, Reasonable. Samples 10¢ (refunded). Joe Harms, W2JME, 225 Maple Ave., North Plainfield, N. J.

QSLS of distinction. Three colors and up. Uncle Fred, Box 86, Lynn, Penna.

QSLS, Glossy. Samples, 10¢. W1OLU Press, Heckbert, 30 Magoun Ave., Medford, Mass.

QSLS. Samples, 10¢. C. Fritz, 1213 Briargate, Joliet, Illinois.

QSLS, SWLS. Special! 2-color card, $4.25. Free samples! Acme Printers, 707 West 8th, Los Angeles 17, Calif.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSLS-SWLS, Samples free. Backus, 5318 Walker Ave., Richmond, Va.

QSLS: New — Beautiful. Samples 10 cents. Graphic Crafts, Route 12, Ft. Wayne, Indiana.

QSL-SWL cards. Sensational offer, Bristol stock 500 1 color $3.95, 2 color $4.95, 3 color $5.95. Super gloss $1.25 extra. Rainbow cards. Samples. QSL Press, Box 71, Passaic, N. J.

QSLS. Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

QSLS! Two colors, $2.00 hundred. Samples for stamp. Rosedale Press, Box 164, Asher Station, Little Rock, Ark.

QSLS: 150, $2.00. Samples 10¢. Credited. Bob Garra, W3UQL QSL Service, 414 Mahoning St., Lehighton, Penna.

QSLS, SWLS. High quality. Reasonable prices. Samples. Write to Bob Teachout, W1FSV, Box Q124, Rutland, Vermont.

QSLS-SWLS. Samples, dime. Bartinoski, Burlington, Vt.

QSL's, SWL's. Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 423 Barker Bldg., Omaha, Nebraska.

QSL samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSLS-SWLS, samples, 10¢. Malgo Press, 1937 Glendale Avenue, Toledo 14, Ohio.

QSLS. Taprint, 205 South, Union, Miss.

QSLS, Amateur radio's favorite QSL printer. Samples catalog, 25¢ refunded. Stronberg, P.O. Box 151, Highland Sta., Springfield, Mass.

QSLS! "America's First Choice!" Samples 10¢. Tooker Press, Lakehurst, New Jersey.

QSLS, samples free. Fenstermacher, W9ZFD, P.O. Box 254, Steger, Ill.

QSLS. Quality with economy. Samples 10¢. Stinnette, W4AYV, Umatilla, Florida.

QSLS: $30,000.00 for one million (also sold by the hundred). Ham's new "Super-Speed Specials" are FB. Samples 10¢. Robinson, W9AYH, Dept.-R, 12811 Sacramento, Blue Island, Ill.

QSLS. We've printed a million for hams all over the world. Samples 10¢, refunded. V.Y.S. Print, 1704 Hale, Ft. Wayne, Indiana.

QSLS. Beautiful 3 colored, for $2.85 per 100. Samples for stamp. Fast service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

SWAP or sell: NC-125, like new; RME-43, WØFCT. John Andersen, Ord, Nebraska.

USED 5820 image orthicon tubes. $50.00 each. Fine for amateurs or experiments but resolution substandard for commercial TV. J. M. McDonald, W8HF, 140 West 9th St., Cincinnati 2, Ohio.

PERFORATED Sheet Aluminum 18 gauge with 1/16" holes. Easily worked with hand tools or cut to your pattern. Perfect for shielding. One dollar per square foot. Minimum order four feet. Write for bulletin. Nortmann-Duffke Company, 2740 S. 32nd Street, Milwaukee 46, Wisconsin.

REMEMBER Blossomland Amateur Radio Association's Hamfest picnic, July 25 at Warren Dunes State Park, 15 miles south of St. Joseph, Michigan on U. S. 12. 10 meter transmitter hunt. Bring gear for swap and shop. Registration fee $1.00 in advance or $1.25 at park. Advance registration through Al Carpenter, WN8ORM, Secy.-Treas., St. Joseph, Mich.

SSB FT-241-A crystals. Individually activity-tested, measured, marked exact true frequency. Guaranteed satisfactory, $1.00. Orco Products, Box 51, Downey, Calif.

WANTED: Workingman jeweler, will trade lady's finest quality diamond ring set, certified appraisal of $375.00 for commercially built multiband mobile transmitter and power supply, converter, antenna and coils, or complete mobile station. Will pay freight. John Brownston, W6LPN, 5629 El Granero Way, Sacramento, Calif.

NOVICE transmitter, Hammarlund 420, all bands, 55 watts, coils included. Ameco Jr., Senior code course, $50 takes both. Leonard Meadows, 7410 Ridge Blvd., Brooklyn, N. Y.

FOR Sale: Hallicrafters HT9 transmitter for best offer. Everett A. Erickson, W1NLM, Oakland Heights, Bethel, Conn.

VIKING II sale. Factory wired, like new, less than year old: $260.00 J. A. McAllister, W4RSX, 1012 Wakefield Drive, Alexandria, Virginia.

WANTED: Old copy of "How to Become" booklet issued around 1930. Also want old radio catalogs of 1920–1925 vintage. E. V. Brant, 1161 Delaware Ave., Detroit 2, Michigan.

WANTED: Diathermy unit, complete, also large cabinet rack. Nash, W8LJW, Star Route, Sanford, Michigan.

WANTED: Viking I transmitter. Advise price, condition, final, etc. Bill Vietor, W7PMC, Phillipsburg, Mont.

FOR Sale: TBS-50 with APS-50 a.c. power supply, $90. J. Taylor, W2OZH, Stanwood Road, Mt. Kisco, N. Y.

NEED more power? Have ART-13, less power supply, also 500 watt pair 813's final 811's modulators, 'phone/c.w. with husky power supplies. Will sell or trade for de-TVI'd Viking, Collins, or Globe King. Am in a fringe area. W5HRZ, Box 281, Sentinel, Okla.

FOR Sale: DuMont 3" 'scope recently factory checked, with new tube. First $50 takes it. W1CPI.

W2BFD cleaning house. Send for list of relays, meters, sideband filters, auto-tune motors, etc. Recording wire, $1.30 per hour. For Webster and all popular wire-recorders. ½ hour spools, 80¢. Minimum order 3 hours of wire. Williams, W2BFD, 38–06 61st St., Woodside, L. I., N. Y.

