

QST

October, 1941

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35c in Canada

devoted entirely to

amateur radio

FEDERAL BUILDING

AMATEUR RADIO EXAMS
2nd FLOOR
9AM TODAY



GILPERSLEVE
WICAD



Briareus, Machinist?

With his hundred arms the mythical giant Briareus no doubt could have accomplished a great deal of work . . . say as a lathe operator. ¶There is no information, however, that Briareus was a brainy fellow and that he could skillfully employ any one of his hundred arms. ¶Here at Collins we believe that fine craftsmanship does not arise alone from good tools or keen workmen but is a result of the coordination of both. ¶Our factory, equipped with modern machine tools, utilizes nearly every process for the finished fabrication of

transmitter materials. Processing not satisfactorily procured from outside sources is done in our own plant; thus, we are able to control quality and to speed production. ¶Complementing our equipment is a large corps of highly skilled workmen who know how to use the tools to advantage. These men are instilled with the idea of doing the best possible job. They are inspired to have achieved the highest standard of craftsmanship.

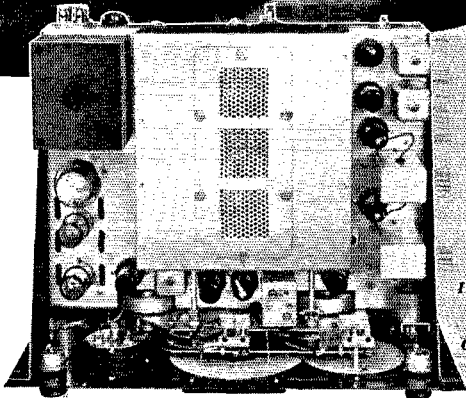
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CEDAR RAPIDS, IOWA NEW YORK, N. Y.: 11 WEST 42 ST.

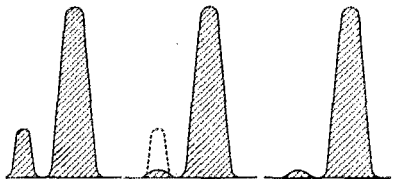
Precision Performance!



The New 1941 Super Skyrider Model SX-28 delivers precision performance! 15 tubes. 2 stages pre-selection. Calibrated bandspread inertia controlled. Micrometer scale tuning inertia controlled. Tone and AC on-off. Beat frequency oscillator. AF gain. RF gain. Crystal phasing. Adjustable noise limiter. Send-receive switch. AVC-BFO switch. Bass boost switch. Phono jack. 80/40/20/10 meter amateur bands calibrated. Wide angle "S" meter. Band pass audio filter. Improved signal to image and noise ratio. Push-pull high fidelity audio output. 6 step wide range variable selectivity. Improved headphone output. Super Skyrider, Model SX-28 with crystal and tubes, \$179.50.



Interior View
SX-28
Chassis



With selectivity switch in XTAL sharp position identify the weaker amplitude — Tune Receiver to the weaker.

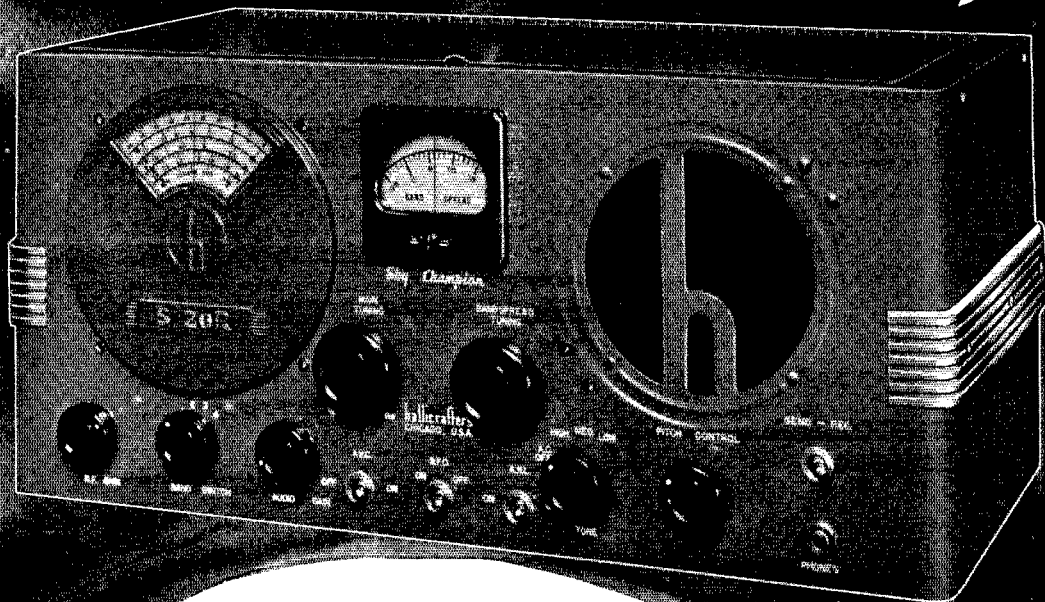
Adjust phasing control carefully until this weaker amplitude is reduced to a minimum.

Retune Receiver to the stronger amplitude and then adjust pitch control until you get note most pleasing to copy.

the hallicrafters co.
CHICAGO, U. S. A.

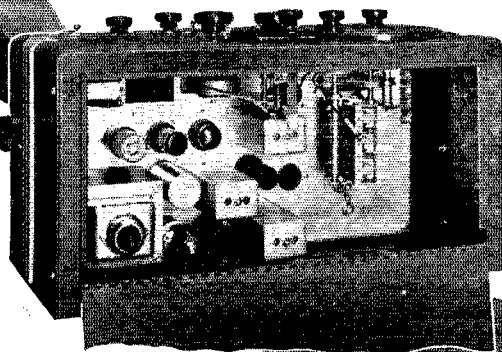
USED BY 33 GOVERNMENTS
SOLD IN 89 COUNTRIES

the 1941 Communications Value!



The Sky Champion represents one of the best values ever offered in the communications field—has all the essential controls for good amateur reception, 9 tubes, 4 bands, tunes from 545 kc. to 44 mc. Band one 545 kc. to 1720 kc. Band two 1760 mc. to 5.2 mc. Band three 5.3 mc. to 15.6 mc. Band four 15.3 mc. to 44 mc. Automatic noise limiter. AVC switch. Standby switch. Inertia bandspread tuning. Separate electrical bandspread. Beat frequency oscillator. Battery-Vibrapak, DC operation socket. Cabinet dimensions 18½" long, 8½" high, 9¾" deep. The Sky Champion (Model S-20R) \$54.50.

Tube line-up, 6SK7 RF amplifier, 6K8 first detector—mixer H.F. Oscillator, 6SK7 first IF amplifier, 6SK7 second IF amplifier, 6SQ7 second detector, AVC first stage of audio, 6F6G second audio output stage, 6H6 automatic noise limiter, 6J5CT beat frequency oscillator, 80 rectifier.



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OCTOBER 1941

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NUMBER 10



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QST

devoted entirely to

AMATEUR RADIO

PUBLISHED, MONTHLY, AS ITS OFFICIAL ORGAN, BY THE AMERICAN RADIO RELAY LEAGUE, INC., AT WEST HARTFORD, CONN., U. S. A.; OFFICIAL ORGAN OF THE INTERNATIONAL AMATEUR RADIO UNION



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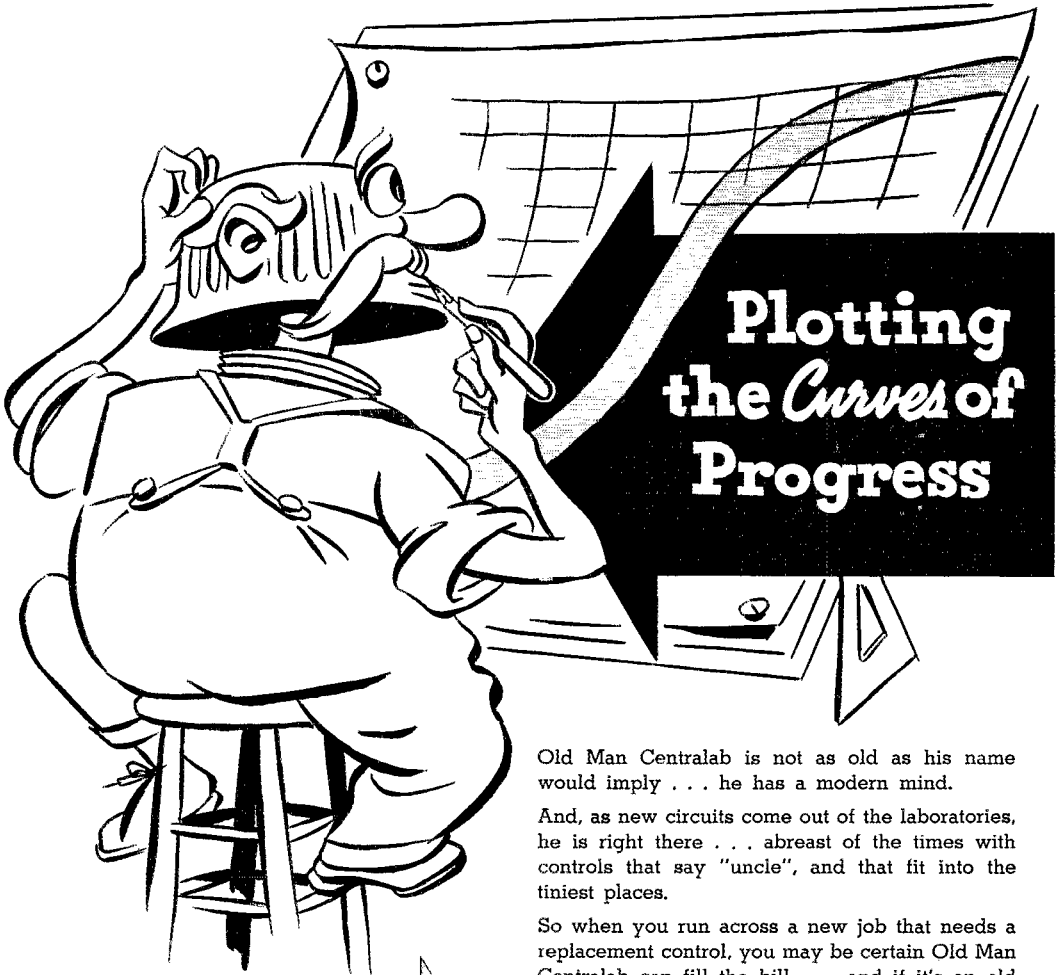
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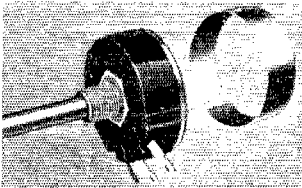
Old Man Centralab is not as old as his name would imply . . . he has a modern mind.

And, as new circuits come out of the laboratories, he is right there . . . abreast of the times with controls that say "uncle", and that fit into the finest places.

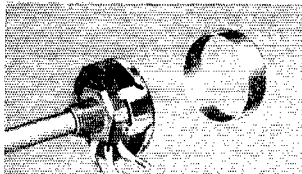
So when you run across a new job that needs a replacement control, you may be certain Old Man Centralab can fill the bill . . . and if it's an old "blooper" . . . there are any number of controls available that will make it "work like new". Old or new . . . there is invariably a CENTRALAB RADIOHM replacement that will do as well, or better than the original. "ALWAYS SPECIFY CENTRALAB".

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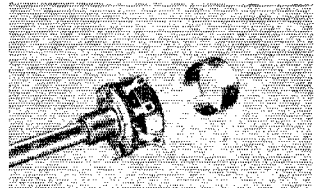
Centralab RADIOHMS



STANDARD: Wall type resistor hugs inner circumference of black moulded bakelite case. Exclusive non-rubbing contact band for quiet, smooth rotation and long life. 1 3/8" diameter x 9/16" deep. Available single, twin, or triple, plain or tapped with one or two taps . . . with S.P.S.T., D.P.S.T., or S.P.D.T. Metal shaft extends 3/8" from case



MIDGET: Companion to "Standard" . . . small size but large control efficiency. Available single, dual or triple . . . plain or one, two or three taps . . . with S.P.S.T., S.P.D.T., or D.P.S.T. Moulded bakelite case, 1/8" diameter, 1/4" metal shaft 3/8" long.



ELF: Small, but also features the long, straight resistor strip. Available plain or tapped with S.P.S.T. Switch . . . with or without dummy lug. Switch rated 2 Amps. 125 V. Underwriter's approved. Bakelite case 5/16" diameter, 17/32 deep (less switch) 25/32" deep with switch.

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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 non-commercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

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

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite. Correspondence should be addressed to the Secretary.



Past Presidents

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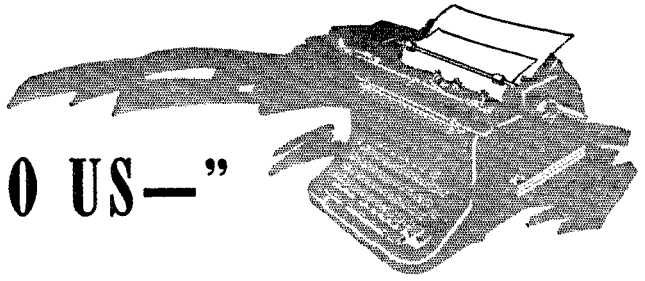
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Address all general correspondence to the administrative headquarters at West Hartford, Connecticut.

"IT SEEMS TO US—"



SHORTAGE OF MATERIALS

THERE seems no question that we shall shortly be in for a period of difficulty in obtaining some of the gear, components and raw materials to which we are accustomed. Some materials already are unobtainable, dealers' stocks of many parts are dwindling and many manufacturers report grave difficulty in securing the supplies from which they make apparatus for civilian use.

Without doubt this situation will be felt in amateur design and construction. For many years we have enjoyed the availability of a marvelous variety of components. It has been so good that we have practically stopped making our own parts. We buy them and assemble them into rigs. One amateur's transmitter differs from another's not so much in the components as in their physical layout and circuit arrangement. For a long while back, *QST*'s apparatus designs (putting the emphasis on use and performance) have deliberately employed only the "standard" parts that are widely distributed, with a minimum of special gadgets that require home craftsmanship.

It was not always so. Before the amateur market blossomed out with its beautiful profusion of parts, the experimenter perforce made most of his own. We may be in for a temporary return to this mode of life. Despite the annoyance, it will be an interesting and probably a profitable experience. American native ingenuity again will be at a premium and will be vastly stimulated. Refreshing new designs are certain to result, many of them worthy of quantity production when conditions return to normal. The five-and-ten will again be haunted by roving-eyed amateurs, looking for something that will give them an idea. Ingenious mountings of wood—not necessarily the old breadboards—are likely to come. It has been many years since we have seen a completely home-made transformer or a variable condenser fashioned out of tomato cans but if this situation goes from bad to worse we expect to see them again. There used to be a priceless ingenuity about the average amateur's station, each one an individual piece

of expression, and perhaps we shall be much the richer for a partial return to this much of the "good old daze."

QST has a goodly supply of standard parts and, by using them over and over, expects to continue its construction models as in the past. As time wears on, the individual amateur may find it impossible to get these parts or acceptable substitutes. Then we'll see the burgeoning forth of barn-door condensers and similar contraptions made of pie pans, rolling pins, baking-powder cans, hairpins and old bicycle pumps. Before that day is reached there is one large treasure-house to be explored, worthless to the commercial world but precious to us: the pile of junked broadcast receivers which every radio dealer has taken in trade and piled in his cellar. Here is a potential source of a lot of good equipment in the way of power supplies, variable and fixed condensers, etc., probably good for transmitters up to a couple hundred watts with proper handling. In the past they haven't been worth a dime a dozen and probably never will be worth anything except to the amateur on the prowl with that certain glint in his eye. Remember that source when parts get tough.

One thing most of us can't make is tubes. Many varieties are gradually disappearing. While we don't want to be like the women rushing the silk-stockings counter, it might not be a bad idea to be a wee bit forehanded and lay by a couple of the indispensable bottles that keep the rig on the air. The expectation is that there are tasks ahead that only our stations can do.

BUM SUPERHETS

EVERY so often we have sounded off in these pages about the appalling decline in the quality of American broadcast receivers, particularly as concerns their lack of protection against interference from other services. To show that we are not alone in this feeling, and that we're not tilting at mere windmills, we quote, with permission, an editorial appearing under the title "Recipe for a Black Eye" in a recent number of McGraw-Hill's preeminent trade publication, *Radio & Television Retailing*:

For several rounds radio manufacturers have been shadow-boxing with receiver design, whirling their arms in a manner impressive, yet so unscientific there is danger they may knock themselves out.

Already this has resulted in several self-administered black eyes. Sets now perform attractive extra functions, are easier to tune and styling apparently satisfies the mass market. *But few are as free from interference as the older sets they replace.* And this the public will eventually discover, even though broadcasters who have increased power, police and amateur stations still appear to be the "patsy."

Dealers and servicemen are already painfully conscious of this fact.

The trouble is not so much adjacent-channel interference as it is trick pickup of signals properly distant on the dial and really minding their own business.

To technicians familiar with superheterodynes, the chief cause of such weird performance is obviously omission of refinements, once considered essential and added to insure fool-proof reception shortly after this excellent circuit first made its appearance, only to be later removed. It is also obvious that the reason for the omission is purely price. And a very questionable method of slashing it seems because this circuit, so emasculated, can scarcely be considered modern at all.

The situation would be serious enough even if it applied only to the cheapest receivers, for customers might conceivably be convinced that they must expect some interference on such sets. *But it is not just the cheapest radios that "stick their chins out and ask for it."* Even in relatively expensive models invisible circuit refinements are too often sacrificed to visible sales

features in order to add merchandising flash and still hold the list down.

Manufacturers who continue to brush aside complaints about interference with the excuse that trouble occurs in too few locations to warrant consideration when designing models for national distribution are "leaving their guard open."

Our own contacts with the trade indicate that complaints are widespread rather than isolated and growing dissatisfaction in the field concerning receiver selectivity is extremely dangerous for the future of this business, which must depend to such a large extent upon replacement sales.

Greater freedom from interference must be included in new radios.

If it isn't, there will soon be a run on raw beefsteak among the shadow-boxers.

This is what the distributors and dealers think. That it is justified, any one can prove to himself by dropping into the nearest radio store and inspecting the "modern" sets: huge cabinets, enormous dials, giant speakers—and a measly little tuning system with a two-gang condenser, and no shielding worthy of the name. Or, worse, it's a dink with a loop that acts as an unshielded "r.f." stage. It's almost like a treasure hunt to find a set with preselection—unless it's an automobile set! While we excuse no amateur for avoidable QRM to his listener neighbors, the article above may be useful ammunition in hopeless cases where a receiver is fondly believed to be of modern design because it was bought in 1940 or 1941.

K. B. W.

Midwest Division Convention

Kansas City, Mo., October 11th-12th

THE 1941 Midwest Division Convention will be held in Kansas City, Mo., October 11th and 12th, at the Hotel Muehlebach under the auspices of the Heart of America Radio Club.

General Chairman Heyde, W9SSG, promises a bang-up convention. A program of interesting speakers and demonstrations is being arranged. There also will be round tables for AARS, NCR, YLRL, u.h.f., etc., with a Wouff-Hong initiation Saturday midnight. An excellent banquet has been arranged for Sunday afternoon at which Tom Collins, newspaperman and famous after-dinner speaker, will bowl you over with laughter. Come and hear Tom—you'll like him. And bring the ladies for an interesting program being arranged for them.

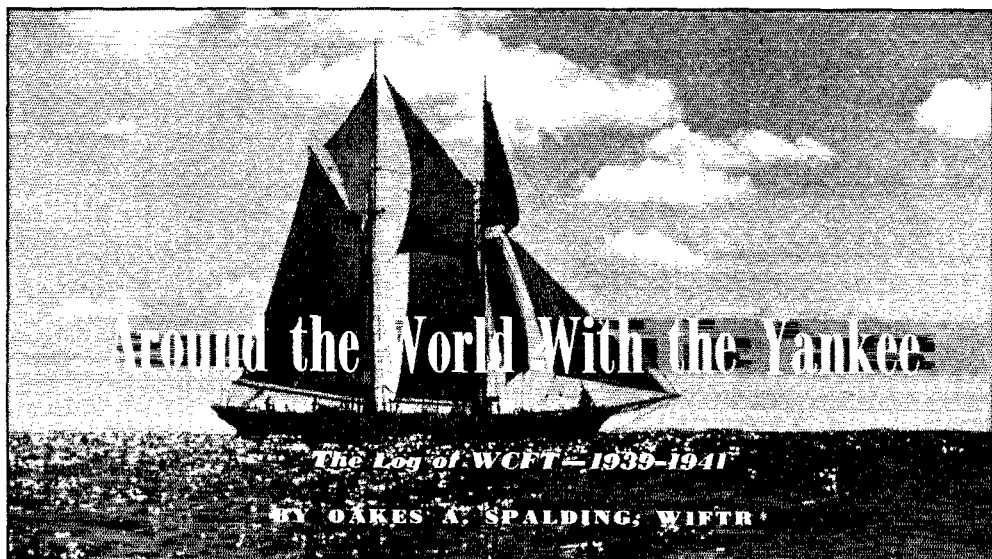
All this for only \$2.50! Make registrations and reservations early. For further information communicate with the Heart of America Radio Club, Box 7092, Kansas City, Mo.

New England Division Convention

Boston, Mass., October 18th

THE New England Division Convention, and 8th annual Boston hamfest, sponsored by the Eastern Massachusetts Amateur Radio Association and the South Shore Amateur Radio Club, will be held at the Hotel Bradford, Boston, on October 18th. An exhibit of emergency equipment will be held and all amateurs are invited to submit entries; prizes will be awarded. Meetings for ORS, OPS, AARS, AEC, u.h.f., and other groups will be held and several technical talks will be given. There will be a 2½-meter hidden transmitter hunt in the morning.

Registration fee will be \$1.00 and the banquet \$2.00, or a combined ticket for \$2.50; the banquet will be limited to 400, so get your reservations in early. Write to Convention Chairman H. A. Gardner, W1EHT, 25 Hillside Ave., Stoneham, Mass.



Photos courtesy Raymond Dillon

Now that I look back on that eventful cruise aboard the schooner *Yankee* I don't know which gives me the biggest thrill — the fact that I visited in person all those romantic spots you read about in the travel books, or that I was probably the only ham in the world making DX QSOs with Ws for nine long months or more.

Not that it was planned that way, of course. The European situation looked pretty bad, it is true, when we left the dock at Gloucester in the fall of '39 for an eighteen-month cruise around the world, but American hams were still free to work any other country as long as strict neutrality was observed. It wasn't until the following June that U. S. stations were forbidden to make foreign contacts.

That was when the FCC issued Order No. 72. You may remember it. I do, for in banning contacts with foreign amateur stations it also outlawed contacts with ships at sea.

Since we depended to a great extent on our amateur schedules, this was a serious blow. Fortunately, the ARRL was able to get the FCC to adopt an amendment to the order designating certain stations which could continue to work us.

Probably every amateur has a general idea of the nature of the cruise aboard the *Yankee*, either from hearing contacts over the air or through reading Alan Eurich's accounts of the previous voyage in *QST*.

The *Yankee* is an old Dutch pilot boat used in the North Sea until about 1925, when she was acquired by an Englishman for a yacht. Captain Irving Johnson bought the boat in 1932 with the idea of making trips around the world in it. For

* 307 Highland St., Milton, Mass.

this the *Yankee* was ideally suited, being heavily constructed and a remarkably good sea boat. She is 92 feet long over all and 76 feet on the waterline, and carries in addition to her regular schooner rig an 82-hp. diesel engine which furnishes power for getting into port and for charging the storage batteries. No radio transmitter was carried on the first cruise made by Captain Johnson, but on the second trip a small transmitter was built and installed by Alan Eurich, W7HFZ, who went along as operator.

When the opportunity to go on the third cruise presented itself I took advantage of it, and on October 27, 1939, we set sail from Gloucester. The party consisted of Captain Johnson, his wife, his two small sons, Miss Nora Bailey of Toronto, Dr. Raymond Dillon of Boston (W3DWJ/1) who was the medical officer as well as photographer, myself as radio operator, Fritz, the paid cook, and a group of young men of around college age who were taking the trip to see the world.

The route we followed went about as follows: From Gloucester we sailed down through the Panama Canal, and then across the South Pacific, visiting as many islands as possible. We visited the Solomon Islands and New Guinea and the Dutch East Indies and Singapore. From Singapore we cruised around the north end of Sumatra, across the Indian Ocean to Zanzibar, and then south around the Cape of Good Hope to Capetown. On the way home we crossed the South Atlantic to Brazil, and then sailed up the coast to New Guinea, through the West Indies to Bermuda, and so home.