SELL: Hallicrafters S-20R, $50; ½ k.w. PP811 final and driver, 40 & 20 m. coils, $100; power supply 1200 v. @ 300 ma., 375 v. @ 200 Ma, $75; transformer 2500 d.c. @ 600 ma., $50; 35" rack cabinet, $15; W4RFK, 1611½ Oberlin Road, Raleigh, N. C.

FOR Sale: Gardiner S automatic sender, practically new, with 10 tapes: $22 pp. Ted Long, W3UJF, R.D. #5, Bloomsburg, Penna.

FOR Sale: Meissner signal shifter, pre-war, coils for 20, 40, 80, and 160: $20; Gonset converter 10–11, $5; RME DB-20 Pre-selector, $15; Pilot AM/FM tuner with Heathkit audio amplifier, $35; Vibropled Deluxe bug, $5; ½ k.w. power supply and r.f. components; Heathkit communications rcvr with cabinet, $20. J. F. Driscoll, W2SSC, 173 Florida St., Buffalo, N. Y.

HQ-120X, just reconditioned, $100 F.o.b. L.A. W6TMT, 6415 West 89th St., Los Angeles 45, Calif.

TRADE or sell: Model 12 teletype with synchronous motor, table, cover, stand and polar relay. Tape perforator, distributor and tape transmitter with three polar relays. All converted, wired and ready for operation. Excellent condition. Bennett, W4EBH, 328 West Whitlock Ave., Winchester, Va.

SELL: Factory wired de-TVI'd 60-watt Eldico TR75TV and A.m. 40 mod. with coils 80–75; 40 20 with manuals, $110. W2NJA, P.O. Box 495, White Plains, N. Y.

SELL: PE103A dynamotor w/cables, excellent condition, $20; BC459A xmitter (7–9.1 mcys) w/tubes. $5.00. F.o.b. W8RAW, 555 Hollis Road, Ypsilanti, Mich.

CONVERTED SCR522 xmitter/rcvr rack and panel, meters and xtals, power supplies, ready to go on air, $100; Dynamotor 425V 375 mil., $20; ATR Alliance Tennarotor, $15; S. Casey, W2IFR, 169 Hall Ave., Perth Amboy, N. J.

FOR Sale: AR88D receiver, immaculate condition. Offers considered over $300. Aitkens, 421 Hinton, Ottawa, Ont., Can.

WANTED: March, May, June 1916 *QST*. Sell: four or more *QST*s 1930 to date, 25¢ each. WØMCX, 1022 N. Rockhill Rd., Rock Hill 19, Mo.

SELL: NC-101XA receiver, 160 thru 10 meter bands. Each band full dial spread. Eleven tubes, xtal filter, S meter, separate 10" speaker, original wiring, in excellent condition. $50 F.o.b. Owensboro, Ky. Newhall, W4ISJ, 2126 Griffith Place West.

HRO 60 coils A, B, C, D, E, and F; crystal calibrator Select-O-Ject less speaker, in excellent condition, $500. F.o.b. Baltimore. R. E. Ridenour, 839 Wildwood Pkwy, Balto 29, Md.

WANTED: RCA K.w. mod. xformr, ART-13 mod. xfrmer with s.w., 2500 v. 500 ma., xformer or 2250 v. 500 ma. comp. supply for P2813's; BC453, Q5'er. State price, condx. "Judge", WØLMB, Bridgewater, S. D.

QST in Binders, 1941–46 inclusive; first $30 or best reasonable offer. Without binders, if desired. Leroy Barber, W8RKU, Rte. 1, Leipsic, Ohio.

FOR Sale: Brand new BC696 in original carton. Twenty dollars. WØUWG, 1311 West 5, Winona, Minn.

SX62 with RA6 speaker, almost new, guaranteed perfect: $225. Prop pitch rotator, $15; Selsyens, $12 pair. Freq. meter, $20. F.o.b. Tampa, Fla. Cash. Van Slyck, Rte. 6, Box 575, Tampa 4, Fla.

WANTED: TBV, BC222, etc W2EEY, Schultz, 1829 Cornelia St., Ridgewood 27, N. Y.

FREQ-meter I-222, new, 8–15; 145–230 mc with xtal, chart, schematic, 110V A.C., coax input and output 0–1000 micro v. out, int. mod., $45.00; 110 v. a.c. in, 28 v. 10 a. out, Stancor, $25; Kellogg dial telephone, $10; McColpin Christie 220 v.a.c., in 28 v. 50 a. out; BC610 plate xfrmr, new, NC183D w/spkr, $300; Want: RME-45, SX-71, Panadaptor 2m. mobile rcvr. W7NVV, Art Weart, 841 Markea, Salt Lake City 2, Utah.

SELL: Mims sig. squirter, 10/20. Complete. 5333 Waterman Ave., St. Louis 12, Mo. W. K. Gardner.

FOR Sale: Collins 310B1, all coils, manual, tubes, spare 2E26, 5R46Y, 3 6AG7s, TVI'ed, $200.00 F.o.b. Rockford, Ill., W9HP, 5328 East Dr.

FOR Sale: Complete mobile rig, 10820 meter transmitter, Dynamotor, mike, antennas, relays, etc. First $65.00 takes all. J. R. Driver, W4ZRS, 6419 Fitzhugh Ave., Richmond, Va.

WILL sell SX24 recvr, in good condx: $40; two BC645 new, in orig. cartons, $25 each; other parts and gear for sale. Write for list. Art Vandervoort, W2DGG, P.O. Box 271, Bloomingdale, N. J.

TRADE Ekotape, Mod. 116, tape-recorder for 50–75 watt c.w. and phone (xtal/v.f.o.) transmitter, complete with power supply and antenna tuner. H. G. Coleman, 3146 Middlesex, Apt. A., Toledo 6, Ohio.

ROTAR inductor, with counter, suitable for k.w., $10. Novice transmitter receiver, 40–80, 50 watt, $48.00. 18 watt 10-meter mobile with power supply, $35.00 One amp. r.f. meters ideal for mobile, $2.00. Need: 4–250A, 3000 v. .400 ma. transformer, W2AEV, Jones, 14 Carol Rd., Bethpage, L. I., N. Y.

HOTTEST Ham List in the nation! Trade-ins and closeouts of all leading Amateur brands including Collins, National, Johnson, Hallicrafters, Gonset, Elmac, Morrow, Harvey-Wells, RME, Millen, Meissner, Sonar. We trade and offer our own time payments tailor-made for you. All leading brands of new equipment in stock. Write for latest bulletin. Stan Burghardt, WØBJV, Burghardt Radio Supply, Inc., Box 41, Watertown, South Dakota.

FOR Sale: Leece-Neville alternator 6v., 80 amp. Complete with rectifier, meter, voltage regulator, one year old: $135.00. G. Golden, W1OZ, 125 York Terrace, Brookline, Mass.

FOR Sale: BC348Q rcvr, ant. trimmer, S meter, extra audio in gud condx: $60; BC453, Q5er unconverted, $15; BC454 80M rcevr unconverted, $12; 40M rcvr, partially converted, $12.00; 12V Winco dynamotor 440V, .200A, new, $15.00. 1 KVA polepeg transformer, $15.00; BC696 80M xmittr, unconverted, $15. L. R. Zander, W6ITE, 1212 Antonia Way, Bakersfield, Calif.

NEED schematic for Navy rcvr, Mod. NC100 A.S.D. Who has one? Duncan Kreamer, W2JMG, 183 Kearney, Paterson, N. J.

SELL: Hallicrafters SX-43 and R-44 matching speaker, $135.00 F.o.b. Wencil Kopecky, 1502 K St., S.W., Cedar Rapids, Iowa.

TELEVISION set, 7", $30.00. Suitable for monitor. Have couple larger. Want TV camera equipment. W4API, 1420 South Randolph, Arlington 4, Virginia.

WANT: 450THs; have BC1306 75-meter mobile station, $90. W6WZD.

SELL: National N.H.U. receiver band switching 20–15–11–10–6. Unusually sensitive, $95.00. Six volt Leece-Neville alternator with rectifier and regulator, $95; new Central Electronics sideband slicer, with API adapter, factory wired, $75.00. W2VH, Haus, 25 Upland Drive, Chappaqua, N. Y.

TRANSFORMERS while they last! 550VCT @ 90 mile with 6.3VCT @ 3½ A, cased, $2.00 each; 700 VCT @ 90 mile with 6.3VCT @ 3½ A cased, $2.20 each; 5260VCT @ ½ amp. ICS, $40.00 each. Grand Transformers, Inc., 226 Washington St., Grand Haven, Michigan.

COLLINS 310B1 for sale: $200. Completely de-TVI'd.; SX28A, $90, postwar; 80/100 watt 2-meter xmitter, complete wid Mod. $85; Millen exciter 6L6/807, $15; LM freq. meter 110V power supply, $75; BC453, never converted, $15. C. D. Gehrke, W9REQ, R.R. 1, Chippewa Falls, Wis.

URGENTLY needed: Prop pitch motor, new or used. Must be in good condx. W8CED, Melvin, 71 Seminole Trail, Willoughby, Ohio.

SX28, for sale in A-1 condition. Will ship prepaid upon receipt of check for $100.00. W3BQP, H. S. Conard, Glen Mills, R. D. 1, Penna.

SALE: TBS pwr supply, $25.00; BC221, $35; VHF 152, $35. WØGPE, Nelson, Fort Crook, Nebr.

CHICAGO area: less than half price. Recent Viking I, de-TVI'd, VFO, Monitone, break-in and push-to-talk, D104 mike, coax relay, Johnson low-pass, SWR bridge, Millen pre-amplifier, Select-O-Ject, Elincor 10 meter 3-el. beam, remote reading rotator, 18 ft. Alprodco tower, grid dipper, $305 takes all. Write for appointment. W9QQO, Marsh, 155 Franklin, Crystal Lake, Ill.

TBS-50-C with hi-gain outboard mike amplifier and A.C. power supply, $100. DPS-50 dynamotor with connecting cables and push-to-talk mike, $60.00. Gonset Tri-band converter with noise limiter, $30.00. National NC-125, $150. All equipment in new condition. W1ERX, 34 Emerson St., E. Norwalk, Conn.

SCR211AK mod. freq. meter, best cash offer. Howard A. Scott, 8957 Madison Ave., Jacksonville, Fla.

TELETYPE: Sell Model 12, complete. W6DOU, 1558 "B" Street, Hayward, Calif.

MOBILES! Reflectorized aluminum call-sign. Regular 2" x 5", $1.50; Jumbo 4" x 12", $2.00. Overnight service. Whitley, W2LPG, 133 Airsdale Ave., Long Branch, N. J.

SELL: HQ-140-X, just like brand new, in original carton and $38 12" Jensen speaker, all for $210.00 expressed. Ross Thorp, 23836 Cherry Hill, Dearborn, Michigan.

HT-9, $165. Late grey model; coils for 10–20–75, first class condx. J. Devaney, W9FVF, 572 Hickory Rd., Glen Ellyn, Ill.

FOR Sale: NRI course in communications. Richard E. Snyder, W8JKX, Box 37, Spring Arbor, Mich.

SALE: 300-watt phone/cw transmitter. Bandswitching 80 thru 15. Best offer takes it. Local sale is preferred. E. E. Carlsten, W3KUC, 507 Margaret Dr., Silver Spring, Md.

PLATE Transformers rewound (over 300 watts). Save half. Guaranteed work. W4CLJ, Price, 411 Gunby Ave., Orlando, Fla.

STANCOR 100 watt transmitter, $120; Harvey-Wells deluxe with pwr supp., $100; Motorola T69-20A, 10-meter mobile xmittr and Morrow 2BR converter, $100; Eico signal generator, $30; 100 Kc oscillator, $6.00; RCA-Victor 45 rpm phonograph $25. W6VC, 841, 47th Ave., San Francisco 21, Calif.

SELL: NC-125 w/spkr, $120; R23, new, w/dynamotor, $25; Instructograph AC, $25; BC696 coil set, $4.50; 1415 Kc ifs, $1.35 set; PE101C, new mechanical modified, $4.50; all F.o.b. Dumont. Need: BC348Q and TM for 348R. M. J. Marshall, 455 Washington Ave., Dumont, N. J.

SELL: National 2-40-D receiver with speaker. In excellent condx: $125. W2HTD, Wright, 86 Brook Road, Red Bank, N. J.

FOR Sale: 4 months old HQ-140X, like new, with speaker, $235. A. P. Markland, W1TSI, Stoors, Conn.

FOR Sale or trade: Pair 833A's, new, $20.00 each; pair 4E27's, new, $7.50 each. Want 600 watt multi-match modulation transformer. W4PNF, 760 Poole Drive, Fayetteville, North Carolina.

SELL: Complete 10M Motorola T-69-20A Transmitter with dual vibrator power supply: Gonset tri band converter: Webster Electric 18–50, 50 watt P.A. system. Col. Chatfield, W4BXE, Redstone Arsenal, Huntsville, Ala.