I'd like to tell you about some of the hams I met and the experiences we encountered along



Andrew Young, operator at Pitcairn Island of the famous VR6AY.

that route. Suppose we sit down and look over that tattered WCFT log. . . .

After a stormy trip down the Atlantic — in itself quite an experience for a green crew — we finally reached Panama. Although we could not avoid a tropical hurricane that seemed to be aimed directly at us, we were able to prepare for it and get on the favorable side of the storm center. On the way down, NAA's weather was copied daily and its value to sailing ships was thoroughly appreciated.

In Panama, Major R. D. Prescott of HP1A fame — hero of many a DX contest and the only licensed amateur in the Republic of Panama — was of great help. We found him to be a solid citizen of middle age, a resident of Panama most of his life and now the head of radio activity in that country. On the trip down to Panama we had trouble with the 'phone cords absorbing moisture, and it was necessary to bake them in the oven before going on the air. HP1A obtained a set of rubber-covered cords for us and cured the trouble completely.

K5AA, K5AF and K5AG were visited, and some of the preparations designed to make Panama invincible were seen, although at that time the defense program had not really started. Lt.-Comdr. Tucker of the naval communications unit came aboard for a visit and his suggestions as to guarding against moisture (principally the burning of a 10-watt bulb in the receiver at all times) were most valuable.

From Panama we sailed for Ecuador, where the *Yankee* was left on the coast at Salinas while the crew went overland to Guayaquil. 'Phone men will associate HC2HP with that city, and a visit was made to the station. Unfortunately, Dr. Parker, the owner, was away at the time, but his son, also an amateur, showed us the rig.

The Galapagos Islands were the next port of call. Here on San Cristobal there is a government station, HCW, whose operator, several years ago, gave American hams an Ecuadorian contact while operating under the call HCAC in Quito.

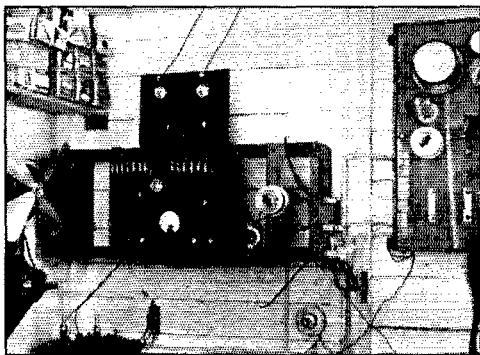
While in the Galapagos Islands we saw several commercial tuna fishermen from San Diego and spent an exciting morning on one of them, the *Belle of Portugal*. She was one of the larger fishermen and could carry 300 ton of tuna. Radio was used on these boats to keep in touch with home and report the location of fish and bait.

While at Panama, we had been asked to take along eight bags of mail and other supplies for Pitcairn Island. In the shipment was VR6AY's transmitter, which had been sent for repair to Panama by Andrew Young. It was finally landed from the *Yankee* after an exciting trip through the surf at Bounty Bay. Unfortunately, by that time, all operation by British amateurs was prohibited, so many interesting DX contacts were missed.

When we arrived at Pitcairn we found that the New Zealand Government had sent over an amateur (Nelson Dyert, ZL2FR, who had married a girl from Pitcairn) to establish a government station. Consequently, although no amateur work could be done, VR6AY was still on the air working schedules with Wellington on government frequencies. ZL2FR had brought over his own ham rig and was running about 200 watts. Power was obtained from a 1-kw. Kohler generator.

The ocean was so clear at Pitcairn that we could see the anchor, 120 feet below. We could even see the remains of the *Bounty* — the imprint of the keel, and some of the timbers — in the crystal depths. Radio conditions in the vicinity of Pitcairn were remarkable. From about 5 p.m. the broadcast stations from the U. S. East Coast began roaring through and WEAJ, WJZ, WOR, WLW and the other higher-powered stations came in like locals. All other frequencies were correspondingly good — a genuine paradise for a DX hound.

We stopped for a week at Pitcairn. I was the guest of Andrew Young and his family in their comfortable wooden frame house. They could not have been more cordial; I enjoyed my visit tremendously. Andrew has sent out over 4000



Radio station at Tarawa in the Gilbert and Ellice Islands. A single '45 was used for communication with the other islands.

QSL cards, perhaps half of which represented contacts.

Honolulu was the next port where there was amateur activity. Two days before we reached Honolulu I had contacted John W. Hopkins, K6PLX, who notified the authorities of the time of our arrival and met us at the dock. He and J. F. Bingham, K6PKJ, had handled traffic to Schofield Barracks for us from one of the boys on the boat whose father was in the regular army, and also handled some of our messages to W1AW while we were in Honolulu. Frank Bishop, K6PAS, very kindly arranged a 10-meter 'phone contact with W1AW and I was able to talk to my wife in Hartford.

Visits were made to the Pan-American radio stations on the north side of the island and the Globe Wireless station, KHK. I found radio a vitally important factor in life in Hawaii. Due to the war and the great increase in air travel there is a great deal of activity in all branches of radio, and the newest and latest equipment could be seen everywhere. In fact, I saw some apparatus there more modern than anything I had ever seen in the States.

On our way to American Samoa, we stopped off a couple of days at Canton Island. This is the first stop of the Pan-Am Clippers on the run to New Zealand. Regular flights were to be started in the near future, and there was much activity preparing for the service. In addition, Canton Island has become an important outpost for the defenses of Honolulu and several flights of Navy planes had visited the air base. Pan-Am maintains a well-equipped radio station for the use of the Clippers, as Canton Island is small and highly accurate direction-finding systems must be used. The U. S. Department of Commerce maintains a weather reporting station there, as well. The operators of the U. S. weather station were active on the amateur bands under the call KF6JEG. Schedules were maintained with Henry Lee and Jim Stein for a time after the *Yankee* left Canton.

One of the more dramatic episodes of the trip occurred while we were en route to Samoa. Mrs. William J. Donovan (wife of Col. "Wild Bill" Donovan, President Roosevelt's special European emissary) had joined the party at Panama. One night at sea I received a radiogram from her husband via W1AW stating that her daughter had been killed in an automobile accident. Immediately we began to check eastward sailings; the *Mariposa* was due to leave Samoa in 10 days. That meant a wait, so Mrs. Donovan filed a reply asking that arrangements be made for her to stay at the Governor's mansion on the island. I passed the message on to KF6JEG, who relayed to W2IXY. Confirmation came back the next night. When we reached Samoa I stopped by for a ragchew with the operator. He asked, "Just who have you got aboard that tub of yours, any-



Native boys in the Solomon Islands. These boys brought out a highly inlaid canoe which was purchased for the Mariners Museum at Newport News, Va.

way?" It seemed his traffic for the past day or so had consisted of nothing but messages from the Secretary of State, the Secretary of the Navy and other high officials ordering the Governor to invite Mrs. Donovan to stay with him.

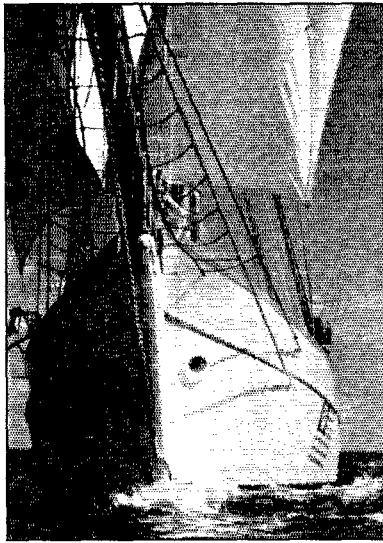
It turned out that none of this was a surprise to the Governor. It seems he had an all-wave set and knew the code, and had picked up the original message!

We reached Samoa in April, 1940. During our stay their Declaration of Dependence Day was celebrated. It was the 40th anniversary of U. S. acquisition of the islands. A big celebration was held, and native tribes came in from the surrounding villages and performed ceremonial dances in competition for prizes.

American Samoa is directly under Navy control and amateur radio has always been frowned on by the officials there. KH6SHS and KH6DME were in the naval radio station, however, and hoped to be able to get on the air soon. Jerry Petranek, KH6SHS, did manage to get on after we left and gave a few lucky U. S. hams a contact with Samoa. His station was located at Pago Pago, a beautiful landlocked harbor surrounded with high hills which made it difficult to get a signal out.

Back in Honolulu we had been approached by the Amelia Earhart Foundation, who asked us to go through the Gilbert and Ellice Islands to see if there were any traces of her plane. Needless to say we found no such traces, but the side trip

gave us an opportunity to see some of the typical South Sea islands. A schedule with K6FVL was arranged before we left Honolulu, and we were able to report regularly to the Foundation through him. These islands are off the beaten track and very few traders visit them now, due to the lack of shipping and the poor market for copra, their only commercial product. The British Government maintains radio communication between the different islands, mostly with small battery-operated portable 'phone transmitters. At one island, Vitupu, they used a couple of '01A's using a test-tube "B" battery supply which had to be charged every day by a couple of native boys pedaling a bicycle generator.



Rolling along in the trade winds with the squaresail.

When we arrived at Ocean Island, the official who came aboard to seal the transmitter was none other than A. B. Dickes, VR4AD, who had been shifted from Tulagi in the Solomon Islands. I had worked him from my home station and we spent an evening talking over ham radio and old times. He was only waiting for the war to end so that he could get back on the air again. VR4AD felt very strongly about the war, for it had thwarted him in fulfilling his life's ambition: to be the British Empire station to work the most American hams during a year. He had figured out an exacting timetable for accomplishing this feat—6½ minutes per contact, so many contacts a day, etc. This program had been interrupted by the war, and he was anxious to get back at a key again.

About this time we began to experience difficulty in pulling signals through on 40 meters from the United States, not because the W stations were weak but because the band was full

of signals from Japanese, Chinese and other government stations. These signals would wander up and down the band. It is no wonder that more 40-meter U. S. signals are not reported from the Far East.

At Tulagi, in the British Solomon Islands, we met Bruce Chapman, who with Dickes, VR4AD, has put the Solomon Islands on many a DX ham's map.

Port Moresby, the chief port of New Guinea, was a communication center for the district. There were radio direction finders there and equipment for the air-mail service to the gold fields in the interior and to Australia. At the commercial station we found Warner, Searle, Hodges and several other VK amateurs. They entertained us royally. Here, as in the South Seas, radio is of prime importance.

In all parts of the British Empire we found that the amateurs had formed the first line of defense in communications. With the tremendous expansion necessary to maintain wartime communication, the hams had cheerfully contributed their services and equipment. It was another striking indication of the solidarity of the British Empire.

When we reached Batavia in Java after a wonderful trip through the Dutch East Indies—including a stay at Bali which was even better than we had expected!—we found that the NIVIRA was still very active and that the amateurs are highly regarded by the Dutch Government. Meetings were being held almost every week. Listening posts had been established all around the coast of Java to warn in case of invasion, and the amateurs were being called upon to take up this work. Amateurs were



Tuna fishing on the commercial tuna fisherman *Belle of Portugal* from San Diego. The Galapagos Islands are one of the best fishing grounds in the world.

important, too, in the communications department of KNILM — the Dutch Airline Company.

I had a very nice visit with Th. Leyzers, PK1CF, the president of the NIVIRA. Like practically all of the amateurs we met, he spoke excellent English, and he told me what the amateurs were doing in the war. He felt, too, that amateur radio had demonstrated its usefulness and that they would be allowed to operate again after the war.

The following morning I visited Mr. Van Swieten, PKIKE, the treasurer of the society. He gave me some idea of the difficulties in sending money out of the country due to exchange regulations. At first they had been unable to purchase any American parts, but finally they persuaded the government that American parts and sets were necessary and the regulations were relaxed.

In Singapore I looked in vain for any of the old amateurs that had been licensed before the war. All were in either army or navy service and I could not get in touch with them. However, VS3AE, the son of the Sultan of Johore, paid a visit to the boat, flanked by camera and secretary. He is a genuine ham — has probably the world's biggest QSL card. Later we saw his private zoo, where he has a gorilla almost as large as Gargantua and other animals.

From Singapore we sailed around the north end of Sumatra and down the west coast to Padang, which was our jumping-off port for the trip across the Indian Ocean. There we met H. Decker, PK4DR, and E. M. Z. Steenbakker, PK4ES. Demonstrating the camaraderie that exists among hams everywhere, they kindly donated a neon bulb and a 42 tube. On the boat (as at home!) the mortality of neon bulbs was very high. The trip across the Indian Ocean took thirty days, during which time we had every kind of weather from dead calm around the Equator to a heavy following trade wind which pushed the *Yankee* along to break her previous record for a day's run. It was during this trip that I heard AC4GP calling "CQ — QSL through AC4YN" several times, and I have often wondered if his signal was heard in the U. S. He had a very good signal and should have been heard in the U. S.

When we reached Zanzibar we found the city under a total blackout at night. The Italian Somaliland border was less than 300 miles away and, although there had been no enemy activity, the officials were taking no



James Norman Hall, author of "Mutiny on the Bounty" and Captain Johnson on the deck of the *Yankee* at Tahiti.

chances. Mr. Trinidad, VP1PZ, the only amateur on the island, is one of the officials in charge of the radio station. The town of Zanzibar is Arabic in character, and it was quite an adventure finding one's way around the narrow streets during the blackout.

We put into Dar Es Salaam, Tanganyika, on the mainland of South Africa, to have repairs made to our rudder, which had been damaged in a storm on the Indian Ocean. This is in the territory acquired from Germany after the last war.

At the time there was a rest camp for the South African Air Force just outside of the town, and we met many of the officers and men. They are a fine group of men and couldn't have been more hospitable. Here, also, was a training camp for the King's African Rifles, native troops officered by South Africans. Their discipline and morale was exceptional. We found H. J. Powell, VQ3HJP, in charge of the radio service for the airlines and the telegraph company. Once again I was made quite homesick looking over the hundreds of QSL cards from the U. S.

Powell showed me some of the British Marconi equipment that was used at the



Turks Island in the Bahamas. Salt obtained from evaporating sea water in the background. The author wasn't arrested for speeding.



A 300-pound sea turtle caught in the Galapagos Islands. Turtle steak tastes like the best beef tenderloin. We carried five of these large turtles alive on the fore deck for a fresh meat supply.

station. They go in for very massive construction with a maximum of tubes, and are very partial to relays. Amateur design would accomplish the same or better results with half the tubes and space and with a corresponding decrease in the chances of failure in the component parts.

Cape town certainly lived up to its reputation for hospitality. Although it seemed that every amateur in South Africa was on active service with the forces, I did meet a few of them. Among them was C. A. W. Rieder, ZS1T, who does much of the radio servicing on ships that enter Cape town. He had been doing a lot of listening on frequencies around 30 Mc. and above, and said that the signals from U. S. police transmitters were coming through consistently. Here also I met Warren Eckweiler, ex-W2CCZ, who entertained several of us one evening at his home.

We were almost fired upon by the shore battery due to a mix-up in blinker signals when we arrived at St. Helena early one morning during a heavy mist. We entered the harbor at dawn. The skipper could see the harbor blinker batting away through the fog and called me up to see what was doing. The harbor station was sending "K." If we had been receiving our entering instructions by radio this would have meant "come ahead," of course, so I sent back "R" and we sailed on in. They sent "K" again, and we repeated the exchange a couple of times. Finally they asked what boat we were. I replied, "Yan-

kee," and we were told to come on in and anchor.

Later I was told by the port commander that they had a shell in the gun and the gunner was asking, "Shall I let him have it?" when we didn't heave to on the signal "K." You see, "K" in the flag code (ordinarily never used with blinker signals) means, "Heave to immediately!"

Arriving back on American shores at Georgetown, British Guiana, I looked up J. LaMotte Kerr, VP3BG, whose amateur station has been turned into the official broadcasting station. The transmitter operates in the 48-meter band under the call of ZKY. VP3BG is also in charge of a network of 'phone stations located on the various plantations, giving complete coverage of the whole country. They turned to radio when the natives persisted in the embarrassing habit of chopping down telegraph lines as often as they were erected.

Antigua in the Windward Islands was our next port of call. There I found that VP2AT's station had similarly been made the official broadcasting station for the island. DeSilva is in the customs department and it was he who came aboard and sealed our equipment when we put into the harbor.

Through the cooperation of the ARRL, daily schedules had been arranged with W1AW. The outstanding signal of W1AW all around the world and the patience and operating ability of Hal Bubb and George Hart in copying our signal through the heavy QRM on the 36-meter ship band enabled us to maintain these daily schedules. Night after night W1AW copied our signal through QRM that would have driven the average operator crazy. On our end the problem was relatively simple, as W1AW's signal was always perfectly readable. Amateurs who think our bands are crowded with poor signals should try to copy through the signals found on 36 meters!

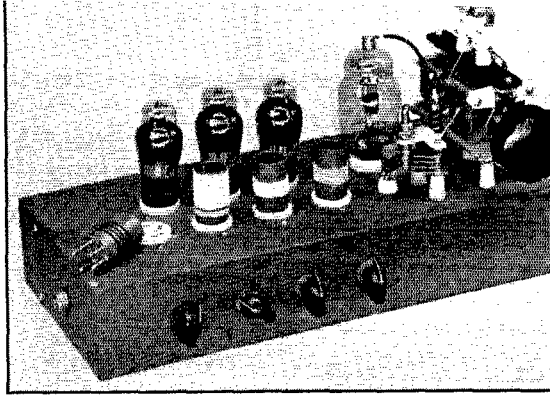
When we reached the vicinity of the Solomon Islands, Carl Anderson, W6CDA, took up the burden of the schedules. W6FT's signal was becoming unreliable on the East Coast, although W1AW was still pounding through. Carl's cooperation was greatly appreciated and he was always ready to keep schedules at the time most convenient for us.

To facilitate traffic, Carl arranged a relay schedule with KA1AK in Manila which carried us half way across the Indian Ocean, when we began to pick up signals consistently from the East Coast again and schedules were resumed direct with W1AW.

Two members of the crew were from Cincinnati, and schedules had also been arranged with W8JRM. Although troubled by power leaks and QRM, he was able to maintain very consistent communication. A surprisingly good S7 signal was received from him on 40 meters the day before we arrived in Singapore.

(Continued on page 108)

The 80-watt transmitter uses a string of 6AC5G's to excite an HY30Z on any band. The coils shown are for 14-Mc. operation with an 80-meter oscillator — the 28-Mc. coil is not used and is resting on top of the chassis. Excitation from the oscillator is brought in at the terminal on the left. An aluminum strip on the final tank condenser has been replaced by a bakelite strip on which the coil socket is mounted.



An 80-Watt All-Band Transmitter or Exciter

A Design for Convenient Band Changing

BY BYRON GOODMAN,* WIJPE

FOR a number of years an increasing proportion of the amateurs have been using variable-frequency crystals or oscillators to move from under QRM or (bless their little hearts!) to set their frequency to that of someone else. This practice has modified station design to the extent that the frequency-control device (crystal-switching, e.c.o., etc.) is usually located right at the operating position, while the transmitter proper may be across the room or at least located where it would be inconvenient to mount the frequency-control unit and still have it accessible without leaving the operating position. Many overcome this difficulty by placing their transmitters alongside the operating position, but just as many find this inconvenient or not in keeping with their aesthetic tastes.

There is room for argument as to whether the frequency control should be capable of output on more than one band or whether all of the frequency multiplying to get to other bands should be done in the transmitter proper. Many may prefer the former, but our personal preference is for a v.f.o. that works over the lowest frequency band to be used, leaving to the transmitter the job of doubling and getting to the other bands. One reason for the single-band v.f.o. is that the keying characteristic can be adjusted and left alone and, unless the following stages modify it, the keying should then be the same on all bands. Also, the construction and calibration of the v.f.o. is simplified if the unit is built for one-band output.

The rig to be described is designed to utilize the output of a self-excited or crystal oscillator delivering about 5 watts at 80 meters, although it can easily be modified to work from a 160-meter frequency-control source if desired. The output

tube is an HY30Z, a tube that delivers from 45 to 50 watts on all bands from 160 to 10 meters. Operating on the fundamental frequency of the oscillator the HY30Z is driven directly, and an additional 6AC5G doubler tube is cut in automatically as successively higher-frequency bands are used. The 6AC5G is a modern version of the 46, and it is an excellent tube for use as a low-power doubler. Because of its high μ , a small amount of cathode bias will keep the idling plate current to a low value without the need for external bias. The HY30Z is also a high- μ tube, and 6 volts of dry-cell battery bias will limit the idling current to about 10 ma. Operating the tubes in this manner at less than cut-off bias tends to preserve the keying characteristic¹ and doesn't complicate the power supply by requiring a bias pack.

Reference to the wiring diagram in Fig. 1 will show how the automatic switching operates. The 80-meter output of the external oscillator is connected to the "input" terminal. If 80-meter operation of the HY30Z is desired, the input coil is plugged in socket S_1 and the circuit tuned to resonance by C_1 . This puts 80-meter drive on the

¹ Goodman, "Some Thoughts on Keying," *QST*, April, 1941.

Here is a small transmitter or exciter designed for the amateur who likes to take a shot at all of the bands without too much trouble. It is complete except for plate supply and an 80- or 160-meter keyed oscillator, and it can be used for break-in operation on all bands without complicated bias supplies and any noticeable modification of the keying characteristic.

* Assistant Technical Editor, *QST*.

grid of the HY30Z and automatically leaves the plate voltage off of the 6AC5G doublers. If 40-meter operation is desired, the input coil is plugged in socket S_3 and the 40-meter coil is plugged in socket S_4 . The jumper in L_3 puts plate voltage on the 6AC5G and its grid and plate circuits are tuned to 80 and 40 meters by C_3 and C_4 respectively. The same principle applies to operation on 20 and 10 meters — on 10 meters the input coil is plugged in S_1 , the 40-meter coil in S_2 , the 20-meter coil in S_3 and the 10-meter coil in S_4 . Fairly uniform excitation is applied to the HY30Z on all bands, although it does drop off slightly on the higher frequencies. Another advantage of this system is that the grid lead to the HY30Z is short, not so in some switching systems. The one drawback of the line-up is that there isn't enough drive on 28 Mc. to double successfully to 56 Mc. in the HY30Z.

One might wonder why beam-power tubes like the 6V6 weren't used instead of the 6AC5G's. If they were, the switching problem would be complicated because of the need for removing screen as well as plate voltage, the tubes would all be overdriven, and some fixed bias would be required. It might also appear attractive to use a high-powered beam tube in the final, such as the 813 or HK257, but unfortunately it is impossible to get a good match from the plate of the 6AC5G to the grid of a final tube of this type without tapping down the 6AC5G plate on the coil. This can be done in this circuit but the 6AC5G's are then overdriven, with consequent grid emission and plate current drift. The transmitter was first designed along these lines but had to be modified to the present line-up because of the objections just mentioned. This works out to be a more practical set-up anyway, since the triode requires no large bias supplies or heavy voltage dividers as does the beam tube or pentode. The HY30Z works in well because its high μ makes it require practically no fixed bias, and the output of a 6AC5G doubler running with 300 volts on the plate gives a nice margin over the rated drive on all but the 28-Mc. band. Doubtless other and slightly higher-powered tubes could be used in

the final, but the excitation would be somewhat under the nominal value.

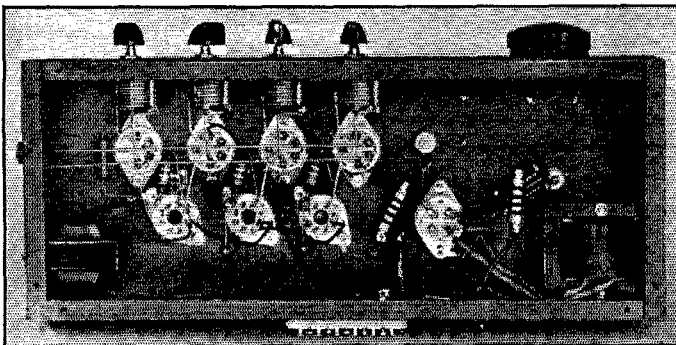
Construction

The transmitter circuit lends itself readily to straightforward construction and a reasonable amount of symmetry in the layout. It is built on a 3- by 7- by 17-inch metal chassis, as can be seen from the photographs. The small doubler tuning condensers are mounted under the chassis on the front. Single-hole mountings are used, and the condensers are insulated from the metal by fiber washers. The final tank condenser is mounted on small Isolantite stand-off insulators, since the rotor has the full plate voltage on it. The HY30Z tube socket is sunk below the chassis to bring its plate closer to the stator connection on the tank condenser.

The final tank condenser was modified slightly by removing the aluminum cross piece that mounts the rotor brush and substituting a strip of bakelite. The final tank coil socket is mounted on the bakelite strip, and the rotor brush is fastened to the chassis under the condenser on a small Isolantite through bushing. This makes a convenient lead from the rotor to the under side of the chassis and allows the plate by-pass condenser, C_{13} , to be mounted underneath the chassis. The neutralizing condenser, C_N , is mounted above the chassis on the small insulators furnished with it, and the lead from it to the grid is run through a small insulating bushing.