FOR Sale: Meissner EX Signal Shifter, $44.50, Lysco "600" 40W VFO $89.50, Temco 75GA 125W Xmtr Complete Fone & CW VFO 10 thru 80M, $225.00, 40W All Band RF amp. $19.50. All Guaranteed A-1 condition. Want SS equipment; DB Preselector; W6SRF, 3519 Andy St., Bellflower, Calif.

SELL: 76" Racked KW PP 813s w/ 805s RCA Mod. 2 Power w/ Powerstat, 5 Meters. $300.00. FOB Berea. W8GAV, Sam Steele, 79 Hamilton St., Berea, Ohio.

SELL. S-40B Rcvr $70.00. Globe Scout 5 sets coils $70.00. Harvey Wells VFO $37.50, Lysco Ant Tuner $9.50, JT-30 mike $6.00. W4ZZC, Box 373, Clarkton, N. C.

WANTED: Johnson Viking II and VFO factory wired, or similar transmitter in A-1 condition, no junk. Mason Booth, 4423 South Rockford, Tulsa, Okla.

WANT: QST — 1946, 1947, 1948; CQ — 1946 thru 1949. Must be reasonable. C. Storch, 5 Winfield Terrace, Great Neck, L. I., N. Y.

SELL: Like new, Collins V-2, 75A-1, D104 Mike, Low pass filter, All or part, best offer. Dr. M. Gordon, W2UKV, 201 Barberry Lane, Haddonfield, New Jersey.

SWL's — Novices: Sell Hallicrafters S-53A, in excellent condition, less than a year old, small amount of use. Will pay shipping charges: $55.00. KN6EDX, 1016 Sunnybrook Drive, Lafayette, California.

REAL Bargains: New and reconditioned Collins, National, Hallicrafters, Johnson, Elmac, Gonset, Babcock, Morrow, RME, Millen, Lysco, others. Reconditioned S38 $29.00, S40A $69.00, S76 $129.00, NC57 $69.00, NC88 $89.00, NC125 $129.00, NC183 $199.00, HRO50T1 $299.00, HRO60 $399.00, HQ129X $169.00, SP400X $249.00; VHF152A $39.00, RME45 $99.00, Gonset Tri-band $29.00, Super-Ceiver $89.00, Commander xmitter $89.00, S40B, SX71, SX28A, SX42, SX62, HFS, HRO5, HR07, Collins 75A1, 75A2, 32V2, 32V3, Viking II, Harvey-Wells Bandmaster transmitters, others. Shipped on trial. Easy terms. Satisfaction guaranteed. List free. Henry Radio, Butler, Mo.

FOR Sale: SX-71, $165; R-46, $15; Bud low pass filter, $10; Lysco 50 antenna tuner, $10; VFO with 80–40 meter output, $20; regulated power supply, $15; 45 watt cw-phone transmitter, complete with all coils, best offer. W5WXJ, 624 13th Ave. No., Texas City, Texas.

SEE you at Hamfesters Radio Club 20th Annual Picnic and Airmobile Meet at Mance Park near Chicago on Sunday, August 8th. Donations, $1 to August 1; $1.25 after.

FOR Sale: Hallicrafters S40B late model, like new. $85.00. Also, 50 watt c.w. transmitter, good condition, $40.00. Perfect Novice rig. William Risch, Mastic Beach, P. O. box 581, Mastic Beach, Long Island, N. Y.

FOR Sale: Stancor 203A Transmitter $30; Gonset Triband, $25.00; Noise Limiter, $5. Lawrence H. Lapinske, Box 179, Wausau, Wisconsin.

FOR Sale: Millen 90810 transmitter $50.00. New 60 watt multimatch modulation transformer $30.00. Two new plate transformers-5200 VCT at 400 ma. each, $30.00. Six Pyranol condenser 2 mfd. at 4000 volts, each, $5.00. LM 7 frequency meter, $65.00. Six 813 tubes each, $7.00. 4E27 tube $6.00. A. Ostrochovsky, W2UPV, Rear Ave. Extension, Hawthorne, N. J.

COLLINS 32V2, modified to V3, including LP Filter and co-ax relay, delivery — reasonable area, $525.00. Pre-war Meissner ECO, coils 80–40–10, some modifications, $25.00. VHF 152, little used, $35.00. Mobile/fixed xmtr, 829B final, all circuits metered, cabinet similar to Bud C 1792, operates on AC or DC, cost over $200 to build from all new components. Complete with PE 103 and built in AC supply, coils for 80–10, 25 W DC — 18 W AC $75.00. E. S. Grainger, W2NXZ, Box 186, Brightwaters, L. I., N. Y.

WANTED to buy: NC-240D with speaker. Must be in top clean condition. Will pay top price cash. Write J. G. Lehmer, W9VVV, 711 S. Sixth St., Champaign, Illinois.

750 WATT Kohler generator, 115V, A.C. 60 cycle. Less than 65 hours running time. Has 12V automatic battery starter; fully automatic controls and overload switches; 12V Mallory charger & 12V battery included. In perfect condition will guarantee 100%. All equipment is mounted on a sturdy steel frame 18" x 27¼" x 25" high. Will send photo on request. Swap for like new 300–600 watt xmtr (factory built). Morris A. Booth, WN8NWI, Alden, Michigan.

SELLING out: Super-Pro SP-200 w/pwr/spkr/rack $90; Meissner 150 B wo/exctr $85; LM-15 w/pwr/book $75; 4E27 $5 (4); UTC 8S-60 5v 22a 10kv ins $5 (4); UTC LS12X line-grid $10; hundreds other tubes/parts. Heavy gear local only, rest F.O.B. K2BEX, 102 Roosevelt Court, Carle Place, L. I., N. Y.

ELDICO TR75TV3, little used, with four crystals, two coil sets perfect. $45; matching MD40P modulator kit, never assembled, complete with crystal mike, $45. Consider trade on Leica lenses or Gonset Communicator. W8SQS, 3826 Strandhill Rd., Cleveland, Ohio.

SELL: Harvey Wells Bandmaster with ACS-50 power supply $90.00. Also, RME HF 10–20, $40.00. W9KXM, 810 Emerson, Beloit, Wisconsin.

PERFECT Collins 32V2 with spare 4D32 $475.00 F.o.b. Richmond, Va. W4JOT, 4900 Riverside Dr.

APELCO Model DFR-7, 6 or 32 volts RCA Model AR-8711, 32 volts. Both direction finders cover broadcast, marine, and beacon frequencies. Will sell or swap for ham receiver or mobile gear. Charles Van Denburgh, W4SBU, Box 232, Warsaw, Va.

FOR Sale! RME DM36A 6&10 meter convertor, $15.00; Amphenol 10 meter folded dipole, never used, $4.00; UTC 12 Watt universal modulator transformer, new, $4.00; Thordarson T20D77 driver transformer, new, $2.00. W2CZE, 29 Mount View, Newton, N. J.

COMPLETE field set SCR-284, new condition $125.00. W8JUE, Shepherdstown, W. Va.

FOR Sale: TAJ-19 Transmitters $450.00 complete; Broadcast Monitoring Equipment; new under water ranging & sound equipment — no reasonable offer refused. 7 used 1 KW Ham Transmitters and other gear, Federal BC-325-C Transmitter-$795.00. Write for complete list & prices. Radio & Television Supply Company, Box 201, Decatur, Alabama.

WANTED: Synchros Size 3, will pay $40 each; Size 1 — $20 each, subject to inspection. Also need other types Synchros and Amplidynes. Electro, 58 Eastern Ave., Boston 13, Mass.

WE are now in our ultra modern building with fresh stocks to serve you. Bargains: with new guarantee: S-72 $69.50; S-40 $69.00; RME-45 $99.00; HRO Senior $99.00; Lysco 600 $99.00; S-27 $109.00; SX-43 $129.00; S-76 $149.00; SX-71 $169.00; SX-42 $189.00; HRO-50 $275.00; 75A1 $275.00; HT-17 $32.50; EX Shifter $69.00; Globe Trotter $59.50; Harvey Wells Sr. $79.00; DeLuxe $99.00; Viking I $199.00; Elmac A-54 $99.00; HT-9 $199.00; Globe King $295.00. We need used receivers: We give highest allowances for S-20R; S-40A; B; NC-57; NC-100; NC-125; SX-24; SX-25; HQ-129X; and similar receivers. Free trial. Terms financed by Leo, W9GFQ. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

TOROIDAL Inductors. Manufacturer's surplus. For SSB filters, FSK, stable oscillators, etc. 2-mh. to 450-mh. $2.00 each, 6 for $10.00. Write for list. D&R, Ltd., P. O. Box 1500, Santa Barbara, California.

NOVICES; 3 Detailed transmitter schematics with photos, 50¢. Matt, 2322 So. 2nd. Ave., No. Riverside, Illinois.

WANTED: Chief Engineer for Montana's most modern radio station, network affiliate, fine future, increasing power finest RCA equipment. State qualifications and experience. Contact I. A. Elliot, W7IMX, Radio Station KATL, Miles City, Montana.

WANTED: National TV7M Television set in gray metal cabinet. Please state price and condition. W9ISI, 1009 Franklin St., Danville, Illinois.

CRYSTALS? 2-Meter? Etch surplus easily, cheaply. Instructions 35¢. Brizendine, W4ATE, 1001 Merit, Old Hickory, Tenn.

SELL Hallicrafter H-17 Xmtr $39.50. BC-654 $20.00 Instructograph $15.00. Swap Leica with 3.5 lens for Gear. Want Collins exciter or what? Paul Giganti, 2429 San Carlos Ave., San Carlos, Calif.

NEW Crystals for all commercial services at economical prices; also regrinding or replacement crystals for broadcast, Link, Motorola, G. E. and other such types. Over 19 years of satisfaction and fast service. Eidson Electronic Company, phone PRospect 3-3901, Temple, Texas.

SCR-522 Transmitter Expertly converted with Power Supply, Mike and Crystals, $60.00; Simpson 260 VOM New $30.00; New Pair AX-4-125 A's $25.00; New 4D22 $10.00; Heath Grid Dipper $20.00; BC-458 on 40 Meters with Power Supply and Modulator $50.00; Power Supplies and miscellaneous parts, request list. I. Seidman, W2GNZ, 1515 Longfellow Avenue, Bronx, N. Y.

ELMAC PR6A mobile receiver, BC-160–80–40–20–10 with NL, AVC & BFO $100.00 Elmac A54 transmitter $100.00. Hickok 288X Signal Gen, $110.00, Precision 912 tester $20.00. Send for bargain list of parts. GR 724A field strength meter new 15KC to 50 MC, make offer. 30 MC FM mobile gear also 2 meter gear mobile and fixed gear FM. W3BBV, P. O. Box 722 York, Pa.

SELL NC-183D (used 4 months) $300.00; NC-125 (new) $165.00; Electronic Designs Model 100 VTVM, $25.00; Altec-Lansing Model 600B Hi-Fi Speaker in Modern Blonde Bass-Reflex Corner Cabinet $65.00; Webster 3-speed changer with G. E. Var. Rel. Cartridge and Pre-Amp. $40.00; All in Perfect Condition. FOB Dick Rice, W9LOC, 816 W. Maple, Champaign, Ill.

FOR Sale: 600 watt conservatively powered transmitter in Bud deluxe 66 inch cabinet using a 4-250A final into antenna tuner class B modulation by pair of 838s. Separate power supplies for final and modulator with Collins 310B1 as remote driver unit. Must be seen to appreciate value — $600.00. Also 1 NC183 with speaker — $200.00; 1 HQ129X with speaker — $135.00. Sil Thompson, W5BUF, 6460 Vicksburg, New Orleans, La.

WANTED: ART-13, ATC, DY-12, DY-17, CU-25, BC-342, BC-312, BC-348, BC-221, TS-173, TS-174, APR-4 tuning units, RA-20, RA-87, TG-7 teletype, keyboard perforators, TCS and parts, BC-939, BC-614, BC-610, APN-9, ARC-1, ARC-3, 32V, 75A, 310 exciters, ARN-7, manuals. Will buy for cash or trade for new amateur equipment. Johnson Viking, Ranger, Hammarlund, Hallicrafters, National, Elmac, Gonset, etc. All types electronic equipment taken in trade. Alltronics, Box 19, Boston 1, Mass. Richmond 2-0048, 2-0916.

DESPERATELY need money for college. Selling entire station (fone-c.w., 160–10), 1½ years old, in excellent condition. Lettine 240 transmitter (all coils), S-77 receiver, crystal mike. All for $190 or best offer. K2ACF/Ø, % Mr. C. I. Vessey, 610 Lake Avenue, Colorado Springs, Colorado.