The filament transformers are mounted under the chassis at convenient points. A single 6-ampere transformer could be used instead of the two that are shown — two are used in this rig because transformers of different voltages were necessary for some of the other tubes that were tried. If a single transformer were used, one side of the 6AC5G heaters would not be grounded, of course.

The power terminals are brought out at the rear of the chassis to a Millen 37015 terminal strip and a 37001 safety terminal. The excitation input terminal is mounted on the side of the chassis and is an Amphenol PC1M unit.



The small tuning condensers and the filament transformers can be seen in a view underneath the chassis. The HY30Z socket has been lowered by mounting it on long screws. The lead from the rotor of the final tank condenser is brought down through an insulated bushing on which the rotor brush has been mounted, and the grid lead from the neutralizing condenser is also brought through a bushing. The 6AC5G plate blocking condensers are hidden by the tuning condensers.

Tuning the Transmitter

Tuning will be greatly simplified if meters can be left in the various circuits. A 0-150 or higher milliammeter should be used in the plate lead to the HY30Z, a 0-100 or higher milliammeter can be used in the 300-volt line to the 6AC5G's, and a 0-50 or higher milliammeter can be used in the HY30Z grid circuit from the 6-volt bias battery to ground.

For 80-meter operation, L_2 is plugged in S_4 and the 80-meter coil is plugged in the output tank circuit. The grid circuit is tuned and, if the frequency-control unit is delivering enough power, from 25 to 50 ma. grid current to the HY30Z should be obtained with no voltage on the plate of the HY30Z. The neutralizing condenser, C_N , is then adjusted until there is no flicker in the grid current as C_5 is tuned through resonance. Plate voltage can now be applied to the HY30Z and the stage loaded to 90 or 100 ma. The grid current will drop down to the normal value of 20 to 30 ma.

For 40-meter operation, L_2 is plugged in S_3 , the 40-meter L_3 is plugged in S_4 , and the 40-meter tank coil is plugged in the HY30Z plate circuit. Tuning C_3 and C_4 to resonance should give from 25 to 30 ma. grid current with the HY30Z loaded to 90 or 100 ma. plate current, and the 6AC5G plate current will run around 40 ma. The

key-up value of the 6AC5G plate current is less than 5 ma.

On 20 meters L_2 is plugged in S_2 , the 40-meter L_3 is in S_3 , the 20-meter L_3 is in S_4 and the 20-meter tank coil is in the HY30Z plate circuit. Tuning the circuits to resonance and loading the final to 90 ma., the grid current should be above 25 ma. and the 6AC5G currents will total about 70 ma.

The 28-Mc. final grid current should be over 20 ma. with the HY30Z loaded to 90 ma., and the total 6AC5G current will be about 90 ma. For this band, L_2 is plugged in S_1 and the 40-, 20- and 10-meter L_3 's go in S_2 , S_3 and S_4 respectively.

The coils used in the final amplifier are being run considerably above rating and, for this reason, some care should be exercised in using them. This means not operating the final unloaded for any length of time or else the coils will lose their shape because of the heat softening the plastic that holds the turns. For c.w. work the coils will work along merrily without any trouble, but for 'phone work it is advisable to go to a somewhat larger coil, such as the B & W Type BL or the Millen 100-watt coils (44080, etc.).

With 800 volts on the plate of the HY30Z, it will deliver about 50 watts on the bands mentioned. This is enough to satisfy the low-power man, or it is plenty to excite most 300- to 500-watt amplifiers.

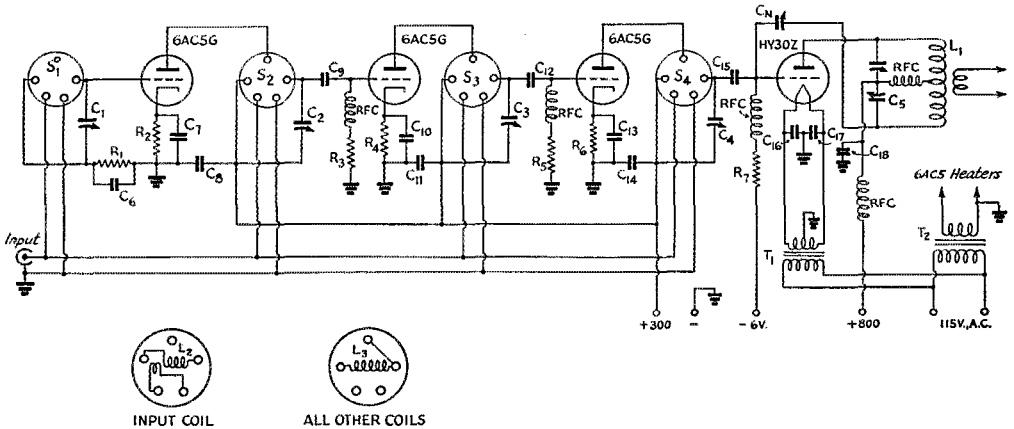


Fig. 1 — Wiring diagram of the 80-watt exciter unit.

C_1, C_2, C_3, C_4 — 100- μ fd. midget variable (Cardwell ZU-100-AS or Hammarlund HFA-100-A).
 C_5 — 100 μ fd. per section dual (National TMK-100D).
 C_N — 18- μ fd. neutralizing condenser (National STN).

$C_6, C_7, C_8, C_{10}, C_{11}, C_{13}, C_{14}, C_{16}, C_{17}$ — 0.005 μ fd. midget mica.
 C_9, C_{12}, C_{15} — 100- μ fd. midget mica.
 C_{18} — 0.001- μ fd., 2500-volt mica.
 R_1, R_3 — 20,000 ohms, 1-watt.
 R_2, R_4, R_6 — 500 ohms, 1-watt.

R_5 — 10,000 ohms, 1-watt.
 R_7 — 3000 ohms, 10-watt.
 RFC — 2.5-mh. r.f. choke (Millen 34101 or National R-100).
 S_1, S_2, S_3, S_4 — 5-prong sockets for coils.
 T_1, T_2 — 6.3 volts, 3-ampere transformer (Thordarson T19F97).

L_1 — Output tank coil for proper frequency (National AR16-C).
 L_2 — 3.5 Mc.: 36 turns No. 24 d.c.c., close-wound. Link is 7 turns No. 28 d.c.c., close-wound next to ground end of L_2 .
 L_3 — 7 Mc.: 16 turns No. 24 d.c.c., close-wound.

14 Mc.: 9 turns No. 24 d.c.c., spaced to occupy $\frac{1}{2}$ -inch winding length.
 28 Mc.: 4 turns No. 18 enam., spaced to occupy $\frac{1}{2}$ -inch winding length.
 L_2 and all L_3 are wound on 5-prong, 1-inch diam. form (Millen 45005).

● For the Junior Constructor —

A Lecher Wire System for U.H. Frequency Measurement

ONE of the well-known attractions of ultra-high frequency operation above 112 megacycles is the relative simplicity of the apparatus commonly used. But there is always one pressing question when trying out a new receiver or putting a transmitter on the air: "How can I tell whether I'm tuned in the band or not?" While the frequency-measurement technique used on lower frequencies can be extended to the ultra-highs (one of the simpler pieces of equipment for low-frequency measurements was described in this department last month¹) at 112 Mc. it becomes pretty complicated, both in operation and the minimum equipment required. And there are plenty of chances for picking the wrong harmonic somewhere along the way.

However, at 112 Mc. we can actually measure the length of the waves generated, which is getting right down to fundamentals. The measurement is made by observing standing waves on Lecher wires, a set of Lecher wires being nothing more than a two-wire transmission line. Such a line shows very pronounced resonance effects, and it is possible to determine quite accurately the points of maximum current (loops) along the line. The distance between two consecutive current loops is equal to a half wavelength, provided only that the line is completely air-insulated in the intervening length. Once the distance between two loops has been determined it can be measured with an ordinary ruler or yardstick, and the

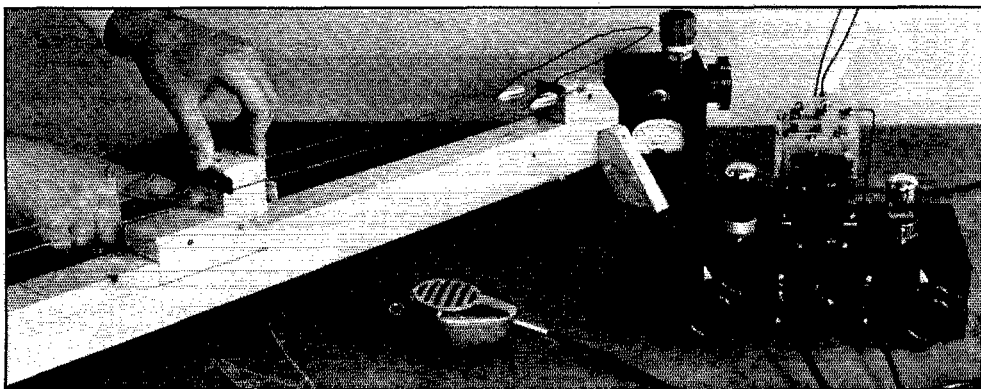
length is readily converted into frequency by a simple formula. And that is all the equipment and calibration required.

Two things are important in constructing the line: it should be at least a wavelength long, and it should be entirely air-insulated except where it is supported at the ends. The length is necessary to make sure that two current loops will fall on the line, and the air insulation to avoid any "slowing-down" of the waves which might take place if insulating spacers or stand-offs were used. The wires can be stretched tightly between any two convenient supports, using a spacing of an inch to an inch and a half. The positions of the current loops are found by means of a "shorting bar," which is simply a metal strip which can be slid along the line to vary its effective length.

Making Measurements

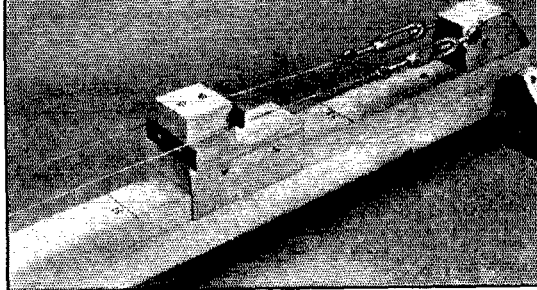
Resonance indications can be obtained in several different ways. Let us suppose the frequency of a transmitter is to be measured. A convenient and fairly sensitive indicator can be made by soldering the ends of a one-turn loop of wire of about the same diameter as the transmitter tank coil to a flashlight bulb, then coupling the loop to the tank coil to give a moderately-bright glow. A similar coupling loop should be connected to the ends of the Lecher wires and brought near the tank coil. Then the shorting bar should be slid along the wires outward from the transmitter until the lamp gives a sharp dip in brightness. This point should be marked (a piece of string can be tied on one of the wires) and the shorting

¹ "A 50-, 100- and 1000-ke. Oscillator for Band-Edge Spotting," *QST*, September, 1941.



The Lecher wire system set up for frequency measurement, using a crystal-detector wavemeter as a resonance indicator. Because this system makes possible very loose coupling to the oscillator, it will give more accurate readings than coupling the wires directly to the transmitter tank.

A view of the other end of the wires, showing the turnbuckles for maintaining tension. The slider carries the shorting bar, maintaining it at a fixed angle with the wires.



bar moved out until a second dip is obtained. Marking the second spot, the distance between the two points can be measured and will be equal to half the wavelength. If the measurement is made in inches, the frequency will be

$$F_{Mc.} = \frac{5906}{\text{length (inches)}}$$

If the length is measured in meters, the formula becomes

$$F_{Mc.} = \frac{150}{\text{length (meters)}}$$

A frequency of 112 Mc. corresponds to a length of just slightly less than $52\frac{3}{4}$ inches (1.34 meters) and 116 Mc. to $50\frac{2}{3}$ inches (1.29 meters).

In checking a superregenerative receiver, the Lecher wires may be similarly coupled to the receiver coil. In this case the resonance indication may be obtained by setting the receiver just to the point where the hiss is obtained, then as the bar is slid along the wires a spot will be found where the receiver goes out of oscillation. The distance between two such spots is equal to a half wavelength.

In either case, the most accurate readings result only when the loosest coupling between the line and the tank coil which will give a definite indication is used. After taking a preliminary reading to find the regions along the line in which resonance occurs, loosen the coupling until the indications are just discernible and repeat the measurement. Unless this is done the tuning of the line will affect the frequency of the oscillator and inaccurate indications will be obtained. As the coupling is loosened the resonance points will become sharper, which is a further aid to accurate determination of the wavelength.

The pick-up loop at the end of the Lecher wires need only be a half turn — actually just a closed end to the system. The line may be extended to any convenient length to bring the loop near the coupling coil, as shown in the photograph. The extension should have about the same wire spacing as the line and should be kept as symmetrical as possible; that is, it should have no unnecessary twists or kinks.

In using the shorting bar, make sure that it is always at right angles to the two wires. A sharp edge on the bar is desirable, since it not only helps make good contact but also definitely locates the *point* of contact.

Building a Lecher Wire System

The wires can be used more conveniently and with greater accuracy if they are mounted up in fairly permanent fashion and provided with a shorting bar maintained at right-angles to them. The construction shown in the photographs requires a little time but the cost is negligible, and both are well repaid in operating ease if frequent measurements are to be made. The support consists of two 12-foot pieces of "1 by 2" (actually about $\frac{3}{4}$ " by $1\frac{1}{2}$ "") pine fastened together with wood screws to form a "T" girder, this arrangement being used to minimize bending of the wood when the wires are tightened up. The anchors at the ends are also 1 by 2, cut and screwed together to make a block. The feet at each end keep the assembly from tipping over when in use. The wires terminate in airplane-type strain insulators at one end, and at the other in small turnbuckles for taking up the slack. In the set-up shown, turnbuckles and wire both came from the local five-and-dime store, the wire being bare solid copper antenna wire (hard-drawn) of about No. 16 gauge. The turnbuckles are held in place by a $\frac{3}{16}$ by 2-inch bolt through the anchor block. This end of the line is thus short-circuited; it does not matter whether it is open or shorted since the other end is the one connected to the pickup loop.

The sliding gadget, also made from pieces of 1 by 2, serves the double purpose of holding the shorting bar and acting as a guide to keep the wire spacing constant. Sheet metal pieces screwed to the sides of the sliding block are bent under the horizontal member of the "T" to keep the block in place. At the back is a horizontal strip of bakelite to keep the wires pressed close to but not actually touching the shorting bar. This

(Continued on page 98)

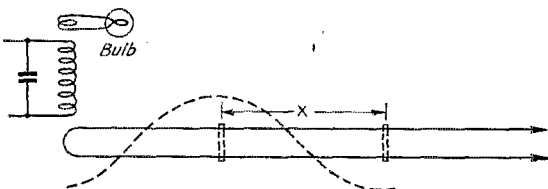


Fig. 1 — Coupling the Lecher wires to a transmitter tank coil. Typical standing-wave distribution is shown, with positions of the shorting bar at current loops indicated. The distance "X" equals a half wavelength.

★ WHAT THE LEAGUE IS DOING ★

CLASS A CONTINUED: TRANSFER OF FREQUENCIES POSTPONED

SINCE the publication of our September editorial on the temporary loan of part of our 80-meter band for the aircraft pilot-training program, two important developments have occurred:

(1) The first step in the withdrawal of our frequencies, originally expected for September 1st, has been deferred to December 20th, unless sooner advanced upon thirty days' notice. No vacating of 80-meter c.w. or 160-meter 'phone frequencies will be necessary until then. The War Department has studied the progress of its pilot-training program to determine how long it could defer asking us to vacate the frequencies — really trying to give us every break. They will begin a partial use of 3800–3900 on about October 1st, with a certain amount of interference inevitable through the shared use, but with a desire on their part to defer the actual vacating by us until they are ready for full-fledged operation. The right is reserved to advance the date of our vacating if plans mature earlier than expected, and we shall not go scot-free of interference after October, but the chances are that we won't have to move until December 20th.

(2) FCC has decided to retain the requirement of a Class A license for 4-Mc. and 14-Mc. 'phone operation, although the new 7-Mc. 'phone assignment will become open to all amateurs in continental U. S. A. on December 20th. To this extent, the table appearing in the public notice of July 22d is amended. The announcement of the temporary diversion of 300 kc. of our band met with an almost complete amateur understanding of the need. But, conversely, the reactions received at ARRL headquarters, and the opinions of ARRL directors, were almost equally uniform in the feeling that it was both undesirable and unnecessary to eliminate the Class A requirement for 75 and 20 'phone. The League therefore suggested to the Commission that the changes would find a great deal more acceptance if Class A were retained, and this FCC decided to do in issuing its first order concerning the loan.

It is to be emphasized that none of these changes is yet effective and that they will apply only to continental United States. In K4, K6 and K7 the 160 and 80 bands are not disturbed, nor will 40-meter 'phone be authorized.

Under its Docket No. 6195, FCC on August 22d issued its first order in the series, the ordering portions of which read as follows:

IT IS ORDERED that Sections 12.111 and 12.115 of Part 12 of the Rules and Regulations of the Commission,

insofar as they pertain to the continental limits of the United States, BE, AND THEY ARE HEREBY, SUSPENDED UNTIL FURTHER ORDER OF THE COMMISSION;

IT IS FURTHER ORDERED that the following Temporary Rules Governing Amateur Radio Stations be effective during the period of the suspension of the foregoing sections:

Temporary Rule 12.111. *Frequencies for exclusive use of amateur stations.* — The following bands of frequencies are allocated exclusively for use by amateur stations subject to change with respect to 3650–3800 kilocycles and 3900–3950 kilocycles upon further order of the Commission:

1,750 to 2,050 kilocycles	28,000 to 30,000 kilocycles
3,500 to 3,800 kilocycles	56,000 to 60,000 kilocycles
3,900 to 4,000 kilocycles	112,000 to 116,000 kilocycles
7,000 to 7,300 kilocycles	224,000 to 230,000 kilocycles
14,000 to 14,400 kilocycles	400,000 to 401,000 kilocycles

Provided, however, that amateur licenses located in the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, North Dakota, South Dakota, Wyoming, Montana, Idaho, Oregon, and Washington may use the frequencies in the band 3800–3900 kilocycles for Type A-1 emission during the period between two hours after local sunrise and two hours before local sunset subject to the condition that no interference is caused to government operation on these frequencies. The privilege conferred by this proviso with respect to any amateur or to the amateurs within any area may be terminated at any time without advance notice or hearing should interference develop.

Temporary Rule 12.115. *Additional bands for types of emission using amplitude modulation.* — The following bands of frequencies are allocated for use by amateur stations using additional types of emission as shown:

1,750 to 1,900 kilocycles	—	—	A-4	—
1,900 to 2,050 kilocycles	—	A-3	—	—
7,250 to 7,300 kilocycles	—	A-3	—	—
28,100 to 30,000 kilocycles	—	A-3	—	—
56,000 to 60,000 kilocycles	A-2	A-3	A-4	—
112,000 to 116,000 kilocycles	A-2	A-3	A-4	A-5
224,000 to 230,000 kilocycles	A-2	A-3	A-4	A-5
400,000 to 401,000 kilocycles	A-2	A-3	A-4	A-5

This order shall take effect on the 20th day of December, 1941; *Provided, however,* That should need therefor arise, the Commission may, by subsequent order, advance the effective date hereof to a date prior to December 20, 1941, but not less than thirty (30) days from the date of this action.

ARMY MANEUVERS

AMATEURS in different parts of the country are encountering Army stations this summer operating in the 3500–3900 range. This does not mean that the War Department is taking over all of our band ahead of time and ruining it in violation of the understanding with amateurs. These are the usual summer maneuvers, and the operation of such Army mobile sets for this temporary period has long been authorized in our 3.5 band — and on many other bands of frequencies as well. It derives from an executive order and is nothing more than we have had for years back except that this year the maneuvers are larger. In any one section of the country,

however, they last for only a few weeks. This use has no connection with the pilot-training program for which we are soon to vacate some of our frequencies.

Amateurs should not attempt to crash these Army nets, but we understand that it is OK to communicate with them at *their initiative*: if they call you, or come to see you and ask your help. FCC's rules on the subject:

2.91. *National defense preparation by free service.* — Any common carrier or the licensee of any radio station subject to the Communications Act may utilize its facilities to render free service to the government for military or Naval communications in preparation for national defense. The government agency concerned will keep the Commission generally informed of the services of this kind accepted. Nothing herein or in any other regulation of the Commission shall be construed to require any such carrier or station to participate in any such communication.

2.92. *National defense-emergency authorization.* — The Federal Communications Commission may authorize the licensee of any radio station during a period of national emergency to operate its facilities upon such frequencies, with such power and points of communication, and in such a manner beyond that specified in the station license as may be requested by the Army or Navy.

REGISTER AVAILABILITY FOR JOBS!

THE League continues to receive many appeals to find amateurs for radio jobs — in the services, the defense laboratories and in the radio industry. If you are available or would consider a change, please register your Qualifications with ARRL by means of the blank appearing in February *QST*, page 25, or a "reasonable facsimile thereof."

CITIZENSHIP SHOWING

ORDER 76-A is not being extended. Many amateurs with expiring licenses are operating until September 30th by virtue of this order, having filed a showing of citizenship and an application for renewal. If you have not received your new license, it is probably because you have not made a satisfactory demonstration of citizenship or filed a timely application for renewal. There are possibly several hundred amateurs who will have to go off the air September 30th. It represents a sort of deadline by which time the showing of citizenship must be completed to the satisfaction of the Commission. If you have not yet fully complied with their requirements, we urge you to make a tremendous effort to do so immediately so that you may continue operating.

FINANCIAL STATEMENT

FROM the business standpoint, the second quarter of this year was somewhat better than it was in similar periods in recent years, income being down but expenses more than proportionately reduced. The operating statement is here presented for your information, by order of the Board of Directors.

STATEMENT OF REVENUE AND EXPENSES, EXCLUSIVE OF EXPENDITURES CHARGED TO APPROPRIATIONS, FOR THE THREE MONTHS ENDED JUNE 30, 1941

REVENUES	
Membership dues	\$10,074.78
Advertising sales, <i>QST</i>	19,510.07
Advertising sales, Handbook	5,328.50
Newsdealer sales, <i>QST</i>	9,484.46
Handbook sales	8,561.94
Spanish edition Handbook revenues	3,147.75
Booklet sales	3,225.18
Calculator sales	214.36
Membership supplies sales	1,782.73
Interest earned	398.24
Cash discounts received	213.01
Bad debts recovered	20.70
	\$61,961.72
<i>Deduct:</i>	
Returns and allowances	\$ 2,858.05
Cash discounts allowed	448.29
Exchange and collection charges	70.54
	\$ 3,376.88
<i>Less:</i> decrease in reserve for newsdealer returns of <i>QST</i>	204.31
	3,172.57
Net Revenues	\$58,789.15
EXPENSES	
Publication expenses, <i>QST</i>	\$13,399.54
Publication expenses, Handbook	5,138.64
Publication expenses, booklets	1,232.18
Publication expenses, calculators	168.21
Spanish edition Handbook, expenses	1,427.67
Salaries	22,046.58
President's defense expenses	13.15
Membership supplies expenses	1,484.82
Postage	1,161.91
Office supplies and printing	1,772.40
Travel expenses, business	1,413.54
Travel expenses, contact	284.40
<i>QST</i> forwarding expenses	1,011.56
Telephone and telegraph	577.34
General expenses	931.38
Insurance	167.49
Rent, light and heat	1,129.25
General Counsel expenses	268.41
Communications Department field expenses	176.68
Headquarters Station expenses	301.36
Alterations and repairs expenses	248.82
Bad debts charged off	8.56
Provision for depreciation of:	
Furniture and equipment	263.23
Headquarters Station	153.76
	\$54,780.88
Total Expenses	\$54,780.88
Net Gain before expenditures against appropriations	\$4,008.27

ELECTION NOTICE

To all members of the American Radio Relay League residing in the Atlantic, Dakota, Delta, Midwest, Pacific and Southeastern Divisions:

YOU are hereby notified that, in accordance with the constitution, an election is about to be held in each of the above-mentioned divisions to elect both a member of the ARRL Board of Directors and an alternate thereto for the 1942-1943 term. Your attention is invited to Sec. 1 of Article IV of the constitution, providing

for the government of ARRL by a board of directors; Sec. 2 of Article IV, and By-Law 12, defining their eligibility; and By-Laws 13 to 24, providing for the nomination and election of division directors and their alternates. Copy of the Constitution and By-Laws will be mailed any member upon request.

Voting will take place between November 1st and December 20, 1941, on ballots that will be mailed from the headquarters office in the first week of November. The ballots for each election will list, in one column, the names of all eligible candidates nominated for the office of director by ARRL members residing in that division; and, in another column, all those similarly named for the office of alternate. Each member will indicate his choice for each office.