FL 8 Audio filters help eliminate QRM; 2 for $2.50 prepaid or 2 for $3.00 with PL55 & JK26 attached, prepaid in US only. 6L6 tubes new in cartons JAN type $1.00 ea., OD3/VR150 new in carton JAN type $1.00 ea. BC433A compass receiver less tubes $5.00. BK22E Relay $2.00. M. D. Haines, W5QCB, 1316 S. W. Military Drive, San Antonio 4, Texas.

SELL: Like New: 1 S-38-B Receiver $25.00. 1-Browning Freq. Meter Model S-4 $50.00. 1 Carter Dynamotor 6V. In, 600V. Out at 170 MA. 1 Solar Xmitter Cond. Checker $35.00. 1 Clean PE-103-A Dynamotor $20.00. All F.O.B. WØJZP, 1506 Sunset St., Albert Lea, Minn.

FOR Sale Collins 310B1, excellent shape, $200; WØNGM, 509 Idaho Ave., Huron, S. D.

WANTED: Cash for used 10-A exciter. State condition, price. Sell: like-new Simpson 488 field strength meter, $50.00. C. W. Eckhardt, W7BBK, Ritzville, Wash.

JOHNSON Viking Ranger Kit Form $179.50 less tubes; with complete set of tubes $199.95; also available wired and tested; write for details. We trade and offer terms. Largest inventory of used ham equipment in New England; write for latest list to Carl, W1BFT, Evans Radio, Concord, N. H.

WYOMING Hamfest July 24–25. Excellent program. Tourist mobiles welcome. See "Hamfest Calendar," this issue.

NATIONAL NC183D's $279 w/spkr. Fellas, these are excellent! Electronic Labs, 2444 "D," Lincoln, Nebr.

SOUTHEAST Iowa Hams: 450 watt cw, 6L6-807-PP TZ40's, three power supplies, 42 inch enclosed rack, $125. Transmitter at former QTH. Write for details and arrangements to see. Also ST-20-A with tubes, $35. Daniel Campbell, 100 Third St. S. E. Waseca, Minn.

SELL or trade: HRO60R complete rack mounted with speaker, coil compartment, 6 coils and Collins VFO 310C1 with enclosed power supply $525.00 or trade for smaller receiver and commercial ham transmitter. Paul J. Patrick, W9ZVM, 5251 So. Pennsylvania, Cudahy, Wisconsin.

FOR Sale: 20 meter, 3 el. wide-spaced beam; large prop-pitch motor with transformer; 60 amp. Ford generator with regulator; Browning visual frequency monitor type M3-170; National Select-O-Ject; BC696 and BC459 Command transmitters; new Electro-Voice 911 Mike; Simpson 260 VOM; several of the following tubes: 100TH, VT127A, 813, 1625, 1626; new Motorola UHF Converter. Wanted: A commercial heavy-duty beam rotator. Best offers accepted. Details on request. Calvin J. Evans, W9LTR, LaGrange, Indiana.

WANTED: Set of "AA" coils for HRO50T1. Reasonable. Will swap or purchase. W3GHD Box 34, Phila., Penna.

PASS Amateur Theory exams. Check yourself with sample FCC-type questions & Novice & General class examinations. All for only 50¢. Ameco Electronics, 1203 Bryant Ave., New York 59, N. Y.

TECHNICAL Information service to amateurs at amateur prices. Interested in modern, commercial miniaturization techniques as applied to amateur receivers and low power transmitters? Want your kilowatt final with minimum TVI also in a small package? 34 years amateur radio experience (I was the original 1ECM/1BVM, 2AHR, and now W2CTB) plus many years commercial and military design experience qualifies me to help you solve your problems. None too small or too large. Arnold K. Beauchemin, Electronic Engineer, member 1RE, ARRL, 11-A Wayne Gardens, Collingswood, N. J.

75A2 Six months old perfect $350.00. Millen GDO good condx $35.00, 4-250A All band final per Handbook with new 4-250A $110.00. 72" black crackle cabinet with meter panel $35.00 local only. No trades. W2TLG, 619 Chelsea Road, Oceanside, N. Y.

75 WATT and 100 watt transmitters complete with tubes and crystal, less power supply, $35. Atlanta Electronics, Box 7193, Station C, Atlanta, Ga.

SELL Hammarlund 400X, like new, $269. Want Omega D2. R. Long, 933 E. Broadway, So. Boston, Mass.

BEAUTIFUL handpainted neckties with your handle, call and antenna towers. Henry Schanding, W3RRF, Harrington, Delaware.

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RESEARCH brings you a compact, light, economical new oven

THE JKO9 CRYSTAL OVEN

- Only 1.28" dia. x 1.70" high and weighs only 1.5 oz.
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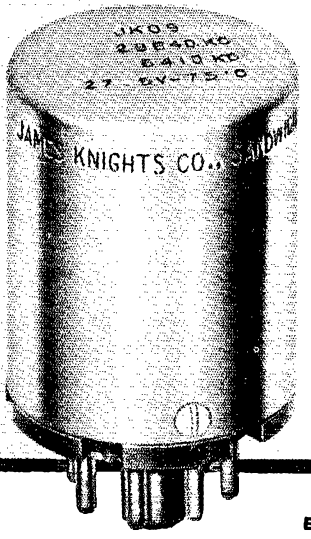
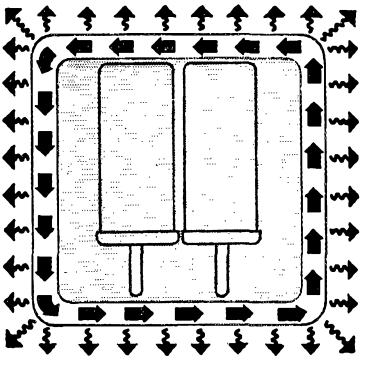
- Economical and reliable because design permits tooling for uniform production.

Patented JK "Thermaflow" Design*—Temperature, like water, seeks its own level. Instead of trying to "dam up" heat within the oven, by use of massive heat retaining elements, the JKO9 oven is designed to permit a uniform loss and uniform replacement of heat. Heat is simply replaced as it is lost from the low mass, high conductivity shell. And within this shell the crystal unit remains wrapped in a blanket of warm air. Because sufficient heat is always lost by the shell none need be yielded by the crystal.