Nomination is by petition. Nominating petitions are hereby solicited. Ten or more ARRL members residing in any one of the above-named divisions may join in nominating any eligible member of the League residing in that division as a candidate for director therefrom, or as a candidate for alternate director therefrom. No person may simultaneously be a candidate for the offices of both director and alternate. Inasmuch as the by-laws were recently amended to transfer all the powers of the director to the alternate in the event of the director's death or inability to perform his duties, *it is of as great importance to name a candidate for alternate as it is for director.* The following form for nomination is suggested:

Executive Committee

*The American Radio Relay League
West Hartford, Conn.*

We, the undersigned members of the ARRL residing in the Division, hereby nominate of, as a candidate for DIRECTOR; and we also nominate of, as a candidate for ALTERNATE DIRECTOR; from this division for the 1942-1943 term.

(Signatures and addresses)

The signers must be League members in good standing. The nominee must have been both a member of the League and a licensed radio amateur operator for a continuous term of at least four years immediately preceding receipt by the Secretary of his petition of nomination, except that a lapse of not to exceed ninety days in the renewal of the operator's license and a lapse of not to exceed thirty days in the renewal of membership in the League, at any expiration of either during the four-year period, will not disqualify the candidate. He must be without commercial radio connections: he may not be commercially engaged in the manufacture, selling or renting of radio apparatus normally capable of being used in radio communication or experimentation, nor commercially engaged in the publication of radio literature intended, in whole or part, for con-

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.

sumption by licensed radio amateurs. Further details concerning eligibility are given in By-Law 12. His complete name and address should be stated. The same requirements obtain for alternate as for director. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon EST of the 20th day of October, 1941. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of alternate. To be valid, a petition must have the signatures of at least ten members in good standing; that is to say, ten or more members must join in executing a single document; a candidate is not nominated by one petition bearing six signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are frequently found not to be members in good standing. It is not necessary that a petition name candidates both for director and for alternate but members are urged to interest themselves equally in the two offices.

Classification of members into Full Members and Associates is still in process, occurring at time of renewal throughout the coming year. Members possessing certificates of Full Membership, and members not yet classified and holding valid old-style membership certificates, may nominate candidates, or may stand as candidates if otherwise eligible. But members holding certificates of Associate Membership are not eligible to either function.

Present directors and alternates for these divisions are as follows: Atlantic Division: director, Walter Bradley Martin, W3QV; alternate, Herpert M. Walleze, W8BQ. Dakota Division: director (removed from division), Fred W. Young, W9MZN; alternate (acting director), Adolphus A. Emerson, W9ITQ. Delta Division: director, E. Ray Arledge, W5SI; alternate, E. H. Treadway, W5DKR. Midwest Division: director, Floyd E. Norwine, Jr., W9EFC; alternate, Samuel C. Wallace, W9FAM. Pacific Division: director, J. L. McCargar, W6EY; alternate, Elbert Amarantes, W6FBW. Southeastern Division: director, William C. Shelton, W4ASR; alternate (now removed from division), Bennett R. Adams, jr., W4EV.

These elections constitute an important part

(Continued on page 98)

The Decade Calibrator

An Inexpensive Frequency Checker

BY R. B. JEFFREY,* W8GDC

SINCE passage of Rule 152.44 by the F.C.C., requiring a procedure for regularly checking the frequency of amateur stations, increased interest has been shown in frequency meters and similar measuring equipment. Most of the instruments available to the average amateur are quite complicated to build and expensive to buy, and it was thought that if a simple and cheap instrument for frequency checking were available, not only would more hams see fit really to comply with the regulations, but they could at the same time begin to appreciate some of the fun there is in being able to know instead of guess at both your own and the other fellow's frequency.

In general, we have found frequency meters, as distinguished from frequency standards, to be unsatisfactory for ham use. In order to calibrate or to reset a frequency meter operating in the amateur bands it is necessary to have a frequency standard also, but if we have a frequency standard the frequency meter is quite unnecessary. So we have tried to develop a secondary frequency standard which is simple, reasonably accurate, and inexpensive. The one to be described is built around the old familiar 100-kc. oscillator. However, a 100-kc. oscillator by itself leaves much to be desired, as anyone who has tried to use one in the 10- or 20-meter bands can testify. On the higher frequencies it is almost impossible to count 100-kc. beats with any degree of accuracy, and we are quite likely to find ourselves listening to the 14,100-kc. beat when we thought we had the 14,000-kc. point. And an unmodulated note is also hard to identify in the presence of the numerous idling carriers that are often to be found on the higher frequencies.

These difficulties are solved by including a 1000-kc. oscillator and an audio oscillator in the frequency standard. This is arranged so that modulation from the audio oscillator can be applied to either the 100- or the 1000-kc. oscillator, although normally it is applied only to the 1000-kc. signal. This gives us the name "Decade," since every tenth beat in the receiver (or monitor) will be modulated. In operation, the harmonics practically count themselves. We can easily locate which 1000-kc.

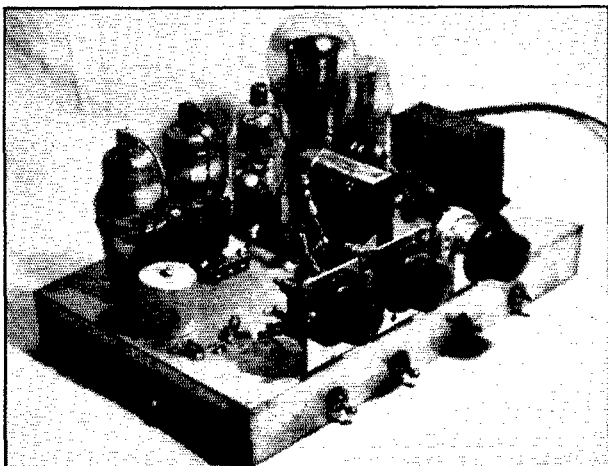
* 1428 Ridge Ave., Zanesville, Ohio.

A 100-1000-kc. oscillator combination with provision for tone modulation for identification purposes. Simple in design, but capable of quite high accuracy. The cost is low, too.

harmonic we are hearing, either by identifying adjacent stations or by means of an absorption wavemeter, and then count 100-kc. points between the modulated notes with a high degree of accuracy.

Circuit Considerations

Considerable experimentation with various types of oscillator circuits, including electron-coupled, resulted in the choice of the circuit shown in Fig. 1. It is preferable to the electron-coupled circuit for this type of service because it permits the cathode to be operated at ground potential for r.f. and eliminates some of the troubles caused by heater-cathode capacitance appearing across the tuned circuit, and changes caused by expansion of the heater. Perhaps the disadvantages of the e.c.o. would not be so noticeable if the heaters were operated in parallel from a 6-volt filament transformer, but with series heaters the separate triode oscillator-pentode amplifier combination



A general view of the decade calibrator. Rotating controls are mounted on small individual panels, so that when the unit is installed in a cabinet no parts need be fastened to the panel.

results in better performance. And it allows the use of standard, easily obtainable oscillator coils.

In order to keep down the number of tubes the 6F7 triode-pentode was chosen for the oscillators. The 6F7 pentode section is adequately shielded for r.f. service without neutralization if a tube shield is used. The use of a triode oscillator and separate amplifier removes the automatic correction for plate voltage changes which is supposed to be one of the chief advantages of the e.c.o., but this effect is of little importance since an instrument of this type should always have voltage regulation. In this case, it is secured by the use of an 874 regulator tube. A VR-105 would work just as well and costs less, but we happened to have the 874. It has the advantage of regulating at 90 volts; those using a VR-105 should be careful to use a low-resistance filter choke designed especially for a.c.-d.c. sets because under low line-voltage conditions, the drop through the choke may prevent the VR-105 from striking. The regulator tube holds the plate voltage constant within one volt from no load to full load; that is, switching on additional oscillators does not, under the worst line-voltage conditions, change the plate voltage more than one volt. The two r.f. amplifiers are allowed to run constantly to act as a bleeder and further stabilize the plate voltage.

The a.c.-d.c. power supply may look odd, but there are several good reasons for its use. With no voltage step up, line voltage changes are not multiplied as they would be if a power transformer were used, and 90 volts is all that is needed. If a higher plate voltage were used, some kind of attenuator network would be required in the output circuits. There might be an advantage in using a filament transformer and operating the heaters in parallel, in which case an 84 would be substituted for the 25Z5. If this were done, the filaments could be allowed to run constantly and the standard would always be ready for use. However, we omitted the filament transformer in the interests of economy; the 250-ohm filament resistor was obtained from the junk box!

All three oscillators employ the same circuit, a tickler-feedback triode oscillator driving a pentode amplifier. The only reason for the amplifier stages is to isolate the oscillators from changes in loading in the output circuit. With the values shown, shorting either of the r.f. output terminals to chassis produces a change of only a few cycles in the oscillator frequency, and no change in the audio oscillator frequency is detectable when its output is shorted to chassis.

The audio oscillator may need some explanation. T_1 should be the worst audio transformer obtainable, the less core the better. Most new transformers are too good for use in an oscillator

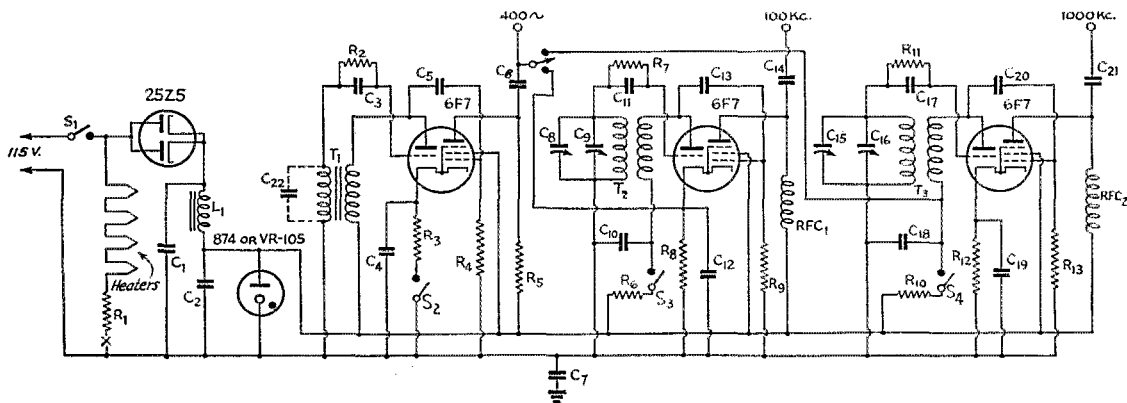


Fig. 1 — Circuit Diagram of the Calibrator.

- R₁ — 250 ohms, 25-watt.
- R₂ — 0.75-megohm, ½-watt.
- R₃ — 1250 ohms, 1-watt.
- R₄ — 0.2-megohm, ½-watt.
- R₅ — 0.1-megohm, ½-watt.
- R₆ — 50,000 ohms, ½-watt.
- R₇ — 0.75-megohm, ½-watt.
- R₈ — 500 ohms, 1-watt.
- R₉ — 0.2-megohm, ½-watt.
- R₁₀ — 50,000 ohms, ½-watt.
- R₁₁ — 0.75-megohm, ½-watt.
- R₁₂ — 500 ohms, 1-watt.
- R₁₃ — 0.1-megohm.
- L₁ — Midget filter choke.
- T₁ — 3/1 ratio audio.
- T₂ — Interruption oscillator coil (National OSR)

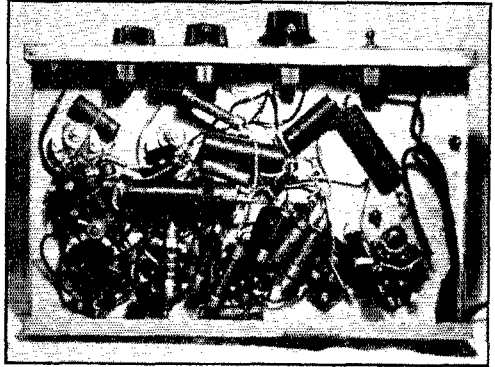
- T₃ — B.c. oscillator coil. (See text.)
- RFC₁ — 80-mh. r.f. choke.
- RFC₂ — 2.5-mh. r.f. choke.
- C₁ — 16-μfd., 150-volt electrolytic.
- C₂ — 16-μfd., 150-volt electrolytic.
- C₃, C₄, C₅, C₆, C₁₂, C₁₈, C₁₉ — 0.01-μfd. paper.
- C₇ — 0.5-μfd. paper.
- C₈, C₁₅ — 10-μfd. variable.
- C₉, C₁₆ — 100-μfd. padder.
- C₁₀ — 0.1-μfd. paper.
- C₁₁, C₁₃, C₁₇, C₂₀ — 100-μfd. mica.
- C₁₄, C₂₁ — 50-μfd. mica.
- C₂₂ — (See text.)
- S₁, S₂, S₃, S₄ — S.p.s.t. toggle switch.
- S₅ — S.p.3-t. rotary (Yaxley 3223J).
- X — Link in regulator tube base. (See text.)

circuit as the frequency will be too low. For our purposes we want a frequency of about 400 to 500 cycles, and if the frequency of the audio oscillator is lower than this, it can be raised either by reducing the value of C_4 (and possibly C_3), which will also reduce the power output, or by removing part of the core of T_1 . The latter is preferable. Remove enough iron to raise the frequency to about 1000 cycles, then tune the oscillator by adding capacity across the secondary, as shown by C_{22} . Since all transformers are likely to be different, the size of this condenser will have to be found by trial. In our case, using an old 3/1 ratio audio transformer that dates back to the days of 201A tubes, no tuning condenser or removal of iron was found necessary.

It will be noted that two different methods of modulating the r.f. oscillators were used. This was the result of trial of several methods, including plate, screen, plate-and-screen, and cathode modulation of the amplifiers, and plate modulation of the oscillators. The methods shown caused the least reaction on the frequencies of the r.f. oscillators. In any case, modulation over about 20% is not wanted, and this low percentage should not affect the frequency of the 1000-ke. oscillator. In practice, it is very hard to determine an exact zero beat with a modulated note, but as nearly as we could tell the application of modulation did not change the frequency of either r.f. oscillator more than 20 or 30 cycles on the fundamental. All zero beat settings should, of course, be made with unmodulated signals.

Plate and grid circuits of the amplifier stages should be separated from each other as much as possible, and the tubes should be shielded. All parts must be mounted rigidly to prevent mechanical shocks from reacting on the frequency. It was thought advisable to use manufactured coils for T_2 and T_3 . T_2 is an interruption oscillator coil used in the separately-quenched 5-meter rigs of a few years back, and is still available. T_3 in our setup was the oscillator coil out of an old Philco receiver; a b.c. replacement coil such as the Meissner No. 14-1028 or 14-7560, or their 17-9373 phonograph oscillator coil should be entirely satisfactory. The unit is built on a $7 \times 11 \times 1\frac{1}{2}$ inch chassis. The two variable condensers are old midgets of assorted makes cut down to one stator and one rotor plate each, and C_3 has double spacing between the two plates. S_5 is mounted on a bracket at the same height as the condensers. This type of mounting makes the unit independent of the cabinet, and thus much easier to wire and adjust.

Aside from keeping plate and grid circuits separated, no unusual wiring precautions need be observed. All parts should be tied down, resistors and condensers supported at both ends either by socket terminals or by tie points, as a precaution against vibration. Ordinary hookup wire is run by the shortest route from one point to



An underside view, showing the general placement of parts.

another after the manner of a.c.-d.c. b.c. sets. All negative returns are made to a negative bus which runs through the set and is insulated from the chassis. C_7 provides an r.f. and audio ground to the chassis without grounding the line so that the chassis may be — in fact it should be — grounded during operation. The filament circuit is wired through the link provided in the base of the regulator tube ("X" on the diagram) so that the heater circuit will be open if the regulator is not in its socket. This is not important, but does prevent errors.

Operating Notes

Usually a piece of wire from 3 to 10 feet long connected to each r.f. output jack will provide sufficient signal in the receiver, or the two r.f. outputs may be connected together and to a common antenna. Coupling to the receiver is varied by changing the length and proximity of the antenna on the standard. When first tuning up the unit, set C_3 to half scale, tune in WLW (in the west a station on 600 or 800 kc. should be used) and, with S_3 on, S_4 and S_5 off, adjust C_9 until a beat note is heard. Now tune the receiver toward the high-frequency end of the broadcast band and see if a beat is heard every 100 kc. You may have to identify the stations where beats are heard, unless the receiver dial is known to be accurate. Probably the beats will *not* be heard every 100 kc. unless you are lucky. If they are more or less than 100 kc. apart, change the setting of C_9 until another beat is heard on WLW, and try again. Eventually a setting of C_9 will be found that gives a beat on every 100-ke. point (i.e., 500, 600, 700, 800, etc.) in the broadcast band. The oscillator is then tuned to 100 kc. Now turn S_4 on and tune the receiver to 1000 kc. Adjust C_{16} , with C_{15} at midscale, until a beat is heard. Now tune the receiver to 4000 kc. (identified as the last 75-meter 'phone) and see if there is another beat there. If so, check WWV at 5000

(Continued on page 94)

An Inexpensive Automatic Line-Voltage Regulator

BY S. GORDON TAYLOR,* W2JCR

DURING a series of reception tests at a portable location difficulty was experienced because of line voltage variations, and in searching for some inexpensive, simple and preferably automatic means for maintaining the voltage more nearly constant a stunt was worked out which proved so successful that the dope is being passed along for the benefit of others whose receiving and transmitting equipment suffers from abnormally wide line variations.

The unit to be described can be built up in a half hour or so from parts which cost a total of something over three dollars. Some of the few parts involved will be found around many shacks, reducing the cost by just that much. The regulation obtained is entirely automatic. Its effectiveness is demonstrated by the following measurements made on a set-up in which a Hallicrafters SX-17 constituted the load:

Line Voltage	Regulated Voltage Applied to Load
100	108
105	111
110	113
115	113
120	113
125	114
130	115

While this regulation is not perfect, it is certainly adequate to meet any reasonable requirements of ham receiver and transmitter operation.

The regulator is capable of controlling loads up to about 165 watts. However, it is entirely feasible to employ several such units to regulate

* 2505 Aqueduct Ave., New York City.

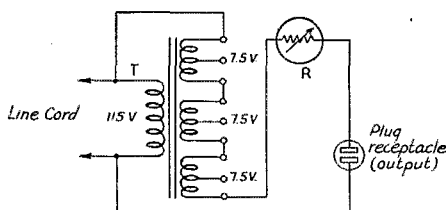


Fig. 1—A four-winding filament transformer is connected as shown at T, to serve as a voltage boosting auto-transformer. The Amperite voltage regulator tube serves as an automatic check valve, absorbing surplus voltage and allowing only a normal operating value to be applied to the receiver or transmitter plugged into the output of the regulator.

the voltage applied to the different power supplies in a transmitter. In the case of the plate supply for high-power tubes it cannot be used. It can, however, be employed to regulate the filament voltage to such tubes, thus dispensing with the manually-controlled rheostat commonly used for this purpose. It might even be possible to use two or more of the regulator tubes in parallel to take care of loads up to several hundred watts, but this is an angle that has not been investigated.

Principle of Operation

The heart of this automatic control unit is the Amperite voltage regulator tube. This is a constant current device in which any tendency for the current to rise above a predetermined value causes the internal resistance of the tube to increase to offset the increase in current flow. These tubes are standard in twelve current ratings, ranging from the 2A5 for load currents to about 0.24 amp., to the 13A5 for currents of 1.3 to 1.45 amp.

Because the tube is a resistance device it can only function to *reduce* supply voltages. Usually, however, widely varying line voltages may be excessive at one hour of the day and subnormal at another. An effective voltage regulator must therefore be capable of adding voltage when the line is low and subtracting it when the line is high. To accomplish this a booster transformer is included which adds approximately 22.5 volts to the existing line voltage before it is applied to the Amperite and its load. Thus the initial voltage is always excessive and allows complete freedom for downward control by the tube. With high line voltage the drop across the Amperite exceeds the boosting voltage with the result that the voltage applied to the load is less than the line voltage. On the other hand, with low line voltage the drop across the Amperite is less than the boost supplied by the transformer and the voltage applied to the load will therefore be higher than the line. This will be evident from a study of the regulation figures given above. There it will be seen that with line voltages up to 113 the load receives increased voltage while with line voltages above this value the applied voltage is less than the line.

The booster transformer should preferably be capable of providing about 20 to 25 volts boost, and the best one found for the purpose was the Lafayette Type K-2033 filament transformer.

Does your voltage soar in the daytime and dive at night? If so, you'll be interested in this simple line-voltage regulator. Inexpensive, fully automatic, and capable of handling the power taken by most devices in which voltage is critical for long life of tubes and other components.

This has three secondaries of 7.5 volts each, rated at 3 amp. When these and the primary are all connected in series the result is an autotransformer capable of delivering 137.5 volts at a normal input of 115 volts.

The regulator unit shown in the accompanying photograph consists of a wood base on which are mounted the transformer, a 4-prong socket for the Amperite and an ordinary line receptacle. The transformer is mounted with its terminal panel down in order to prevent accidental contact with its live terminals. The socket and receptacle are standard Amphenol types which lend themselves readily to breadboard mounting, having a metal base with knockouts through which leads are brought out the sides.

To connect the four windings of the transformer in series it is necessary, of course, to maintain the proper phase relationship if their voltage is to be additive. First connect the 115-volt terminals to the line, then connect one of them to one terminal of one of the 7.5-volt windings. Properly connected this will provide a total voltage of 122.5 (assuming the line voltage to be 115). If improperly connected the total voltage will be 107.5; in such a case the connection from the 115-volt winding should be transferred to the opposite end of the secondary. Next connect the free end of this secondary to another 7.5 volt winding to give a total voltage of 130, and then repeat this process with the last secondary. In case an a.c. voltmeter is not available a 115-volt lamp may be used as an indicator and correct connections judged by its brilliance. A difference of 7.5 volts will be readily noticeable.

If desired, the regulator can be incorporated directly in the equipment which it is to control. The only consideration is that there must be adequate ventilation, since the Amperite radiates considerable heat when operating at high line voltage — dissipating up to approximately 40 watts in some cases.

The wiring circuit is shown in Fig. 1 and requires no elaboration.

Selecting the Correct Regulator Tube

Once the regulator has been built it will serve to control any equipment within the current range of 0.2 to 1.45 amperes by inserting the proper Amperite in the socket. To determine which type is required it is only necessary to measure the current drawn by the load at normal 115-volt input. If an a.c. ammeter is not available a one- or two-ohm resistor can be connected in series with the load and the a.c. voltage drop across it measured. Dividing this voltage by the resistance will give the current.

Having determined the current, refer to Fig. 2 and locate the curve in which it falls. The number at the right-hand end indicates the Amperite type required for this particular load. Best regulation will be obtained if the current value falls at a point where the voltage drop across the Amperite will be approximately equal to the booster voltage. This will mean that at normal line input of 115 volts the voltage drop of the Amperite just offsets the boosting voltage with the result that the output voltage of the regulator will also be 115 volts and its regulating action will center around this value. Should the normal current value of the load fall toward the lower end of a curve where the drop is around 10 to 16 volts, for instance, regulation will be improved if the load current is increased by shunting a resistor of suitable value across the load. Thus if the measured load is 0.81 amp. it can be boosted to 0.88 amp. (which occurs at the 22.5-volt point on the 8A5 curve and therefore equals the booster value) by a shunt resistor to dissipate the difference of 0.07 amp. Its value can be determined

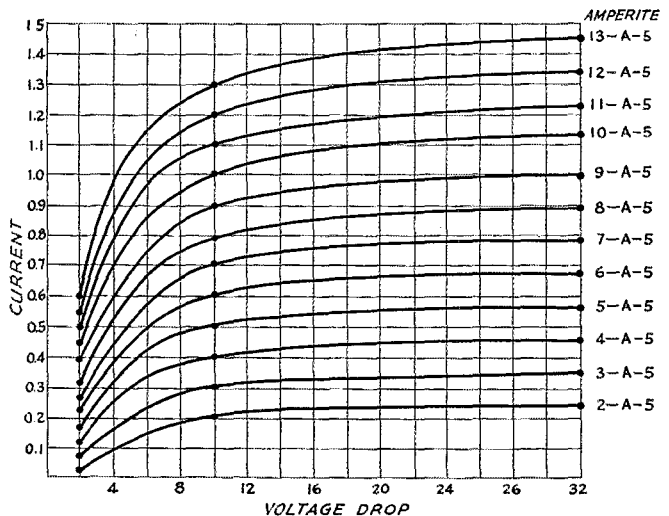


Fig. 2 — Chart for use in selecting the correct regulator tube type for any given value of normal load current. Although the chart cuts off at 32 volts, all except the lowest current tubes will safely dissipate up to 40 watts and the highest current tubes even more.