JKO9 Heat Exchange Pattern



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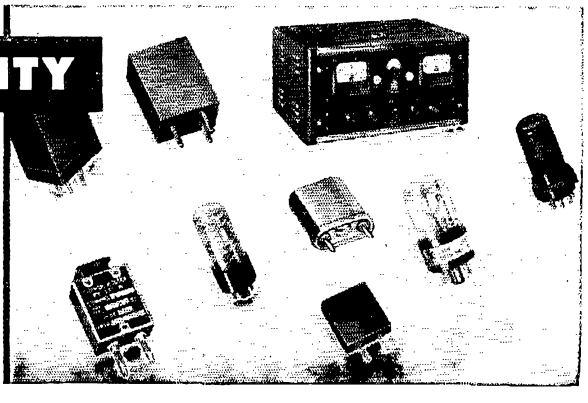

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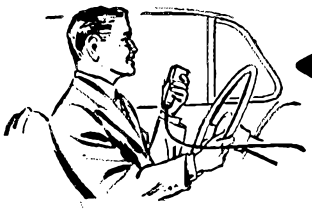

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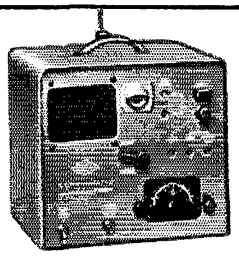
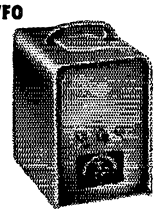


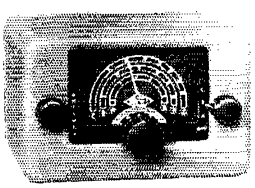
Model 3025 Communicator II

New, improved, complete 2-meter Amateur phone station in one portable case. Built-in adjustable squelch, headphone jack, dial light switch. **Transmitter:** AM phone; 5-7 watts output; for crystal or carbon mike; uses 8-mc crystals. RF Section: 6CL6, 12AV7, 2E26, 9006 tuning eye rect. and 6E5 tuning eye. **Receiver:** Tunes 144-148.3 mc. Cascode RF stage; 3-IF stages; noise limiter; PM speaker; 6BQ7, 6BQ7A, 12AT7, 2—6BH6, 6BJ6, 6T8, 12BF7. **Receiver Transmitter Tubes:** 12AX7, 6V6, 2—6X4 rect. With tubes and 19" whip; less mike and crystal. 10¼ x 9¼ x 7". For 115 v. 50-60 cycles AC or 6 v. DC. Shpg. wt., 24 lbs. **83 SX 820.** *Net*.....**$229.50**

Model 3024 2-Meter VFO



VFO for Communicator II at left. 24 mc output; plugs into crystal socket. Calibrated for 2 meters. Has audio preamp; increased gain permits using Communicator mike at arm's length. Spotting switch for zero-beating. Tubes: 6AH6, 6CL6, 6C4. Size: 10¼ x 8⅞ x 13⅛". For 115 v., 50-60 cycles AC. Shpg. wt., 10 lbs. **83 SX 819.** *Net*.....**$84.50**



Model 3002 Converter

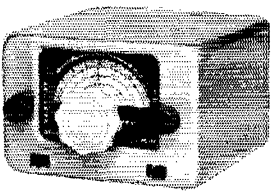
Provides continuous coverage from 3 to 30 mc. in three ranges. Each range is spread over nearly 360° to permit simple, accurate tuning. Range A: 3-8 mc; Range B: 8-18 mc; Range C: 18-30 mc. Has illuminated dial. Power requirements: 10 ma at 135 volts and 6 volts DC at 0.75 amp. 1500 kc output. Supplied complete with tubes, cables, and instructions. 5¼ x 3½ x 5¼". Shpg. wt., 5 lbs.

84 S 954. *Net*.....**$44.75**

Gonset DeLuxe FM Tuners

Same appearance as 3002 Converter above. Communications type tuners for home or mobile use. Squelch circuit. Easily connected to AM receiver. Require 14 ma, 150 v. DC; 1.8A, 6.3 v. Size: 5¼ x 3½ x 5¼". Shpg. wt., 5 lbs. *Less squelch.

83 S 822. 30-40 mc. *Net*.....**$69.50**
83 S 823. 40-50 mc. *Net*..... **69.50**
84 S 925. *88-108 mc. *Net*.... **59.50**
83 S 824. 152-162 mc. *Net*... **69.50**
83 S 825. 162-174 mc. *Net*... **69.50**



Model 3030 "Super-Six" Converter

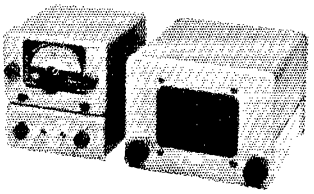
Mobile converter covering 75, 40, 20, 15, 11-10 meter Ham bands—as well as 19 and 49 meter bands (for world-wide short-wave broadcasts). Excellent signal-to-noise ratio. Panel controls: Antenna Trimmer, On-Off, Band Selector. Has RF Gain Control, Oscillator Compensator, and hi-lo impedance Antenna Switch on rear panel. The "Super-Six" may be used with any receiver covering 1430 kc. Supplied with tubes and cables. Housed in gray metal case, 5¼ x 3½ x 5¼". Power requirements: 80-135 volts DC at 10 ma and 6 volts at 1 amp. Shpg. wt., 5 lbs.

84 S 913. *Net*.....**$52.50**

3001 Clipper Noise Limiter

Effectively minimizes ignition noise, atmospheric static and other peak-type interference. Recommended for use with Gonset equipment in mobile installations, but will improve reception of any receiver. 2 x 4 x 1½". With 9006 tube and cables.

60 S 596. *Net*.....**$9.25**



Model 3041 "Super-ceiver"

IF- audio strip for use with Gonset "Super-Six" (illustrated above but not supplied), or other converter for highly selective receiver. Crystal-controlled HF oscillator, 4 double-tuned high-Q 265 kc IF transformers, BFO with pitch control, separate AF and RF gain controls, noise clipper, built-in speaker. Adjustable squelch. Built-in power supply; battery-saving circuit. Separate control head for dash, underseat or trunk mount. Main unit, 6¾ x 5¼ x 7"; control head, 2" h. With cables and connectors, tubes, speaker, crystal, power supply, mounting brackets. 6 volt operation. 8 lbs.

84 S 914. *Net*.....**$119.50**

3006 Steering Post Bracket

Mounting bracket for all Gonset converters and tuners. May also be adapted to mount any conventional mobile converter. Converter can be mounted on either side of steering post. With mounting straps and hardware. Shpg. wt., 1 lb.