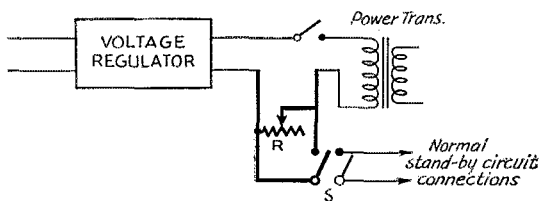


Fig. 3—Wide variations in load current, such as those resulting when a receiver constitutes the load and its "send-receive" switch is thrown to the stand-by position, can be compensated for by automatically inserting a suitable resistor in the supply line when the switch is thrown. For this purpose a d.p. switch is substituted for the usual single pole stand-by switch. The minor circuit change required in the receiver is shown here by the heavy lines.

by dividing the normal line voltage by this current, and in this particular case would be $115/0.07$ or 1640 ohms. This resistor would have to dissipate 115×0.07 , or about 8 watts. A 10-watt resistor of 1500 or 1750 ohms will be close enough.

Where the load values are lower than about 0.8 amp. it will be noticed from Fig. 2 that the curves of the various tubes do not overlap. Thus a normal drain of 0.58 amp. would fall between the ranges of the 5A5 and the 6A5 Amperites. In such a case a suitable shunt across the load will bring the total drain within the range of the 6A5. This shunt resistor will, of course, have no effect on the operation of the receiver or transmitter which constitutes the load.

Providing for Variable Loads

There is one important consideration which must be borne in mind when using this voltage regulator: It will provide proper regulation only if the load remains reasonably constant. It would not do, for example, to employ it in conjunction with a transmitter which draws perhaps 150 watts when operating and possibly only half this power when in the stand-by position. This decreased drain would result in materially reduced voltage drop across the Amperite and a proportionate increase in the voltage applied to the transmitter.

This same consideration applies where a receiver's plate voltage is cut off by the stand-by switch. In the case of the receiver tests mentioned earlier this obstacle was overcome by installing an adjustable resistor in the receiver and substituting a double-pole toggle switch in place of the receiver's original "send-receive" switch. The circuit arrangement is shown in Fig. 3. When this switch is thrown to the stand-by position it automatically inserts the resistance in series with the receiver supply line. The resistor is adjusted to a value which will reduce to normal the voltage applied when the switch is in the stand-by position.

This same arrangement can be applied to transmitters or other equipment in which the same conditions are encountered. In any case it must

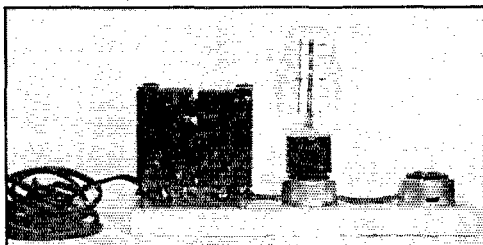
be borne in mind that the resistor may have to dissipate considerable power and it should be one rated accordingly. The heat dissipated is usually not an important consideration even where the resistor is mounted in the receiver because such dissipation occurs only while the receiver or transmitter is idling and when its other components are running cool.

If a controlled circuit is completely opened in the stand-by position no special provision has to be made. Where load variations are instantaneous, as in the case of modulation peaks in the audio system, they do not affect the voltage regulation since the Amperite does not follow variations of less than about one second duration.

When the regulator is employed to control equipment which draws both filament and plate power, a problem is presented by the relatively low current flow during the time the tubes are heating and before plate current is drawn. During this period the total drain may be only a fraction of the normal value for which the regulator is designed. As a result the voltage is likely to be excessive and regulation negligible. There are several ways in which this problem can be met.

Where a series resistor has been incorporated in the equipment for control by the stand-by switch, as in Fig. 3, it is only necessary that the switch be in the stand-by position when the equipment is turned on. Then when this switch is thrown to the operating position, after a delay of about 30 seconds, the plates will immediately draw current and establish the normal current flow. The drawback to this arrangement is that one may forget to throw the stand-by switch to its idling position before turning on the power.

A more effective scheme is the switching arrangement of Fig. 4, employing a 6-contact three-position switch. When this switch is in position No. 1 the line is disconnected entirely. In position No. 2 the controlled equipment is connected directly across the transformer primary and therefore across the line. At the same time the Amperite is shunted directly across the 22½-volt booster winding. The advantage of this is that the Amperite is warming up in readiness for instant operation at the same time that the filaments of



A close-up view of the automatic voltage regulator. The total cost of parts is \$3.35.

the controlled equipment are heating; also, no booster voltage is applied to the receiver during this period. In position No. 3 the normal operating condition is obtained with full automatic regulation.

The only precaution to be observed is to leave the switch in position No. 2 for 20 to 30 seconds when turning on the equipment. If this is done then at no time does the load receive voltage higher than that provided by the line itself. Even though the line voltage is high, say up to 130 volts, it would be applied only for the few seconds

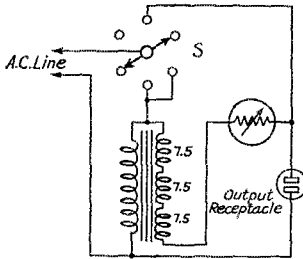


Fig. 4 — A more effective switching arrangement.

while the switch is in the No. 2 position and will not damage the tubes. As soon as the switch is thrown to position No. 3 the full regulator action will be obtained and the voltage will drop to normal.

It is believed that one or more of the regulators such as described here will prove a boon to many hams who are cursed with a line in which voltages run high, low or both. It will save tubes heretofore made short-lived by high voltages, improve operation of equipment that has heretofore suffered from subnormal line supply, and will provide a feeling of security which one never has when he must worry constantly about the condition of his lines.

New Acting Chief Signal Officer

THE War Department has announced the approaching retirement of Major General Joseph O. Mauborgne, Chief Signal Officer of the Army, as he reaches the end of his four-year tour of duty as chief of his corps. An acknowledged communications expert and a distinguished inventor and a member of numerous Washington commissions and boards associated with the defense effort, it is regarded as certain that General Mauborgne will continue to loom large in the communications picture at the Capital, although no announcements have yet been made.

Relieving him as Acting Chief Signal Officer, and in all probability due to be appointed the

new chief, is Brigadier General Dawson Olmstead, until recent weeks the Commanding General at Fort Monmouth, commandant of the Signal Corps School and president of the Signal Corps Board.



Brigadier General Dawson Olmstead, U. S. A.

General Dawson was appointed to the U. S. Military Academy from Corry, Pa., in 1902. He graduated from the Academy in 1906, from the Army Signal School in 1909; from the Command & General Staff School, with distinction, in 1924; from the Army War College in 1934.

Prior to World War I, General Olmstead's service was primarily in the Field Artillery, although he served with the Signal Corps by detail as early as 1909, being then engaged in the development of wire equipment for the Field Artillery. During the last war he served in the Office of the Inspector General, A.E.F., and commanded the 50th and 75th Regiments, F.A.

Since the World War he has had a variety of Signal Corps assignments, both in the field and in the Office of the Chief Signal Officer. At the latter he has seen duty as Officer in Charge of the Supply Division, as Executive Officer and, at various times, as Acting Chief Signal Officer for protracted periods. In the field he has been Officer in Charge of the Signal Section, New York General Depot, Division Signal Officer and Department Signal Officer in Hawaii, Officer in Charge of the Alaska Communications System and, more recently, Commanding General at Fort Monmouth.

Strays

In the recent ZCB contest sponsored by the A.A.R.S., W8EBR worked W1SC and W2SC in succession.



U. S. A. CALLING



RADIOLOCATION

ATTENTION, amateur radio operators who are electrical engineers or physicists! The Army and Navy still want you! President George W. Bailey, Chairman of the Radio Section of the Office of Scientific Personnel, has sent out another call for qualified men to apply at once for commissions in the Signal Corps and the Naval Reserve.

The need for trained electronics specialists is great and is growing every day. Candidates are urged to apply for immediate active duty in the armed forces. There is no more vitally important way in which you can serve your country than under one of these commissions. This is an absolutely unique opportunity to be of service and at the same time to learn the operation of secret scientific instruments of new invention in the field of electronics. The knowledge gained from the duties under these commissions will be of inestimable value in later life.

If you have studied physics or electrical engineering in college, and are single and between the ages of 21 and 36, you may be eligible for a commission in the Electronics Battalion of the Signal Corps. Likewise, if you have majored in either physics or electrical engineering, but are married and between the ages of 21 and 44, you may be qualified for a commission in the Naval Reserve involving similar duties. Applicants must be in good health and must have no objection to service outside continental United States.

To those who are qualified, the Signal Corps offers commissions as Second Lieutenant. The Navy gives commissions ranging from Ensign through Lieutenant Commander, depending on age and experience.

If you have been drafted, this will not interfere with your applying for a commission in the Electronics Battalion, provided you are otherwise qualified. The Signal Corps has the authority to transfer you.

Do you know of any licensed radio amateur in the services whose duties do not pertain to radio, who would like to be transferred to other duties where his knowledge and skill could be used to the best advantage?

Tell him to write to the Editor of *QST*, stating his full name, home address, rank, serial number, outfit, location, present duties, and a brief outline of his training and experience. Perhaps something can be done about it, perhaps not. Anyway, it is worth a letter.

Write to Mr. Bailey immediately if you think that you are eligible, or if you wish further information. His address is the National Research Council, 2101 Constitution Avenue, Washington, D. C.

Do not delay. Tell your friends and classmates to-day of this opportunity. If you know of any men who are graduating from college in February, get in touch with them. If you know of any men who have had only three years of college study in physics or electrical engineering, but have had training and experience in the field of radio, tell them also. The Army and Navy's quota of electronics specialists must be filled soon. By helping them, you will be playing an important part in our national defense. Do it now. The time is short!

INSPECTORS OF EQUIPMENT

THROUGH the Civil Service, the War Department is seeking "Junior Inspectors, Signal Corps Equipment," to make inspections and tests of gear to determine compliance with specifications, etc., with duty apparently at the plants of contracting manufacturers. The salary is \$2000 a year, the senior jobs in the same service paying \$2600 and \$3200. Announcement No. 108, unassembled examination. Experience in inspecting is not required, except that an applicant must hold a bachelor's degree in electrical or radio engineering and is permitted to substitute a year of inspectional experience for each year lacking in the required education. U. S. citizens, not over 55, in sound health and capable of performing arduous duties; rigid physical examination. Those interested should request application form from the U. S. Civil Service office at major cities or from the Secretary, Board of U. S. Civil Service Examiners, at any first- or second-class post office.

The Navy is also looking for skilled amateurs who can inspect components and equipment. We do not have exact details but believe the salaries lie between \$1440 and \$2000 a year. There is a good possibility of obtaining work in factories in your immediate area. If interested, write to the Inspector of Navy Material at the address nearest to you in the following list:

22 Marietta Street, Atlanta; c/o Bethlehem Steel, Bethlehem, Pa.; 141 West Jackson Blvd., Chicago; 35 East 7th Street, Cincinnati; 1405 East 6th Street, Cleveland; Detroit Free Press Bldg., Detroit; 983 Main Street, Hartford; 4521 Produce Plaza, Vernon, Calif.; 30 Church Street, New York; 1600 Arch Street, Philadelphia; Smithfield Street, Pittsburgh; 600 Bryant Street,

San Francisco; c/o G. E., Schenectady; Colman Building, Seattle.

INDUSTRIAL SPECIALISTS

THE Civil Service announces the continuance of the search for Industrial Specialists, including men with experience in radio and other electrical equipment, supplies and apparatus. Salaries range from \$2600 to \$5600 in the various grades. No written examination. Application forms from Civil Service representatives at almost any post office or at a Civil Service district office. Mention Industrial Specialists, Announcement No. 102.



IN October, 1916, *QST* for the first time sports a two-color cover. It is now a respectable-looking magazine, well out of its swaddling clothes. Tuska and Maxim have incorporated the *QST* Publishing Company, Inc., and this is the first number under the new name.

There is much interest in new and improved apparatus. A. H. Grebe describes his beautiful station, equipped for both telegraph and 'phone, and the editor says it is one of the most distinguished amateur stations in the country. Paul Godley's circuit articles have borne fruit, and this issue contains the first Grebe ad, offering a regenerative tuner covering 150-400 meters, which Mesco asserts will increase the receiving range of any ordinary station by a hundred times. The device consists of a tuner only, no tube equipment, and the price is \$32.50. DeForest has brought out a $\frac{1}{4}$ -kw. "Oscillon" or c.w. transmitter, the first of its kind that has been mentioned in *QST*. It is being tested out at Maxim's station, 1ZM, on 600 meters and reports are sought. It has a single triode with 800 volts on the plate and a small cooling fan under the tube. The editor commends c.w. transmission but wonders, "How are we going to get started on this undamped-wave business? If an ordinary spark station decides to install undamped apparatus, he shuts himself off from those stations with whom he has been working but who still have the regular spark system. The only way would seem to be for a lot of us to jump in at the same time." Further technical curiosity is displayed in the choice of the leading article, "Some Small D.C. Sets," by Bowden Washington, reprinted from the *IRE*, dealing with impact-excitation transmitters designed for airplanes and employing a Chaffee gap (copper and aluminum in a hydrogen vapor). And meanwhile the argument of high note versus low note rages furiously.

The Old Man crashes through with an article

on "Rotten Construction," but he is still not regarded as a humorist; he is simply doing some serious talking in an interesting vein. Charles S. Wolfe is becoming *QST*'s star humorist and his "Liars" is a tidy piece. He says that "when 'Guggy' Marconi wormed the first grant out of the British Post Office folks, he laid the foundation on which has arisen one of the finest and most spectacular body of liars this old planet has ever seen."

WWV Schedules

IMMEDIATELY after the standard frequency station WWV of the National Bureau of Standards was destroyed by fire November 6th last, a temporary transmitter was established in another building and partial service was begun. The service has now been extended, although still with temporary equipment. It is on the air continuously at all times, day and night, and carries the standard musical pitch and other features. The radio frequency is 5 megacycles per second.

The standard musical pitch carried by the broadcast is the frequency 440 cycles per second, corresponding to *A* above middle *C*. In addition there is a pulse every second, heard as a faint tick each second when listening to the 440 cycles. The pulse lasts 0.005 second, and provides an accurate time interval for purposes of physical measurements.

The 440-cycle tone is interrupted every five minutes for one minute in order to give the station announcement and to provide an interval for the checking of radio measurements based on the standard radio frequency. The announcement is the call letters (WWV) in telegraphic code.

The accuracy of the 5-megacycle frequency, and of the 440-cycle standard pitch as transmitted, is better than a part in 10,000,000. The time interval marked by the pulse every second is accurate to 0.000,01 second. The 1-minute, 4-minute, and 5-minute intervals marked by the beginning and ending of the announcement periods are accurate to a part in 10,000,000. The beginnings of the announcement periods are so synchronized with the basic time service of the U. S. Naval Observatory that they mark accurately the hour and the successive 5-minute periods; this adjustment does not have the extreme accuracy of the time intervals, but is within a small fraction of a second.

Strays

All amateurs who are also dentists and who plan to attend the eighty-third annual meeting of the American Dental Association in Houston, Texas, on October 27th to 31st are requested to write Dr. A. D. Uhls, W9RGV, 258 Plaza Bank Bldg., Kansas City, Mo.



Above — Verna St. Louis, K7HUT, lives in a village where there is but one other white woman.

YLRL, QRV!

BY ANITA BIEN.*
WBSTAY

“**QRV!** (I AM READY!)” stamps that new race of women comprising the Young Ladies Radio League. The “Q” signal was recently adopted as their motto, and practical demonstrations that they *are* ready daily unfold before the eyes of the world.

They called it the “YLRL” when it was organized almost two years ago. Ethel Smith, W7FWB, the first president, visioned the organization but little dreamed that it would turn out to be such a successful idea. With a small band of pioneers, the wheels were set in motion.

Now nearly 250 strong, the YLRL boasts members from the Atlantic shores to the western waters and from the Bering Sea to the Caribbean. Alaska, Hawaii, Puerto Rico, Canada, England and 43 states of the Union are included in the roster.

Like their brothers of the airways, the girls of the YLRL regard their amateur radio as a means for public service.

YL's Serve in Emergencies

When emergency impends they are ready. Letha Allendorf, W9OUD, SCM of Missouri, was nicely settled to snag a VU in an African DX contest when she heard an urgent call from

*13 Wiltshire Road, Moreland Hills, Route 3, Chagrin Falls, Ohio.

ARRL. The big flood of the Mississippi was raging. What mattered the needed ZU QSO compared to bringing relief or comfort to a grief-stricken parent or emergency supplies to the refugee camps harboring hysterical flood victims? That's the privilege of “hamming” and the adventure behind amateur radio operating. The unpredictable elements demand constant preparedness for any emergency. Whether it is an earthquake in California, a hurricane in Connecticut, forest fires or relentless flood waters, each girl, like her brother ham, is willing and ready to do her share.

“Worst ice storm in Texas history” flashed out an Amarillo amateur's message to the world last November. The streets became clogged with twisted wires. Among those who braced to urgency's call was Louise Lacy, W5IKC, 5th District YLRL chairman. Excited and tired, Lou carried on, bringing aid to isolated, wreckage-filled Amarillo.

During that same devastating sleet storm which disrupted wire facilities in Michigan, Minnesota and the Texas Panhandle, many women assisted in relaying urgent telegrams which otherwise would have suffered serious delay. Among the most active was Caroline Schisler, W9EVT. Western Union later honored her with a Public Service award.

Naturally, the YL's prefer to be couriers of good tidings, but if forced to relay tragic words



YL's at the Hamfester's picnic in Chicago, 1940. Left to right: Lucille Neudling, W9HTR; Carrie Jones, W9ILH; Ethel Sando, W9QV; Esther Davis, W9EFW; Ella Weichmann, W9UPF; Elvera Dressler, W9TLJ; Julia Morgan W9LRT; Carol Keating, W9WWP, and Edna Cummings, W9IKS.

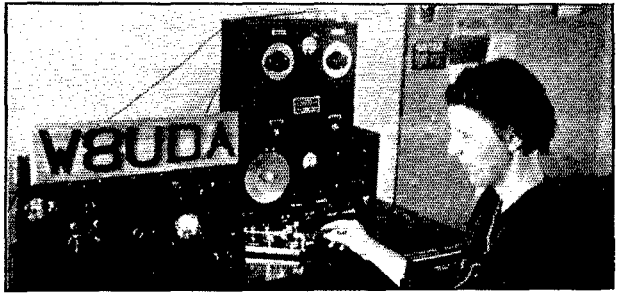
to a heart wrung with sadness they do so with the same expediency.

And always they are preparing themselves — ready. Charlotte McCaffrey, W2NSL, Ruth Beckwith, W8ODI, Marjorie Allen, W2NRC, and dozens of others are training themselves in high-speed code. Margie Frazier, W7GXI, belongs to five emergency nets. Should a crisis arise, these girls are ready and willing to do their bit.

Ethel Fraser, W1MRC, with her OM, W1IM, recently staged a demonstration of amateur radio for the city and police officials of Bridgeport. She took a 2½-meter transceiver up in a plane and talked to the mayor and other city officials. As a result of their success the local police department began organizing a nation-wide network of amateur stations to cooperate with the Police Chiefs' Association of America, and the Frasers have been asked to visit other states to put on similar demonstrations. Ellen Hastings, W1KUI, works in the Connecticut State Police u.h.f. net, a state-wide system providing every State Police barracks with emergency communication.

Kay Kibling, W2HXQ, has figured in various humanitarian activities. In one of her unforgettable "watches" she maintained constant communication with Millinocket, Maine, when 13-year-old Donn Fendler was lost on Mt. Katahdin for 9 days. Kay has generously arranged special programs featuring numerous YLRL girls over WNYC. She also saw to it that the girl leaguers had a special QSL display at the Century of Progress station, W2USA, of which she was secretary and station trustee.

It was Verence Bailey's transmitter at W4DOE that was the voice of W4USA on 10 meters at the Mid-South Fair. A group of Dixie



The YL's are proud of Dot Willett, W8UDA. Although blind, she is a faultless c.w. op (works 'phone, too). She wrote lyrics for the YLRL song, is a teacher of Braille in Flint, Mich.

hams with Verence organized a radio club which dramatized programs over station WMC to educate the public to amateur services. Then they crusaded for old radio sets to be renewed for crippled and needy individuals. The kind-hearted citizens of Memphis generously responded, and last Christmas was brighter because of the helpful ham spirit.

Many of the YLRL have displayed valor in the serving of mankind, country and community. This varied outline is merely an attempt to present the new type of vigilante action, with no intent to glorify one girl's capabilities above another equally deserving.

Romance in the Air

Not that it's all serious work in line of duty for YLRL members. There's fun and romance, too.

Romance — it's "in the air," and it happens in all districts. "Radio mergers" in the ham ranks are on the increase. Someone once referred to CQ as the "mating call" of the amateur. Certainly it has brought mates to a few in the YLRL.

Lois Matson, W4FGR, possibly Alabama's



YLRL Unit No. 4 — New York City. Organized by W2NAZ, this is the newest local group to be formed. Standing, left to right: Carolyn Anita King, W2NGO; Vi Grossman, W2JZX; Eleanore McGovern, W2MWY; Marjorie Allen, W2NRC. Seated: Leonore Conu, W2NAZ; Marge Fischer, W2NAI; Violet Farmer, W2NIN; Wilhelmina Grabner, W2MEG.



K6ROJ

W9WWP

W9FIK/4

W9RNO

Ella Christensen, K6ROJ, the first Hawaiian member of YLRL, is outstanding in DX work. Carol Keating, W9WWP, was first vice-president until senior year work at the U. of Ill. interfered. An expert traffic handler, Agnes Cooley, W9FIK/4 handled 700 messages during a 3-month maneuver for the men stationed at Fort Benning (Ga.). Like W1FTJ and W9JTX, Ada L. G. Northrop, W9RNO, is now a "Navy widow."

first licensed YL, wanted to be an old maid, according to the 4th District chairman, Helen Davy, W4GFO. "Fate had different plans for her, however," Helen continues. "Lois started having skeds with James McKinstry at K5AT in the Canal Zone. Now she's Mrs. McKinstry!"

Formerly a chief surgical nurse, Lola Lippelman, W4FJR, became interested in radio through the efforts of W4ECT. He "sold her" not only his hobby but himself, as well. Lola is a good traffic-handler and in one month recently handled a total of 2548. Helen Pallme, W9WVX, also met her OM, W9KOA, "on the air."

The "ham lingo" intrigued Alice Stewart, W9GOJ, when she first got a 5-tube set and "snooped" on the 160-meter 'phone hams in and around St. Louis. "How can I become a ham?" she wrote W9WQY, who invited the family over and let her call CQ. She was bait for W9WOS, who continued the good-deed program. When he invited her to visit the station she armed herself with parents and a spice cake whereon his call letters were spelled out in pecans. He undertook to teach her amateur radio, and dates followed naturally. Soon "Rusty" was encouraging Alice-May with the words: "No amateur license — no marriage license." Incentive aroused, both licenses followed.

Peggy, the travelling 6th District chairman,

got her first license when 13 years old. She dropped it for a time, becoming an NBC actress. There was an engineer at NBC who was also a ham, and . . . Now, while she has several rigs on the air, she's valiantly plugging for WAS with a tiny 2-watter. Genevieve Capstaff, formerly W2CMK and now W6GRX, also married her instructor, W2CDQ — another NBC engineer.

Organizer of the latest local YLRL unit in New York City is another YLRL leaguer with still another NBC romance — Lenore Kingston Conn. W2NAZ, ex-W9CHD and former 9th District chairman. A popular network radio actress in Chicago, when she married W2MSC she came to New York and continued with NBC. She and Ann McGovern, W2MWY and ex-W5IRS, are busily engaged in volunteer code teaching to a group of women defense trainees intent on also becoming YLRL'ers.

W8TUQ's name was Irene Gedney when she was staff pianist at WHAM, but then she met W8DOD who was control operator at the same station and now the last name is Gabb. Both are active in the Rochester Amateur Radio Association but took time off not so long ago to enjoy a California honeymoon.

Then there's pretty Mickey Helland Marglin, whose temporary retirement from the amateur radio field had them all guessing. Mickey won



VE2HI

W7COX

VE4APA

W1NJJ

"Schoolmarm" Ethel Pick, VE2HI, who caught the radio fever from her Mapleleaf Signal Corps brother, is now patriotically caring for English guest children. Fran Viers, W7COX, moved from Montana to (of all places) Grand Island, Nebr. The OM was in the picture with Maude Phillips, VE4APA, but this being strictly a YL story we chopped him off. Eunice Loyzim, W1NJJ, got interested when her OM, W1BEQ, played an important part in 1936 flood emergency work.