84 S 994. *Net*.....**$3.90**

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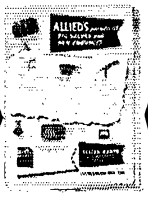

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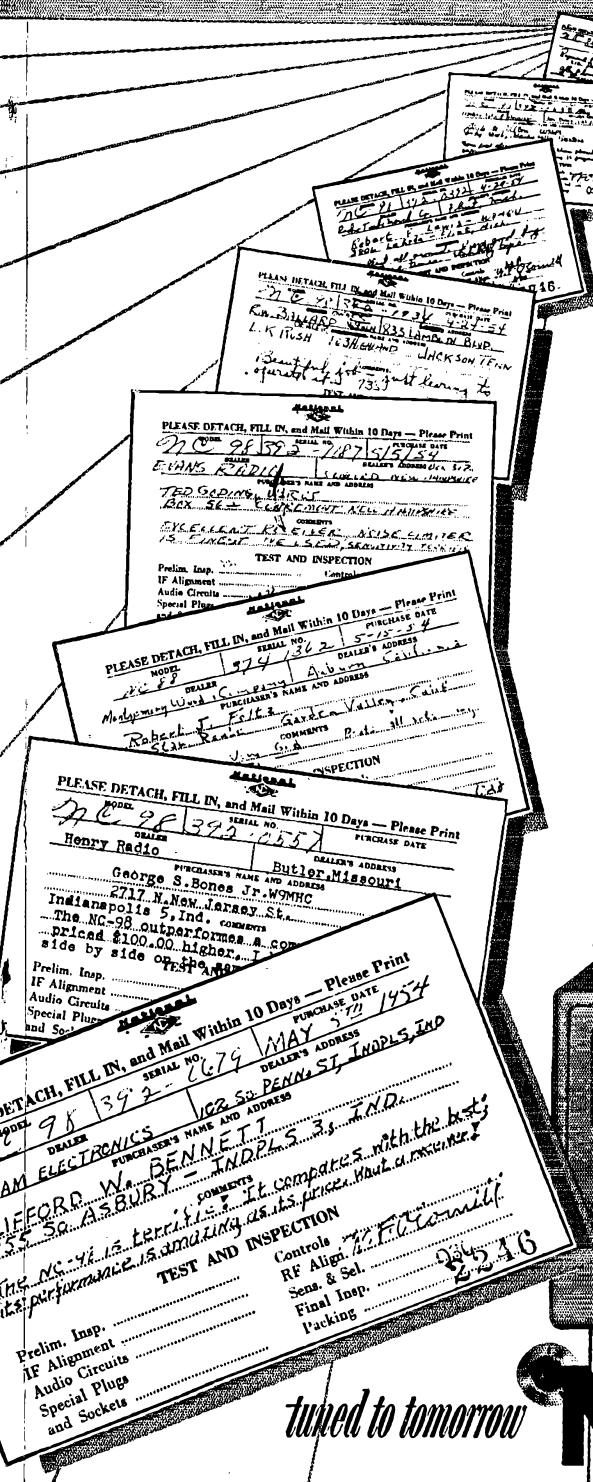


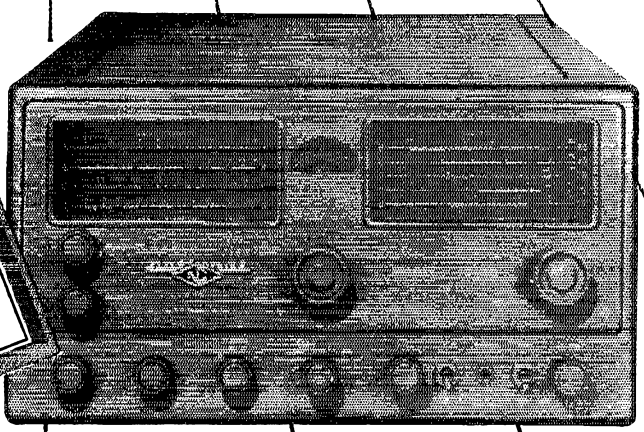
The real test of a receiver, is the test of use. As the old expression goes, "You've got to 'winter' it and 'summer' it" before you know how good it is. Part of the guarantee card shipped with each of our receivers is returned to us. On it is space for the owner's comments. As these cards pour in by the thousands, the enthusiastic comments we read never fail to give us a warm glow of pride.

Here is a small sampling of the cards we've received commenting on the NC-98. No wonder this superb receiver is blushing!

THE NEW NC-98

CRYSTAL FILTER · S-METER · 550 KCS. TO 40 MCS. RANGE · CALIBRATED AMATEUR BANDSPREAD OR CALIBRATED SWL BANDSPREAD (FOR SW LISTENING) · NEW MINIATURE TUBES · AN RF STAGE · ACCESSORY SOCKET · TWO I F STAGES · EDGE-LIGHTED LUCITE DIAL SCALES · NOISE LIMITER · SEPARATE HF OCS. .3- POSIT. SEL. · ANT. TRIM. · PHASING CONTROL · SENSITIVITY CONTROL.

Unmatched Value at $149.95



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NATIONAL COMPANY, INC., 61 Sherman St., Malden, Mass.

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for those who prefer triodes—

Known the world over for their conservative ratings, large reserve of emission, and high power output at reasonable plate voltages, RCA power triodes continue to remain the choice of the transmitter man who prefers triodes.

RCA has a modern line of power triodes to meet every power input requirement up to a "gallon"—'phone and CW. Check the figures on the charts below—and take your choice.

For R.F. Amplifier Service		Max. Amateur Ratings, Class C Telegraphy		
Type No.	DC Plate Input (Watts)	DC Plate Volts	Plate Dissip. (Watts)	Max. Freq.* (Mc)
RCA-810	750	2500	175	30
RCA-811-A	260	1500	65	30
RCA-812-A	260	1500	65	30
RCA-833-A	1000	3300	350	30
RCA-8000	750	2500	175	30
RCA-8005	300	1500	85	60

*for Max. Plate Input and Voltage

For Class B Modulator Service (2 tubes)			Typical Operation Values	
Type No.	DC Plate Volts	Max.-Sig. DC Plate Cur. (Ma)	DC Grid Bias Volts for Max. Rating	Max.-Sig. Power Output (Watts)
RCA-805	1250	400	0	300
RCA-810	2250	450	−60	725
RCA-811-A	1250	350	0	310
RCA-812-A	1500	310	−48	340
RCA-8000	2250	450	−130	725
RCA-8005	1500	330	−67.5	330

RCA Power Triodes—as well as ALL types of RCA tubes—are readily available through your neighborhood RCA Tube Distributor. For technical data, write RCA, Commercial Engineering, Section G37M, Harrison, New Jersey.

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