W9OUD

W2NAZ

W3CDQ

W9ZTU

The happy girl at the left is hard-working Letha Allendorf, W9OUD, ARRL SCM for Missouri, AARS, SNCS and 9th District YLRL chairman. Lenore Kingston Conn, W2NAZ, is a popular NBC radio actress as well as an enthusiastic amateur. Elizabeth M. Zandonini, W3CDQ, abstracts radio literature in 5 languages and does laboratory work at the Bureau of Standards. Mickey Holland Marglin, W9ZTU, was the first woman operator to work in an official War Department circuit pounding brass 8 hours per day.

recognition as the second op at W9ZTU, scheduling several cavalry divisions. No less than 734 messages zipped from her key in 24 days. BPL listing followed. Her hobby paid her dividends, for she was offered a job in the War Department's radio station WTY. One day Mickey paid a visit to a hospital to see a girl friend and stopped by to visit Sgt. Jimmie, the operator of W9THS. He was confined with a badly-mangled thumb, the result of an accident while on a tank-radio detail. On his release he began helping her toward her commercial. Now she's singing his praises both as an operator and as her husband. They chose Florida for a honeymoon. Left without a call but the possessor of a 300-watt rig, Mickey will be back on the bands soon.

Dot Knapp, W2MIY, also accepted a position in the War Department. The only AARS woman Radio Aide, she was active in the Eastern New York district. Vi Grossman, 2nd C. A. staff artist and editor of "Scarab," has said: "Don't blame the boys if they would DASH after DOT for DOT has DASH!" Vi's own hectic years of activity and organization under the call W2JZX have rendered the Army meritorious service. She was runner-up for the 1938 Paley Award as the result of her outstanding emergency work.

Other YLRLeaguers in the AARS net of the

2nd Corps Area are Margaret Fischer, W2NAI, Clara Reger, W8KYR, Lenore Conn, W2NAZ, and Ann McGovern, W2MWY.

They're in the Army, Too

Many of the YLRLeaguers are represented in other Corps Areas in various capacities. In fact, the girls are in the Army in a big way. Bea Austin, W7HHH, Mabel Fewkes, W6OEJ, Theresa Pessoney, W5GXT, Letha Allendorf, W9OUD, Alice Bourke, W9DXX, and Enid Carter, W9NBX, are among those receiving AARS instruction in cryptography — a valuable asset in the national emergency, for cryptographic clerks are not trained overnight. Nellie Hart, W7NH, was the first and only overseas op for the AARS. A signal honor for a Signal Gal! She later gave up this position and turned Radio Aide counsellor after being DNC and ASNC for a period of about four years.

One of the Army YL's started a private war, although her name's not Helen. She's a red-head and has green eyes, but her name is Gladys — Gladys Nichols, W8SJE. A bear for punishment when it comes to traffic, she is helping the Army group keep its reputation as darned good fighters. Living in Ohio you would think she belonged to that state, but no — Indiana claims her. One of



W9NBX

W9DBD

W7NH

W1BDN

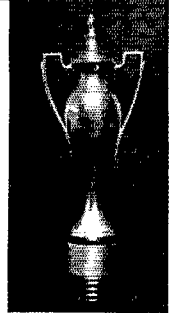
President Enid Carter, W9NBX, was YLRL's first secretary-treasurer and editor-publisher of "YL Harmonics." Her place is now filled by Leta Bush, W9DBD, product of Indiana University and organizer of the third YLRL local unit in Greater St. Louis. Nellie Hart, W7NH-WLYI, has been AARS overseas station, and is now Radio Aide Counsellor. May Smith, W1BDN, one of the "Manchester Tower Smiths" has been an active amateur for more than twenty years.



← (1) Mildred Wildman, W8PZA, at present chairman of the 8th District unit, organized the 8th District YLRL net. (2) Louise Fewkes, W6OEJ, is a cryptographer and is interested in the Woman's Air Reserve. (3) Vice-President Marie Corcoran, W8TPZ, is NCS of the 160-meter net of YL's from Maine to Florida. (4) Ruth Brown, W5IZL, an A-1 operator and traffic-handler, lives in Electra, Tex., near the site used as a setting for the movie "Boom Town." (5) Helen Davy, W4GFO, regularly makes the BPL; she is also 4th District YLRL chairman. (6) Beatrice Austin, W7HHH, 7th District chairman and wife of Oregon's SCM, is another cryptographer. (7) Mary LeVan, W3FXZ, former 3rd District chairman, is an expert AARS girl; she works DX, too. (8) The author herself — Anita Calcagni Bien, W8TAY, organizer of the No. 1 YLRL Unit in Greater Cleveland and publicity chairman of the organization since its inception. (9) Lida King, W1GQT, capable 1st District chairman, is an expert operator and emphasizes emergency preparedness. (10) Ethel Fraser, W1MRC, not only operates on 2½ but actively plugs ham radio to municipal and police officials.



Dot Evans, W1FTJ, SCM of New Hampshire and expert contest worker, had a radio store with hubby Lt. Carl Evans, but he's on active duty in the Navy so she operates the "CQ Kennels" now. Won the coveted "Corcoran cup" at right by coping top place in first YLRL Anniversary Contest. Also won 1940 SS in N. H.



her staunch Indiana supporters has threatened to write a book for the edification of the Buckeyes on "How to Keep Your Women."

Some of the YL's have even seen actual service. Elizabeth Zandoninni, W3CDQ, a radio aide at the Bureau of Standards, is a former radio school instructress who taught radio in army camps to soldiers who were to be rehabilitated after their hospital release. She wore a nifty uniform as a member of the Women's Radio Corps and had a rating of Second Lieutenant in the U. S. Signal Corps. Now she is an Assistant Director of ARRL, and holds a commercial ticket.

Elizabeth and that top-ranking cipher buster, Frances Rice, W3AKB, did some creditable operating in connection with the recent American Red Cross test. The message was sent from Philadelphia to Red Cross Hq. in Washington where W3CDQ, operating an emergency-powered rig, speedily returned a reply. Needless to say, both city and Red Cross officials were impressed, and that's what makes amateur radio count. Fran's record in the latest army code contest was 45 w.p.m., by the way.

Speaking of operating ability, a number of YL's have built up outstanding records of accomplishment in this field. Among them is the president of the YLRL, Enid Carter, W9NBX. Ambition and intense application to study quickly saw her hurdle the gap from Class C to Class A (the same day taking her 3rd class radiotelephone). About the same time she passed her cryptographic exam. Skeds on the ARRL, FTS,

(Continued on page 78)

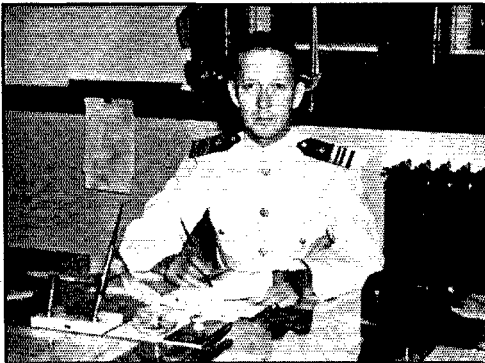


YLRL Unit No. 3 — Greater St. Louis. Organized by W9DBD, they made history as the only all-YL group in the 1941 ARRL Field Day. Left to right: Louise Baker, W9JTX; Alice-May Stewart, W9GOJ; Virginia Fisher, W9ZIH; Janie Ownbey, W9LUM; Helen Pallme, W9WVX; Joanna Barnes, W9JWJ; Helen Thompson, W9JPT; Marie Van Aller, W9PFO, and Carrie Jones, W9ILH. (W9ONW and W9DBD not in picture.)

IN THE SERVICES

AIR CORPS

SCOTT FIELD must be about the easiest location in the world from which to get answers to CQ's, judging by the number of hams who are or have been there. This month we find Trbovich, 8VKD; Whitener, 5ITX; Huffcutt, 9ULB; Pribyl, 9OMC; Lynch, 8VSC; Davidson, 9LCB; Miller, 4CWB; McDonnell, 9JPL; Drees, 9IYM; Riley, 5HFM, and Coggin, 9SHN, attending the Air Corps school for training of radio operators and mechanics. More of the gang in the Air Corps include Capt. Gardenhire, 7ATC, 17th Bomb. Gp., McChord Field, Wash.; Capt. Martin, 3JDI, and Staff Sgt. Michael, 3EOG, Middletown, Pa., Air Depot; Sgt. Norris, 4H DU, 105th Obs. Sqdn., Birmingham, Ala.; and Capt. MacKellar, K6OWJ, 5th Bomb. Gp., Hickam Field, Hawaii; Pvts. Toole, 9NZK, and Lang, 8FYF, operate point-to-point nets from Langley Field, Va. Pvt. Willburn, 9IGE, has been assigned to the 37th Bomb. Sqdn., Lowry Field, Colo. A bit farther west is Pvt. Faries, 60OU, with the 42nd Bomb. Gp. at Ft. Douglas, Utah.



The Navy apparently cannot get along without Lt.-Comdr. Fred H. Schnell, W9UZ, who has been called to active duty as Ninth Naval District Communications Officer — the first time a reservist ever held that important post, supervising all communications in the thirteen midwestern states comprising the largest naval district. Schnell's naval experience began during World War I; he handled the armistice messages of that war in the Navy control room at Washington and was chief on the *George Washington* on her two trips taking President Wilson to and from Europe. After the war he first was ARRL's city manager for Chicago and then, from 1920 to 1926, communications manager of the League at Hartford. As IMO he pioneered amateur two-way transatlantic communication, a job which in 1925 resulted in the Navy calling him back (on leave from the League) to accompany the fleet on its cruise to Australia, to demonstrate with NRRL the value of short waves to the Navy. At present he is on leave of absence as chief of Chicago's police radio system.

Cpl. Pavlinko, 3JCY, maintains radio equipment of the 22nd Pursuit Sqdn. at Ponce, P. R., while at Borinquen Field we find Staff Sgt. Lentz, 3EZH, and Pvt. Wolff, 9CRK. Pvt. Eavey is getting 9HAI modified to Chanute Field, Ill., for hams of the 10th Air Base Gp. Raoul Escallier, 6LST, has distinction of working aboard the world's largest warplane, the Army's B-19. Pvt. Price, 9NFY, at Wheeler Field, Hawaii, awaits an opportunity to pound brass in a flying fortress. Pvt. Reinhardt, 3IIX, monitors airway channels at Mitchel Field, N. Y. Brooks, 4EDJ, is a flying cadet at Chanute Field, Ill. How we hams do get around!

NAVY

LT. BEST, 1BIG and a former New England Division director, is in communications at the new naval operating base at Bermuda. Lt. Biele, 2AOS, is on duty in the D.C.O.'s office, Philadelphia. Ens. Dausman, 5ELR, has duties as radio material officer, 8th Naval District, New Orleans, and Lt. (jg) Goldsmith, 5CSL, has similar work at Corpus Christi, Texas, where Ens. Lamb, 1EMH, is coding officer. Lt. (jg) MacGregor, 8VKV, is an inspector of radio material in the Navy's Chicago office. Lt. (jg) Dana, 4AGR, is Asst. D.C.O. of the Key West, Fla., naval station. Lt. (jg) Hudgins, 6CIW, holds the position of Asst. C.O. at the San Diego naval air station. Lt. Pickard, 2ADL, is assigned to the Pensacola, Fla., air station. Communications officer of the *Paducah* is Lt. (jg) Walker, 9KNR. Ens. Olver, 6SXX, is third mate aboard the *Flying Cloud*. Ens. Hummel, 8MOT, has an assignment as Asst. C.O. of the Inshore Patrol, Cape May, N. J.

Normally aboard the *Paducah*: RM1C Burch, 9WKJ; RM3C Armstrong, 9UQP; Noll, 2HSR, and Chinelli, SWCQ, when ashore operate in a 2½-meter net! RM3C Schuele, 7DXL; Lynch, 7FOV, and Fowler, 7ILM, are with the fleet in the Islands. RM3C Terry, ex-7BFC, is aboard the *Dent*, San Diego. In training at Indianapolis are S2C Brown, 5LBC; RM3C Skillington, 6BDB; Delaney, 6DFB, and Towler, 5BYV. RM1C Roberson, 4BBS, trains at Key West, Fla. RM3C Naugle, 9QIH, aboard the *Astoria*, and Freitas, 6OLA, on the *Parrakeet*, have visual and radio communications duties. CRM on the *Saratoga* is Collins, 8QN. RM2C Horton, 9IGX, is assigned to the Norfolk air station. At Floyd Bennett Field, N. Y., on operating watches are: CRM Kroger, 2ALL; RM2C Meyer, 3EQF;

LaManna, 2IHPE; RM3C Ellis, 2LYG, and Spieker, 2KTJ. On radio materiel maintenance there are: CRM Tarditi, 2BPV, and Cabanillas, 2BNJ. Gunner Martin, 6STT, is with the Marine Corps at Quantico, Va. Among hams on the aircraft carrier *Enterprise* are RM3C Barker, 9VEH; Calhoun, 9NAF; Mochring, 2MSU, and Smith, 2LFL. S1C Cartmill, 1LHY, operates at the Quonset Pt., R. I., air station. Former North Texas SCM Hughes, 5DXA, is now pounding brass on the *Wasp*. RM3C Bergner, 9TNU, is aboard the *Chicago*. RM2C Briggs, 2NUC, is stationed at the Naval operating base, Norfolk. The Syracuse, N. Y., NCR unit is proud of the following contributions to Navy communications work: Lt. (jg) Hale, 8EZ, at the radio station in San Juan, P. R., with White, 8MGT; Steinbach, 8APX, on the *Denebola*; Schmitt, 8ABV, on the *Tuscaloosa*; Barnes, 8SZG, and Book, 8LOY, at Floyd Bennett Field, N. Y.; and Freeman, ex-8MEY, on the *Upshur*.

Maybe we're wrong about the most QRM being at Scott Field; look at this list of hams who in July began a four months' communications course at the Naval Reserve Radio School, Noroton Heights, Conn.:

Seamen Zakarevics, 8VTM; Tietz, 9MRU; Leaf, 8UDP; Paski, 8VGX; Klimek, 9ORL; Spang, 9UUR; Schaefer, 9WFG; Vasen, 9KDY; Archibald, 1NBP; Heidelberg, 5AEU; Kelly, 4GOP; Zynel, 8NOW; Berent, 9VLG; Paulisse, 8RYF; Frykman, 9HZK; Hurt, 9RGI; Rose, 2KMB; Tillman, 4FEO; Zahuranec, 8ULQ; Sieth, 9HTV; Haggart, 9BGP; DeFries, 9YYP; Uphaus, 8WAM; Ellsworth, 4ERK; Raske, 3GZM; Mosher, 1LTH; Fraser, 1KCS; Brown, 9EPV; Shaw, 1NEU; Rueger, 2JFB; Blake, 2CCI; Diehn, 8MJG; Bietsch, 3FQF; Rubens, 9MPE; McCaskell, 9NJT; Rogers, 1LJH; Saunders, 1LXZ; Davison, 1FWQ; Sielski, 2LBQ; Zider, 2HPG; Lipski, 1MAU; Wernick, 2JMN; Lazear, 3GXN; Voorhees, 2EWM; DeGeorge, 2MPN; Jashnoff, 2KUP; Rosenberg, 2GSC; Sawinski, 1LOL; Fielding, 1KUC; Pfister, 9IZQ; Purkey, 9LRX; Hano, 2NFT; Stotts, 7HZO; Adamski, 1IAI; Delany, 2NRK; McGraw, 8NEC; Roberts, 9IGS; Snelling, 9PHZ; Gochring,

2FVV; Robinson, 9PEE; Murphy, 2HWC; Chaikin, 2FLL; Haas, 2JXM; Harris, 2NDI; Ehlinger, 2JNV; Terchek, 9TEG; Skuble, 9TEQ; Morgan, 9MRS, and Kaminski, 1NEH.

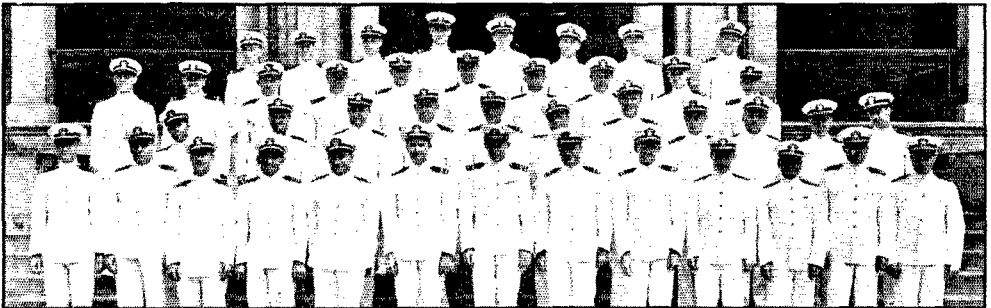
And an equally large group taking a brief "refresher course" at the same school: CRMs Van Dyke, 3ELI; Massey, 5DLM; Hartzell, 8HPC; Grove, 2BZJ; Karrmann, 1DBW; Jenkins, 8GWY; Fowley, 9CRY; Bear, 1ASP; Cimildoro, 8BCN and Larson, 8BPJ. RM1Cs Arrighi, 5AXS; Pfister, 8FJW; Dmitruk, 9NUN; Barlow, 1CEJ/2OAY; Martin, 3JJI; Fortelka, 9AGQ and Gould, 5GQC. RM2Cs Christensen, 9TVA; Tillotson, 5JVI; Vail, 2OH; Holzmilller, 8GFB; Childers, 9ZHD; Stewart, 5FYI; Palmer, 9BQM; Fearon, 1KYT; Zember, 3GWY; Mason, 3FVD; Parten, 8BWC; Hollowell, 1DNP; Irving, 1BFR; Lorentson, 3GSD; Cothran, 4EBK; Hubbard, 1KAH; Unsworth, 1GBK and Freeman, 5BCF. RM3Cs Twohig, 9MJZ; Mavropoulos, 8QKH; Held, 1KUH; Moresco, 9LJX; Ballard, 4LXT; Bond, 5IDN; Dillman, 1DDX; McClanahan, 5GUQ; Miller, 5GMB; Pope, 5HWF; Silverling, 8PWI; Geltz, 8OEF; Hamer, 9TWB; Lewis, 9HEV; Sims, 8RZZ; McLeery, 9NOH; Soltow, 9BIW; Dorman, 9PRD; Dawson, 8ODM; Dickson, 5FKR; Conn, 3EUX; Hepler, 8KPU; McConaghy, 3CNI; Johnson, 1JZK; Frye, 2HJE; Vanderbeek, 3GQM; Tyndall, 8KJY; Boynton, 1KUS; Gully, 3HSH; Greatbatch, 8QBD and Gunsel, 8UDC.

LICENSE RENEWALS

As a matter of general interest, we here reply to an inquiry of Pvt. Barnes, 4FZH (Camp Blanding, Fla.) about renewal of amateur licenses by those in the services. You fellows find it difficult to comply with the formal FCC requirements for obtaining blanks, etc., so to make it easier the Commission has adopted its Order No. 81 (reproduced in August *QST*, p. 28) which in brief allows a renewal application by a service amateur to take the form of an informal letter to the FCC; the only proviso is that the letter of application must state, and be corroborated by a superior officer, that the applicant is actually in military service. Of course, you already know that it is temporarily not necessary to show proof of activity (three stations worked) in connection with renewals.

NON-MILITARY

Nor in uniform but just as important to defense preparations are a group of hams doing design, development and initial testing work in the radio division of the Naval Research Laboratory. Roger Wilson, 3JHV-8JTT, sends us the names of Williams, 1HJE; Deutsch, 1LGJ; Herring, 3AJL; Hensell, 3AOC; Duncan, 3ASH; Speakman, 3AUR; Boyd, 3COK; Gordon, 3EBK; McClenon, 3EIS; Long,



The value of amateur radio in providing a quick source of qualified communication personnel for Uncle Sam's fighting forces during time of national emergency is exemplified in this group of NCR officers called to active duty last April. They have just finished a special communications course at the U. S. Naval Academy postgraduate school, W3TG. Standing, 1. to r., front row — Lts. (jg) Chace, 6BBW, Machen, Perkins, Moser, Berry, Lt. Comdrs. Jenkins, Evans, MacDonald, Willis (instructors), Lts. (jg) Fuld, ex-2BEG, Rosenthal, 2QU, Loyall, Cheche, 3HZJ. Second row — Ensigns Brewer, 9JFD, McClelland, 9HFC, Davies, 7EHO, Davis, Fox, K6GNY, Jones, 50J, Kroeger, Post, K7IFZ, Wood, 8AOZ, Kummerow, Henderson. Third row — Ensigns Martin, 3GDR, Rooney, 2KVP, Millsap, Hollis, 4AFC, Krause, Rhodemyre, 8VWJ, Bruning, 3EZ, Vance, Wambganss, 2LRO, Bernard, 4ELZ. Rear row — Ensigns Frazee, 9WDD, Daniel, 4DUC, von Dohlen, 4HC, Morrin, Mattoon, Knowlton, 1ATE, McCrudden, Russell, 6PN. Amateurs not in the picture are Ensign van Groos, 6GFY, and Lt. Comdr. (instructor) Giet, 3EUO.

3EIV; Mackenzie, 3EJU; Oertel, 3ESO; Dulin, 3ETT; Herman, 3EUJ; Koontz, 3EDG; Herman, 3FGD; Melton, 3FNG; Montgomery, 3FQB; Price, 3FYJ; Page, 3HCZ; Bush, 3HJB; Riccobono, 3HPQ-2TI; Bourland, 3HRQ; McCabe, 3HUD; McCoy, 3HYS; McVay, 3IKK; Jones, 3IOS; Chambers, 3IVE; Huntley, 3JAP; Liebson, 3JDH; Stoops, 3JDS; Bliss, 3IFO-1FMZ; Blake, 3JIH-5FFZ; Hodges, 3JDG; Taylor, 3JLK-8NEL; Mengle, 3JME-8CL; Peck, 3RL; Faust, 5EHQ; Weimer, 8AFX; Dinger, 8KG; Ramp, 9SKH, 3JKO and 8BJL.

Among the Gallups Island school group of students starting in July to acquire commercial operator licenses, there is a gang of hams mostly "recruited" by *QST*'s story on the school. They are: Randall, 1KVP; Dunham, 1LCA; Peduto, 1MKL; Porter, 1MVM; Burns, 1NDE; Veeder, 1NLQ; Bjornsen, 2JAU; Freedman, 2KCZ; Marsh, 2KTR; Vleschouwer, 2MEM; Baker, 2MUH; Warner, 2NJO; Pauer, 2NYW; Smith, 3HDI; Stumpo, 3IFU; Barnes, 3JHS; Brejniak, 3JJE; Galloway, 3JOR; Waldrop, 4HAC; Henderson, 5JEM; Proctor, 5JIK; Hicks, 5JRN; Paisley, 6RNT; Olson, 6RWQ; Barnes, 6UAX; Seiss, 7HLL; Soper, 7IJZ; Schenck, 8RGL; Bouchard, 8SCY; Wallander, 8TWP; Stevens, 8VWN; Hall, 8WAE; Soper, 9CPL; Teegarden, 9FSI; Quinn, 9GZZ; Doil, 9HSA, Meyer, 9ITH; Buckles, 9JUN; Gussman, 9MDB; Ricker, 9MUQ; Hane, 9MYR; Clough, 9OMU; Lee, 9PBW; Tomlin, 9ULO, and Bellman, 9VQE.

ARMY, General

CONGRATULATIONS to League Director Caveness, 4DW, promoted to the rank of Major, Staff Sgt. Tarking-

ton, 4HRS, is radio chief of the 181st F.A., Camp Forrest, Tenn. Pvts. Mitchel, 9JJA; McCutchan, 9MOK; Northam, 5KAM, and Bethge, 9UUU, are among the gang at Camp Shelby, Miss., reporting airplane observation of battery firing. Selectee Pvt. Kay, W9WDB, is a student radio op of the 55th F.A., Camp Roberts, Cal. Lt. Lynch, 7HVK, has reported for duty at Dutch Harbor, Alaska. Lt. Mack, 8HAN, is assigned to the 460th Ordnance Co., Ellington Field, Texas. Sgt. Chiuchiolo, 2LWB, plans to set up a trainee traffic station at Ft. Benning, Ga. Pvt. Scoville, 8UXD, has 4HSI in operation at Ft. Jackson, S. C. Pvt. Martin, 5IYD, enjoys his specialist training at Ft. Bragg, N. C. One of the ops at WUU, Ft. Adams, R. I., is Pvt. Myers, 1HEN.

The staff of the 109th Engineers, Camp Claiborne, La., includes Lts. Fite, 9SWV; Nelson, 9YJX; Sgts. Coates, 9APT; Egge, 9TZJ; Cpl. Zambo, 9ANW, and Pvt. Wright, 9QJJ, all from South Dakota. In the 43rd Division at Camp Blanding, Fla., we find Capt. Rounds, 1LOZ; Tech. Sgt. Fields, 1LTM, and Pvt. Sorutum, 1LPA, of the 103rd Inf. Hq. Co.; Staff Sgt. Fontaine, 1KSR, and Pfc. Abbott, 1KCO, of the 86th Inf. Brigade; Tech. Sgt. Manley, 1BCK; Staff Sgt. Hope, 1KOO; Sgt. Buxton, 1KVY, and Pfc. Stevenson, 1CUN, of the 172nd Inf. Hq. Co.; Sgt. Hanson, 1NAM, of the 102nd Inf.; Pfc. Lindscott, 1LIC, of the 68th F.A. Hq. Btry.; Capt. Hertz, 1FQ; Mstr. Sgt. Delahunt, 1CEM; Staff Sgt. Hatch, 1AWY; Pfos. Kenney, 1LEV, and LaForge, 1MLX, of the 152nd F.A.; Staff Sgt. Tetreault, 1KZN, of the 103rd F.A.; and Staff Sgt. Root, 1IFY, of the 192nd F.A.

Lt. Hunt, 5TG-CCU, is radio officer of Ellington Field, Texas, where also is stationed Capt. Borden, 5DOC, Cal. (Continued on page 80)

Navy Day Receiving Competition

To Be Held on October 27th

A MESSAGE to radio amateurs from the Secretary of the Navy will be transmitted on Navy Day, October 27th. In connection with this message A.R.R.L. will conduct the Seventeenth Annual Navy Day Receiving Competition. All amateurs are invited to take part in this activity, which constitutes amateur radio's participation in the celebration of Navy Day.

Two messages will be transmitted, one from Radio Washington (NAA), the other from Radio San Francisco (NPG). These messages will be substantially the same in thought but will vary slightly in wording. A letter of appreciation from the Navy Department will be sent to *every amateur* who makes perfect copy of the text of one message. Should characters for any reason be transmitted with improper spacing such as from tape-punching errors, words containing such characters will not be counted in the grading of papers. Both messages may be copied, but only the best copy should be submitted in the competition. It is not necessary to copy both stations, and no extra credit is given for so doing. However, if both stations should be copied, please mention the fact when submitting your *best* copy so that the number of operators copying each station may be ascertained. Only the *text* (including any punctuation therein) of each message will count (not the preamble, break signs, and the like). Copy what you hear. Do not guess! Credit will of course be deducted for logging anything that was not actually transmitted!!

Mail copies for grading to the A.R.R.L. Communications Department, West Hartford, Conn. Send your original copies — recopying invites errors. An Honor Roll of letter winners and all other participants will appear in *QST*. The relative standings of the various Naval Districts will be determined by comparing the number of letters awarded with the number of copies submitted from each District. In submitting copy please mention it if you are a member of the Naval Service.

Transmissions will be at approximately 25 words per minute and will be preceded by a five-minute CQ call on the following schedule: From Washington: NAA, 9:00 p.m., E.S.T., simultaneously on 4525 and 9050 kc. From San Francisco: NPG, 7:30 p.m., P.S.T., simultaneously on 4045 and 9090 kc.

Predictions of Useful Distances for Amateur Radio Communication in October, November, and December 1941

National Bureau of Standards
Washington, D. C.

THESE predictions are for distance ranges in the five amateur frequency bands regularly useful for long-distance sky-wave transmission, during October, November, and December, 1941. They are based on long-distance reception observations at various places and ionosphere and

field-intensity measurements at Washington. For information on radio wave transmission see pamphlets obtainable from National Bureau of Standards, Washington, D. C., "Radio transmission and the ionosphere," and "Distance ranges of radio waves."

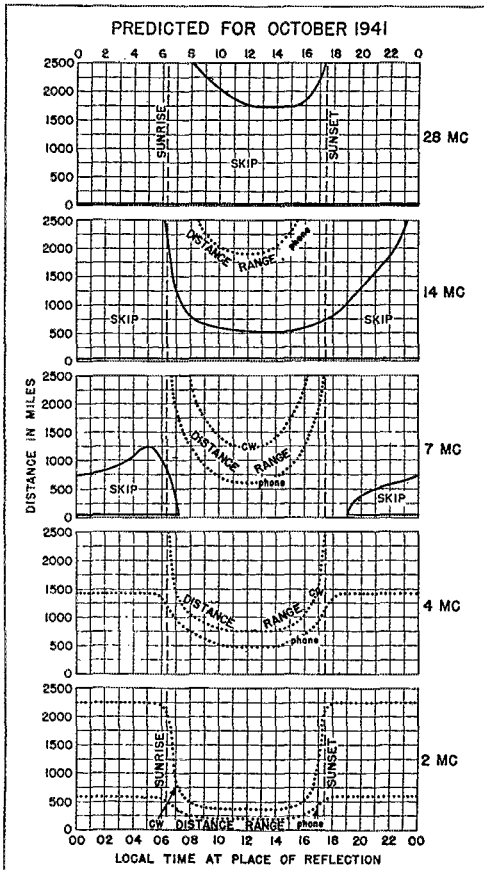


Fig. 1. Useful distances for radio wave propagation via the regular layers of the ionosphere, predicted for October, 1941. The solid graphs show the skip zone; the dotted graphs show the upper limits of useful distances. The 56-Mc. band will be useful only for local transmission (optical and quasi-optical paths).

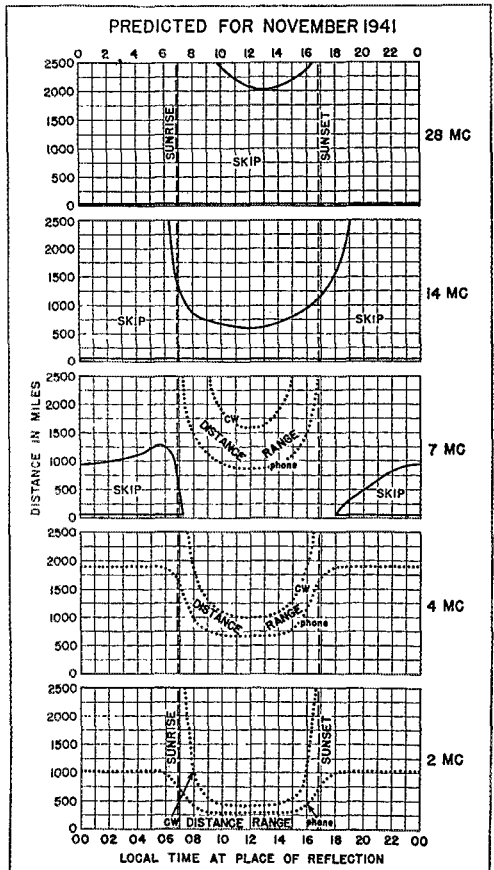


Fig. 2. Useful distances for radio wave propagation via the regular layers of the ionosphere, predicted for November, 1941. The solid graphs show the skip zone; the dotted graphs show the upper limits of useful distances. The 56-Mc. band will be useful only for local transmission (optical and quasi-optical paths).

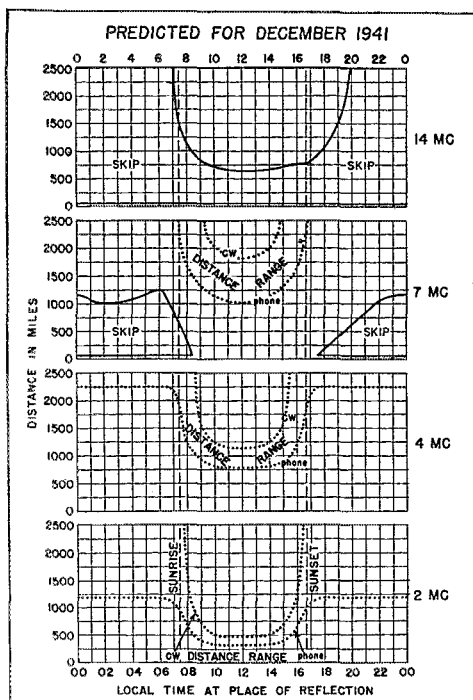


Fig. 3. Useful distances for radio wave propagation via the regular layers of the ionosphere, predicted for December, 1941. The solid graphs show the skip zone; the dotted graphs show the upper limits of useful distances. The 28-Mc. and 56-Mc. bands will be useful only for local transmission (optical and quasi-optical paths).

The use of the graphs was explained in the article in the September, 1940, issue of *QST*, page 26, entitled "Predictions of useful distances for amateur communication."

The dotted curves showing the maximum distance ranges are labeled "phone" or "c.w." They differ because a greater field intensity is needed for good 'phone reception than for good c.w. reception. These curves are based on 100 watts radiated power, both for 'phone and c.w. Higher-power transmitters can transmit to distances greater than shown by the dotted curves; lower power transmitters to distances not as great. For example, to produce a good c.w. signal at the distance shown by the "'phone" curves would require a power of only 2 watts; to produce a good 'phone signal at the distance shown by the "c.w." curves would require a power of 8 kw. These maximum distance ranges are only approximate, for variations in conditions at the receiving station such as static, type of receiver, and antenna directivity may cause the distance ranges to vary by a factor of two or three to one.

The solid-line curves show average skip distances. Skip distances may vary from day to day as much as 25% from the values shown. For ex-

ample, at 17 o'clock on a day in November the average skip distance for 14 Mc. will be 1200 miles; the skip distance will almost always be greater than 900 miles and almost never be greater than 1500 miles.

As winter approaches, the following important differences in transmission will occur: decreased absorption and static, and consequently greater useful distance ranges; decreased day skip distances and increased night skip distances, for transmission via the regular layers; great decrease in sporadic-E transmission and thus a decrease in irregular transmissions at 28 Mc. and 56 Mc. at distances exceeding about 400 miles; regular day transmissions at 28 Mc. during October and November.

Get Your Code Proficiency Award

EVERY U. S. A. amateur licensee is invited by ARRL to get this certification and recognition as soon as possible. If you haven't been so recognized, see that you take steps to-day to have this operating achievement award coming your way!

Use the ARRL practice, listen to the tape-sent commercial transmissions listed elsewhere, note the dates of the next W1AW-qualifying-runs and get in on them. Copy the test text at the best speed you can. Underline the full minute of perfect copy necessary to qualify at any speed. Tell us if you copied by ear without help except for your pencil or mill (mention which used), and if you are working for first certificate or endorsement. Send in copy and statement. Mark your envelope to ARRL "Code Proficiency Copy" to speed the routing and checking. Staff members will gladly check your paper with the official tape, then advising you of success or failure, sending any appropriate award or advices within thirty days from the date of any qualifying run.

Opportunity for getting the League's Code Proficiency Certificate Award or to try out for a silver endorsement sticker (for demonstrating increases from the original word speed certified) will be given in the next qualifying runs, as follows:

Sept. 20th (Sat.) 9:45 P.M. E.S.T. (Text at 10 P.M. E.S.T.)
 Oct. 5th (Sun.) 1:30 P.M. E.S.T. (Text at 1:45 P.M. E.S.T.)
 Oct. 19th (Sun.) 9:45 P.M. E.S.T. (Text at 10 P.M. E.S.T.)

Practice transmissions are sent nightly, except Friday, from W1AW. These start at 9:45 P.M. E.S.T. (8:45 P.M. C.S.T., 7:45 P.M. M.S.T., 6:45 P.M. P.S.T.) using 1762, 3575, 7150, 14,253, 28,510 and 58,970 kcs. (simultaneous transmission). Approximately 10 minutes' practice is sent at progressive speeds of 15-20-25-30-35 words per minute. Besides this special practice material ARRL official messages "to all radio amateurs" are sent by tape at 8:30 P.M. and midnight E.S.T. at one of the three lower speeds, giving opportunity for additional practice.

— F. E. H.

The Secrets of Good Sending

In Two Parts—Part II*

BY E. L. BATTEY,** WIUE

Correct Character Formations

ONCE the dot-rhythm and dash-rhythm have been mastered, we can proceed to the consideration of the correct formation of each character. This is an important consideration, for if we do not make every letter and numeral correctly we will never send good code. There can be no characters sent incorrectly. It is one thing to know how we want a character to sound but another thing to make it sound that way! Let's analyze the correct manner in which to make each character. Starting with the basic letters, E and T, practically every character is composed of combinations of other characters. A study of the correct rhythm for each character (how it sounds when sent correctly) discloses that certain groups of letters and numerals are associated. It is urged that you practice the characters in accordance with the following plan. The letters listed in each group are more or less associated and it is recommended that practice be "by groups," with each letter mastered in the order given within each group.

Group No. 1: The characters E, I, S, H and 5. These have been covered under the heading of "Developing Rhythm." With the correct dot-rhythm mastered, you can send all of these dot characters. If you experience any difficulty, go back and send a series of evenly-spaced dots (Di-di-di-di-di-di, etc.). When your wrist responds, send a 5, using the same rhythm as for the longer series . . . send an H likewise, etc. This same dot-rhythm carries over into other characters which are made up of dot-dash combinations.

Group No. 2: The characters T, M, O and Ø. These were covered under the subject of correct dash-rhythm. Little difficulty is usually encountered in making dash-characters. If, however, you find yourself sending them jerkily, go back and practice the dash-series-exercise (Dah-dah-dah-dah-dah-dah-dah-dah, etc.) until you regain the feel of this action.

Group No. 3: The characters A, R, L, W, J, 1 and P. These all have as their groundwork the letter A (di-dah). First master that letter by sending several times a smooth di-dah, di-dah, di-dah, keeping the space between the "di" and "dah" equal only to one "di." Then send an R (di-dah-

di), which is actually the letters AE sent together as one character. Always bear in mind that the space between any parts of a character is the same length as a "di." Next try an L (di-dah-di-di), which is actually AI sent as one character. Next send W (di-dah-dah), thinking of it as AT sent together. If you can send A successfully, you can send R, L and W similarly. The letter J (di-dah-dah-dah) should be thought of as WT sent together. The numeral 1 (di-dah-dah-dah-dah) should be considered as JT sent as a single character. It will be noticed that these combinations give a smooth continuity for each character. The letter P (di-dah-dah-di) should be considered as WE sent as one smooth character. Care must be taken in sending each of these characters that no additional space is left between the two letters making up the complete character. For example: although P is WE, take care that you do not leave more than one-dot length between the W and E. The overscore indicates that the two letters are sent rhythmically as *one* sound (di-dah-dah-di).

Group No. 4: The characters U, F, 2, V, 3 and 4. Master first the letter U (di-di-dah). Do not think of U as any combination of letters; think of it only as "di-di-dah" sent smoothly. (A dangerous misconception is to think of U as the letters IT; avoid this, or your character is apt to sound jerky.) Think only of the sound "di-di-dah." Next, tackle the letter F (di-di-dah-di), using the basic letter U as a foundation. F is actually UE sent as one character. If you can send U, you can send F. The numeral 2 (di-di-dah-dah-dah) is made up of the letters UM sent together; think of it this way and you will get a smooth 2. The letter V (di-di-di-dah) must not be considered as any combination of letters. (A common fault is to consider V as ST, resulting in a jerky character.) Think of V only as the sound-combination di-di-di-dah. Practice this, using the dot-rhythm, until you send a smooth letter V. One of the most difficult characters for many operators is the numeral 3 (di-di-di-dah-dah); it is too often sent jerkily (as SM). To send a smooth numeral 3, think of it as VT sent together; there you will have the smooth continuity of a correct 3. Conquer the letter V, and you will have no trouble making 3. The numeral 4 must be considered only as the sound-combination di-di-di-di-dah. Do not attempt to consider the 4 as composed of any letter-combinations (as HT), or you will get a jerky character. In sending the 4, use the same dot-rhythm as you do for the 5, making the last

* Part I appeared in September QST.

** Assistant Communications Manager, A.R.R.L., on leave of absence; Ensign, USNR; instructor, Naval Reserve Radio School, Noroton Heights, Conn.

unit a dash instead of a dot (di-di-di-di-dah).

Group No. 5: The characters N, D, B, 6, 8, 9 and X. The N, of course, is merely a reversal of A. Practice the N (dah-di) by sending several times a smooth dah-di, dah-di, dah-di, keeping the space between the "dah" and "di" equal only to one "di." In making a D (dah-di-di), avoid making it sound jerky (as TI). Think of it only as the combination of sounds dah-di-di, sent evenly. Likewise, the letter B (dah-di-di-di) must be thought of only as the combination dah-di-di-di. (It is a mistake to think of B as a letter-combination, such as TS; this results in a jerky character.) The numeral 6 calls for the same rhythm as a numeral 5, except that our first unit is a "dah" rather than a "di." Think of 6 only as the smooth sound-combination dah-di-di-di-di, evenly spaced. The numeral 8 (dah-dah-dah-di-di) must not be considered as the combination OI; this results in jerkiness. It is best to think of it only as the rhythmic combination dah-dah-dah-di-di. However, the combination MD, with care taken not to leave additional space between M and D, will give you a correct 8. The numeral 9 (dah-dah-dah-dah-di) calls for the same dash-rhythm as does the numeral 0, with the exception that the last unit is a "di" instead of a "dah." The letter X (dah-di-di-dah) should be considered only as the combination dah-di-di-dah. (Avoid thinking of it as letter-combinations, such as DT or TU; these tend to result in a jerky character.) In practicing X, think only of the rhythmic dah-di-di-dah, dah-di-di-dah, dah-di-di-dah.

Group No. 6: The characters G, Q, Z, 7, K, C and Y. Consider the letter G (dah-dah-di) as the sound-combination dah-dah-di. With care to keep the spacing correct it might be thought of as ME sent together, but it should never be thought of as TN. (This usually results in an uneven character.) Next, send a Q (dah-dah-di-dah), considering it as MA sent as one character. (Avoid thinking of Q as GT, which makes for jerkiness.) The letter Z (dah-dah-di-di) may be considered as TD sent together smoothly, although it is better to consider it only as the sound dah-dah-di-di. The numeral 7 (dah-dah-di-di-di) can safely be considered only as the sound-combination dah-dah-di-di-di, sent evenly. (A common mistake is to think of 7 as MS, a jerky combination.) The letter K (dah-di-dah) must be thought of only as the sound dah-di-dah, smoothly executed. (Do not think of K as any letter-combinations, as TA or NT, both resulting in unevenness.)

Probably the most troublesome of all letters is C (dah-di-dah-di). In order to get a smooth character C it is recommended that it be thought of as the combination KE sent as one character. Here you will find a smooth rhythm, as opposed to the combination TR or NN, which are almost sure to result in jerkiness. In actual practice many operators have found the KE combination their answer to correct formation for the letter C. Similarly, the letter Y (dah-di-dah-dah) should be considered as KT, sent together smoothly, as opposed to TW or NM. KT will give you a rhythmic Y. Master the letter K and you will have no trouble with C or Y.

In all of the above examples, it should be emphasized that the overscored letter-combinations represent one sound-combination, not the two sounds of each individual letter concerned. For example: KT stands for dah-di-dah-dah (Y), one rhythmic sound; not dah-di-dah space dah, two separate letter-sounds. In practicing all characters, repeat the sound of them aloud to yourself. (Example: In practicing B, repeat to yourself dah-di-di-di, dah-di-di-di, dah-di-di-di, etc.)

Determine your difficult characters and practice them until you master them. With the correct formation of each character as a basis we can proceed to combine them into words, giving consideration to correct spacing between characters and between words. With incorrect formation of even one character, our sending will lack that "something" which distinguishes between the perfect sender and the run-of-the-mill. That is why we must first consider each character separately and practice each separately until we master them all. Then, and then only, should we start sending words.

Operators find that their difficult letters are not always the difficult letters of other operators. However, there are certain characters which are generally found more difficult than others to send. As a sidelight on this, a group of some 350 beginning operators were asked which characters they found most difficult to send correctly. Their answers showed the following: Approximately 17% found the letter C most difficult; 15% had trouble with the numeral 6; 13% found the numeral 4 difficult; 11%, the numeral 3; 10%, letter V; 9%, F; 8%, numeral 5; 7.6%, L; 7%, H; 6.5%, Y; 6%, P; 5.7%, X. Other difficult characters were, in order, B, 2, 9, Q, 7, G, R and Z. Those giving none of the 350 men trouble were only A, E, I, T, M and W.

Some General Considerations

Aim to send perfect code. Keep your speed at the level at which you make a minimum of errors. Accuracy and perfection come first — speed will come with practice.

"Learn by Sending": Experienced operators say that constant sending-practice builds copying-ability. You not only improve your fist but you



BE SATISFIED ONLY WITH GOOD CODE.

also increase your copying ability by sending to yourself (on an oscillator or buzzer).

The three fundamentals of a good fist: (1) Correct rhythm and wrist action; (2) correct formation of characters; (3) correct spacing. And all three are interdependent.

Don't rush your dots. Send dots at the same speed you send dashes. When you come to dots, don't think you have to rush them or jam them together. You can make dots just as easily as dashes.

Try at all times to make all dots the same length, and all dashes the same length.

Be satisfied only with good code — know how perfect code sounds and strive to make your sending sound the same.

Don't run characters or parts-of-characters together. Keep equal space between all parts of all characters. Keep each character separated from adjacent characters by proper spacing.



Examples of running characters together:— Sending PD for AND, NST for TEST, etc.

Don't send "choppy" code. Do not clip either dots or dashes. Keep them uniform.

Always send the correct number of dots for the character concerned. Ditto dashes. Don't send five dots for H, four dots for 5, dah-di-di-di-di-di-di-di-di for 6, etc. Don't send dah-dah-dah-dah-dah-dah-di for 9, or di-dah-dah-dah-dah-dah for 1, etc. There is but one way to send each character — the right way.

Certain adjacent letters are easily run together unless care is taken. Watch for such combinations as TK, TE, TH, AN, AI, TR, etc., which may easily be misinterpreted as one character if run together.

Request criticism of your sending from good operators of your acquaintance or from those contacted on the air. They may notice some slight fault you could easily correct.

In sending, as in receiving, think of each character as a sound, rather than combinations of dots and dashes. Say them aloud to yourself as you practice sending. Keep your keying in synchronism with your vocal accompaniment.

Take pride in your sending. On the air, someone is always listening to you. You will be judged by your fist.

Avoid repetitions, but if an error is made, always correct it before continuing.

A common fault is to leave too-long spaces between parts of characters, especially where a "di" and "dah" come together. Example: Numeral 3 . . . too much space often is left between the "di's" and the first "dah," making it sound like SM.

Don't "split" your words by pausing in the middle of them. Keep equal space between all letters of any word. Letters should be separated by a space equal in length to the length of a dash.

TABLE OF CORRECT SOUND-COMBINATIONS

For Sending Practice

Consider each letter as its individual rhythmic sound-combination. If you have difficulty forming certain letters, to make them sound right, try the letter-combinations suggested, mastering the first letter, then adding the second unit, sending the whole as one character.

- A — di-dah (not ET)
- B — dah-di-di-di (not TS)
- C — dah-di-dah-di, or KE (not TR or NN)
- D — dah-di-di (not TI)
- E — di
- F — di-di-dah-di, or FE (not IN)
- G — dah-dah-di, or ME (not TN or TTE)
- H — di-di-di-di
- I — di-di
- J — di-dah-dah-dah, or WT (not EO or AM)
- K — dah-di-dah (not TA or NT)
- L — di-dah-di-di, or AI (not ED)
- M — dah-dah
- N — dah-di (not TE)
- O — dah-dah-dah (not TTT)
- P — di-dah-dah-di, or WE (not EG or AN)
- Q — dah-dah-di-dah, or MA (not GT)
- R — di-dah-di, or AE (not EN)
- S — di-di-di
- T — dah
- U — di-di-dah (not IT)
- V — di-di-di-dah (not ST)
- W — di-dah-dah, or AT (not EM)
- X — dah-di-di-dah (not DT or TU)
- Y — dah-di-dah-dah, or KT (not TW or NM)
- Z — dah-dah-di-di, or MI
- 1 — di-dah-dah-dah-dah, or JT
- 2 — di-di-dah-dah-dah, or UM (not IO)
- 3 — di-di-di-dah-dah, or VT (not SM)
- 4 — di-di-di-di-dah
- 5 — di-di-di-di-di
- 6 — dah-di-di-di-di (not TH)
- 7 — dah-dah-di-di-di (not MS)
- 8 — dah-dah-dah-di-di, or MD (not OI)
- 9 — dah-dah-dah-dah-di
- 0 — dah-dah-dah-dah-dah

~~Strays~~

The F.C.C. has designated for hearing an application for construction permit for two portable experimental stations to operate on frequencies between 300 and 400 Mc. Applicant proposes to develop a new radio system to replace the conventional automobile horn! Ho-hum!

ARRL Battery-Powered Equipment Test

October 18th-19th—Check UHF and/or LF Rigs in Saturday Noon to 10 P. M. Sunday Contest—Everybody Invited—Emergency Corps Members Urged to Take Part

BY F. E. HANDY,* WIBDI

IT'S FUN to test out the capabilities of portable self-powered equipment at *any* time. It is a duty every responsible amateur owes himself and his hobby to have and test equipment for possible emergency uses before the blizzard, storm, flood or hurricane season, and especially in these times to make sure his equipment is *right*. A willingness to serve is but a part of the measure of our potential usefulness. The practical ability to serve must supplement our commendable willingness. This ability is achieved (1) through building and holding ready numerous complete amateur equipments of the type *with handles on 'em* and (2) by operating-testing of the gear at intervals in practical workouts.

There is no laboratory test like the test of actual experience. That is why an ARRL October contest to refresh our experience in setting up, to disclose any items not up to standard in our equipment, to stimulate making new individual self-powered stations ready for portable utilization is on the books for number one test this fall.

There never have been enough individual portables ready before general emergencies to take advantage of more than part of the opportunities for rendering useful service. All FCC licensees, whatever their equipment, are invited to register¹ in the ARRL Emergency Corps, giving radio coverage of points not in networks and creating groups of amateurs organized for practical emergency needs in the larger towns. Nearly 3500 stations are in the Corps now, 31% of these self-powered with others pledged to complete such gear as soon as possible. This activity is one incentive to do so. *Every* amateur, whether AEC yet or not, should get in this low-power test of battery-powered equipment.

Considerable progress has been made through the annual Field Days in adding to our store of gas-driven equipments. Those FD's will be continued. But we also need more individual-class lightweight, portable setups, wholly self-powered and capable of quick movement and installation in minimum time. This new test is aimed at this latter field in which we hope like progress may soon be made. Amateur radio needs more battery-powered portables that need only a car battery to

make them work, that can be used afield near the car, at the home station when commercial power is unavailable, or from other places should emergency require.

In this test if you can go to a location *away from* the home station by all means do so. You will meet more unknown factors and have some of the FD thrills and be credited with an appropriate multiplier. Since there are those who cannot go afield this is not a *requirement*. Genemotor-vibrapak-battery stations with *both* receiver and transmitter operating independent of commercial mains can be tested *right at home stations*, even on home antennas.

When so operated participants must include a signed statement that entirely self-powered equipment was utilized in connection with all points claimed.

UHF and LF Work Score Separately

UHF and low-frequency operation cover widely different conditions. Independent score listings for above-56- and below-56-Mc., therefore, will be made. Participants are welcome to use transmitters taking not more than 30-watts input to final, and to report on work for either one or both score listings. Voice or telegraph work may be entered, or a combination of both. Points made using transmitter on 56 Mc. and higher frequency bands will be recorded in one UHF list. All points recorded in the contest period with one's transmitter on amateur bands below 56 Mc. will be in a separate LF list. Should a UHF and LF station hook up the points will be listed as determined by the transmitter frequency of the reporting operator.

1. Operating Time: Starts Saturday, Oct. 18th, 12:01 P.M. local time. Ends Sunday, Oct. 19th, 10:00 P.M. local time. UHF Points may be made without limit within above period. Low Frequency Points must all be made 12:01 P.M. to sunset local time Saturday, and during the hours between local sunrise and sunset Sunday. *All low-frequency battery powered testing afield, or away from the home station location (of equipment for domestic communications emergencies) must, of course, follow 48-hours advance notice to the FCC Inspector of the district in which the operation will take place per Temporary FCC Order No. 73.*

* Communications Manager, ARRL.

¹ A postal to Hq. will bring the AEC registration blanks to be filled out in duplicate and returned.

HOW TO SCORE

UHF Lists:

	Points
(a) Each contact with another station	1
(b) Each "weight" figure transmitted and acknowledged	1
(c) Each "weight" figure received and recorded	1
Maximum points for a contact	3
(d) Multiply sum of contact points by the number of u.h.f. bands used.	
(e) Multiply result of (d) by two if station is operated in field for all points scored.	

LF Lists:

Score the same as above but substitute the number of ARRL Sections worked in (d) for the number of u.h.f. bands used as a multiplier.

2. **Contest Exchanges:** (A) The aim of test operations is to contact as many different amateur stations in the test period as possible, and exchange information on the weight² of the battery-powered transmitters in use. On low-frequency the location of the ARRL Section³ shall also be exchanged. Each different station contacted counts one point toward the score. Another point is credited for sending information on the weight of one's own transmitter, if this is receipted for. Still another point may be credited for received information on the transmitter-weight of the station worked if this data is receipted for over the air and this weight reported in the record sent ARRL. Amateur stations not in the battery-powered contest also may be worked for one point credit only, or for 2 points credit if you send data on weight to such a station and get his OK or receipt. Operators *not* on battery power obviously cannot give the weight of a battery-powered rig that they don't have! (B) *UHF Scores* shall be the sum of points made as above with a contestant's transmitter tuned to authorized amateur frequencies of 56 Mc. and higher *multiplied by the number of different u.h.f. amateur bands* on which at least one contact was made. *LF Scores* shall be the sum of the points made as above with a contestant's transmitter tuned to authorized amateur frequencies of 30 Mc. and below multiplied by the number of ARRL Sections³ on which at least one contact was made. In addition to the above, the individual station points in either UHF or LF lists take a separate multiplier of *two*, when you made the point operating afield (away from your home station location).

² For a transceiver or combined equipment, give weight of combination, all components included. Ordinarily the weight of the transmitter unit, not including weight of battery or supply components will be given.

³ See complete list of ARRL Sections on page 4 of *QST*.

3. **Scoring Record:** A tabulation of the different stations worked showing weight data received shall be submitted with claimed score and Sections shall be shown in LF scores. Lists must be submitted on separate sheets representing UHF and LF work. The same call may appear in the two lists, but not twice in the same list.
4. **Equipment Limit:** But a single receiver and transmitter equipment may be operated by a contestant station at one time, although operating frequency may be changed at will with the amateur bands.
5. **Batteries** must be used as a prime source of power without recourse to any public utility or gas-electric supply. Batteries may be dry or storage type cells, and genemotors, vibrapacks, etc., may be used to modify voltages to set requirements.
6. **Power Level:** No transmitter with a power level above 30 watts input to final may be entered.
7. **Statement:** The operator of each station reporting results for mention must submit a signed statement, "The points in my summary are correct and true, the power input to the transmitter final was at all times below 30 watts, and both receiver and transmitter utilized battery-power throughout in accomplishing the work reported on herewith . . . (signed)."

Oklahoma State Convention

(WEST GULF DIVISION)

**Enid, Oklahoma, October
18th-19th**

THE annual Oklahoma State Convention, sponsored this year by the Enid Amateur Radio Club, is to be held Saturday and Sunday, October 18th and 19th, at the Youngblood Hotel in Enid. Saturday afternoon will be devoted to technical discussions and demonstrations, followed by a Dutch lunch supper in the evening. Sunday morning's program will include meetings of the various traffic and operating groups, and a code contest. The banquet will be at 2:00 P.M. Sunday. Registration fee is \$2.50. For further information write Thomas H. Depew, W5GHN, 814 East Elm, Enid, Okla.



WINGV puts waves in women's hair during the day and waves on the air at night. He's a hairdresser.

Automatic Direction Finding

The Principle of Aeronautical ADF Systems

BY RALPH GIBBONS,* W7KV

A DEVICE called the radio compass was introduced to air navigation in about 1932. This was a true name for the device because it consisted of a pointer which pointed at all times to the radio station tuned in on the system rather than to magnetic north. The principle of this device, briefly, is as follows: If both a loop antenna and a vertical (non-directional) antenna are connected to a radio receiver through suitable coupling devices and phase-shifting networks, the resulting field pattern is a cardioid,¹ as shown in Fig. 1-A. If the connections of the loop (or vertical antenna) are reversed, the resulting pattern will still be a cardioid but with the null rotated 180° (Fig. 1-B), i.e., the maximum signal will now come in along the line that previously gave minimum response. The radio compass consisted of a radio receiver to which was connected a zero-center output meter and electronic switching for simultaneously reversing the polarity of the meter and the polarity of the loop antenna. If the radio station were located directly ahead, reversing the loop connections would not increase or decrease the amount of receiver output and hence the needle would not deflect (Fig. 1-C). If, however, the station were located to the right or left, the pickup would be greater with one loop connection than the other and the needle would deflect in the corresponding direction. This device was not particularly useful to the pilot because it didn't tell him where he was but only whether he was headed towards the radio station. A strong cross-wind would make him fly a course considerably different than the direct route, and this is very undesirable from the standpoint of commercial operation. A few years ago someone conceived the idea of adding electrical contacts

(in effect) to either side of the loop movement, these contacts in turn to close the circuits of an electric motor that would rotate the loop. The position of the loop could then be indicated on an azimuth scale. Thus if the station is to the right or left of the plane, when the signal is tuned in the loop will rotate until the meter is returned to zero, and the position of the loop, as indicated on the azimuth indicator, gives the bearing of the radio station from the plane. This device, as contrasted with the radio compass, is extremely useful to the transport pilot. By tuning in two stations the pilot can plot bearings and obtain a "fix," i.e., calculate his position. If he is already on a radio course a single bearing will give this fix.

A better picture of the workings of an ADF system can be obtained by referring to Fig. 2. Essentially it consists of a loop antenna, a loop amplifier and 90° phase shifter, an electronic switch (it looks something like a balanced modulator), a non-directional antenna, a sensitive and selective receiver, a thyatron (grid-controlled rectifiers) azimuth control circuit and an audio oscillator.

The loop antenna is directional in that the voltage induced in the loop is maximum when the plane of the loop is turned towards the transmitter and is zero when the plane of the loop is perpendicular to the line from the transmitter. The resultant of the voltage induced in the loop is 90° out of phase with the voltage induced in the vertical antenna and changes abruptly 180° as the loop is rotated through the position of zero pickup. The voltage from the loop is amplified and shifted through 90° so that it is either in phase with, or in phase opposition to, the voltage induced in the vertical antenna, depending upon which edge of the loop is turned towards the transmitter.

The voltage from the loop amplifier is then fed

* c/o United Air Lines, Portland, Ore.
¹ Bruning, "Radio Direction Finding," *QST*, August, 1940.

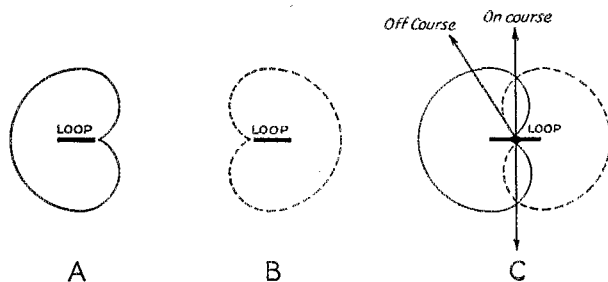


Fig. 1—The pattern shown at A indicates the response obtained from a loop antenna worked in conjunction with a non-directional antenna of equal pick-up (and a 90° phase shift). B shows the pattern obtained when the loop connections are reversed. C is the composite pattern obtained by rapidly reversing the loop connections, and indicates how the system can be used to determine the sense of an off-course signal through the resultant unequal pick-ups.

You probably know that aeroplanes use radio for determining their position and for keeping on course, but do you know how the systems operate? Here is the explanation of the ingenious methods used, as given by a captain on the Portland-Salt Lake Division of UA and a former A.R.R.L. director.

into the electronic switch stage. The circuit of this stage looks somewhat similar to a balanced modulator stage, where two tubes are connected in push-pull with an additional coupling circuit in the common grid return. The output of the loop amplifier is fed into this common grid circuit and the output from an audio oscillator is fed to the grids in push-pull. The result is that, depending upon the polarity of the voltage from the audio oscillator, one tube amplifies during part of half of the audio cycle and the other tube amplifies during part of the other half of the audio cycle. The plates of the two tubes are connected in push-pull through a tuned circuit and, because of the switching action through the two tubes, the phase of the current in this circuit will reverse in accordance with the audio oscillator.

From the electronic switch stage the loop signal is combined with the signal from the non-directional antenna and amplified and detected in a regular receiver circuit. The output signal from the grids of the two thyatron tubes used to control the loop motor. The plates of the thyratrons are fed in push-pull by the audio oscillator and, depending upon which way the loop is turned, the phase relation determines which of the thyratrons will fire and thus which way the loop will turn. When the loop is broadside to the direction of the radio station, the difference or resultant is zero and the motor does not operate. The circuits are arranged so that if the radio signal is coming from the left the modulation is such that the indicator points to the left, and if the radio signal is from the right the pointer turns to the right.

The directional accuracy of the ADF system is excellent under normal conditions, but there are several factors influencing its accuracy under adverse conditions. Crash static has little or no effect except to cause a spurt of a few degrees in one direction or the other during the crash or crashes. However, thermal or heat lightning, because of its more continuous nature, offers a greater problem. During intense conditions, when the discharge is almost continuous, the pointer may tend to swing away from the station and towards the direction of the center of the thermal static agitation. Swings up to plus or minus 90° have been observed. Under such cases, the experience and intelligence of the operator in taking

his bearing during periods of least static is of major importance, and automatic operation is limited to 40 or 50 miles. Any ADF system will give erroneous readings in mountainous regions where reflections or multiple reflections of the signal takes place, since the system senses the signal as coming from these points of reflection.

However, the ADF idea has opened new fields in commercial aviation. A new dual automatic azimuth bearing indicator has been released which combines two ADF's that can be tuned to two separate stations within its range. The azimuth bearings thus obtained are indicated on a single dial scale through the medium of red and green needles concentrically projecting across the scale face. In operation it is possible to tune in a station ahead of the aircraft on one direction finder and a station aft of the aircraft on the second unit, with the bearings indicated by the two

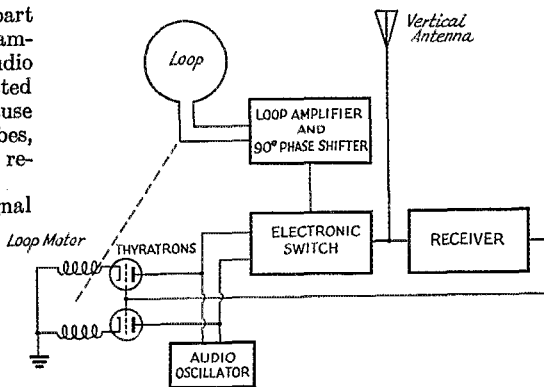


Fig. 2 — Block diagram of an ADF system.

colored needles. Thus, in flying a straight route between two stations not served directly by radio range courses the plane's position is indicated by the two needles which, with the plane on course, will be separated by 180°. Should the craft deviate from a straight line between the two stations to which the direction finders are tuned, this fact is immediately and continuously shown by the tendency of the two needles to turn towards each other.

Strays

Muriatic acid commercial is effective in cleaning copper-tubing coils. It should be applied lightly with a piece of old linen or towelling. The fumes are obnoxious, so don't inhale strongly. While the acid is not dangerous to the skin, it will attack clothing. Rinse in cold water. Out-of-door treatment is recommended. — W8DII.

W9LPQ is located in Sullivan, Ind., W9LPR in Sullivan, Ill.

A 56-Mc. Transmitter for Mobile Work

Simple Construction of a 12-Watt A.M. Rig

BY BYRON GOODMAN,* WIJPE AND HAL BUBB,** WIJTD

Although the design of a mobile 56-Mc. transmitter must usually be tailored to meet the restrictions set by the type of automobile used, here is a transmitter that can be used in practically any car that has a trunk rack. A dash-board control system is also described, with suggestions for installing the power supply.

THE design of a fixed-station transmitter usually starts with the final stage and works back through the exciter stages to the power supply, but the design of a portable or mobile rig hinges on the available power supply. Batteries can be used for portable or mobile rigs, but their use is generally limited to the low-power class of not more than one or two watts input. The next group of available power supplies falls around the 30- to 40-watt class and includes vibrator packs and small motor-generators. Above that one jumps into a power class where the design is not dictated quite as much by the power supply as by how much one can afford to pay.

The transmitter to be described was designed to work from a power supply delivering 125 ma. at 325 volts. Working from a 300-volt supply brings up the current drain slightly above rating and is not recommended except in case of emergency. This puts it in the class served by vibrator packs and small motor-generators that are not expensive and can be operated from the regular automobile battery without overload. Since maximum economy is desired in the exciter and audio stages, high-gain doubler tubes and Class-B audio for modulation were used. A minimum excitation requirement dictates the use of a beam tube as the modulated amplifier.

* Assistant Technical Editor, QST.

** Chief Operator and Station Engineer, WIAW.

The Circuit

After trying several experimental arrangements, the line-up shown in Fig. 1 was selected as a very practical one. A 6AG7 Tri-tet oscillator using a 7-Mc. crystal—considered to be more sure-fire than a 14-Mc. crystal—quadruples in its plate circuit to 28 Mc. to drive a 6AG7 doubler to 56 Mc. The 6AG7 is a high-gain pentode designed for television work, and it makes an excellent crystal oscillator or frequency multiplier for amateur work. The output of the doubler is used to drive a 6V6 amplifier on 56 Mc. A 6L6 was tried instead of the 6V6 but showed no improvement in any way at the input the amplifier runs (12 watts). Provision for neutralizing the 6V6 was included at first, but it was found unnecessary in this particular parts arrangement. It is not to be assumed, however, that the 6V6 will work well at 56 Mc. without neutralization in every arrangement—the necessary neutralizing capacity is small and is doubtless present in this layout as a stray capacity. The grid of the 6V6 is tapped down on the driver plate coil to lighten the loading.

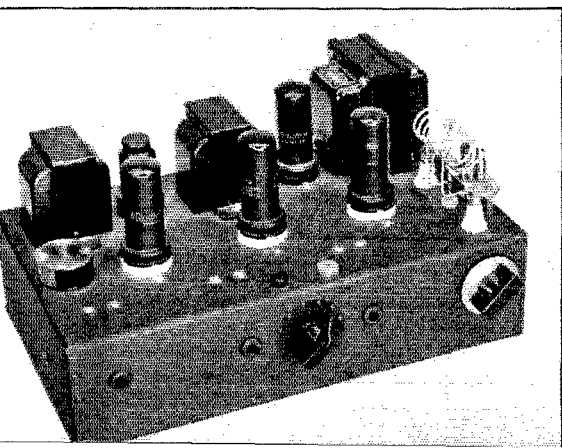
The modulation equipment consists of a 6C5 driver stage and a 6N7 Class-B modulator. Anything except a single-button microphone would have required more audio gain and would have introduced the possibility of more hash pick-up because of the lower level of the output of the microphone. While single-button microphones do not give "broadcast quality," there can be little or no complaint about their effectiveness and reliability, important factors in any portable/mobile unit.

Construction

The transmitter is built on a 7- by 12- by 3-inch chassis, thus providing plenty of room for the parts. Reference to the photographs will show the placement of parts, but some of the minor

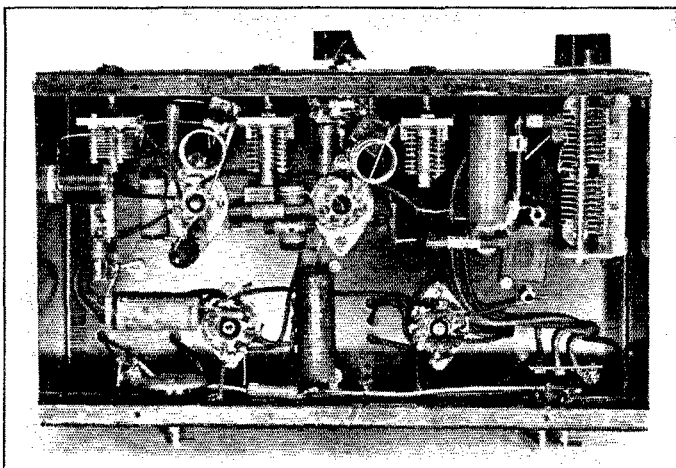
A complete 12-watt 56-Mc. 'phone transmitter, ready for installation in car or home. The tubes along the front, from left to right, are 6AG7 Tri-tet oscillator, 6AG7 doubler and 6V6 final amplifier. The 6C5 driver (left) and the 6N7 Class-B modulator are at the rear between the transformers. The knob on the right controls the final tank condenser—the other tuning condensers are adjusted by screw driver through the rubber grommets. The meter switch is mounted on the front center, just under the meter pin jacks.

Note that the antenna coil is mounted on the antenna binding post strip—coupling is adjusted by swinging the coil.



QST for

A view under the chassis of the 56-Mc. transmitter shows the straightforward arrangement of parts. The coils L_2 and L_3 are self-supporting and are mounted on their respective condensers. Note the audio volume control and the power supply plug mounted at the rear of the chassis. The microphone lead from the plug to the microphone transformer is run through grounded shield braid.



constructional points should be pointed out. The tuning condensers C_1 , C_2 and C_3 are mounted on the underside of the chassis on the small brackets that are furnished with them, and they are set far enough back from the front so that the ends of the shafts do not quite touch the metal. They are adjusted by a screw driver that is prevented from shorting to the chassis by

rubber grommets in the holes. The final tank condenser, C_4 , is supported on the panel.

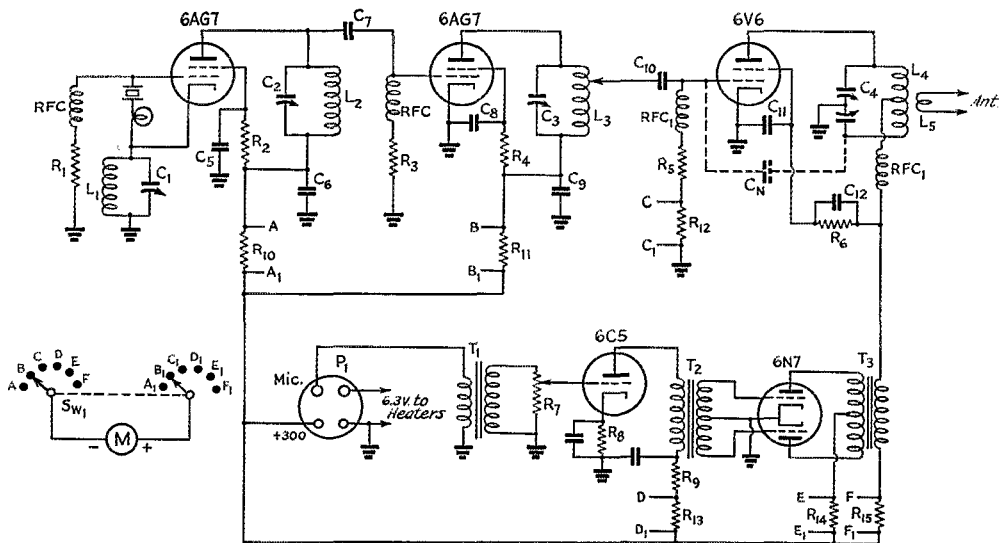


Fig. 1 — Wiring diagram of the 56-Mc. 'phone transmitter.

- | | | |
|--|---|---|
| C_1 — 50- μ fd. variable (National UM-50). | C_{13} — 25- μ fd., 25-volt electrolytic. | RFC — 2.5-mh. r.f. choke (National R-100U). |
| C_2 , C_3 — 25- μ fd. variable (National UMA-25). | CN — See text. | RFC ₁ — U.h.f. r.f. choke (Ohmite Z1). |
| C_4 — 30- μ fd. per section variable (Hammarlund HFD-30-X). | R_1 , R_3 — 0.2 megohms, 1-watt. | Sw1 — 2-circuit, 5-position rotary switch, non-shorting (Malloy 3226J). |
| C_5 , C_8 — 0.01- μ fd., 400-volt paper. | R_2 , R_4 — 40,000 ohms, 1-watt. | T_1 — Microphone transformer (Stancor A-4726). |
| C_6 , C_9 , C_{11} — 0.002- μ fd. mica. | R_5 — 30,000 ohms, 1-watt. | T_2 — Driver transformer (Stancor A-4721). |
| C_7 , C_{10} — 250- μ fd. mica. | R_6 — 5,000 ohms, 2-watt. | |
| C_{12} , C_{14} — 8- μ fd., 450-volt electrolytic. | R_7 — 0.1-megohm volume control. | |
| T_3 — Modulation transformer (Stancor A-3845). | R_8 — 1000 ohms, $\frac{1}{2}$ -watt. | |
| L_1 — 19 turns No. 18 enam., spaced slightly to occupy $\frac{3}{8}$ -inch winding length, on $\frac{3}{4}$ -inch diam. form (National PRF-2). | R_9 — 6000 ohms, 1-watt. | |
| L_2 — 8 turns No. 14, spaced to occupy $1\frac{1}{8}$ inch, $\frac{7}{8}$ -inch diam., self-supporting. | R_{10} — 25 ohms, $\frac{1}{2}$ -watt. | |
| L_3 — $3\frac{1}{2}$ turns No. 14, spaced to occupy $\frac{1}{2}$ inch, | | |
| | | $\frac{1}{8}$ -inch diam., self-supporting. 6V6 grid tap 1 turn from plate end. |
| | | L_4 — 3 turns No. 14, each side center-spaced to occupy $\frac{3}{4}$ inch, $\frac{7}{8}$ -inch diam. |
| | | L_5 — 2 turns No. 14, $\frac{1}{8}$ -inch diam. |
| | | P_1 — 4-prong base-mounting plug (Amphenol RCP-4). Lamp in series with crystal is 60-ma. dial light. |

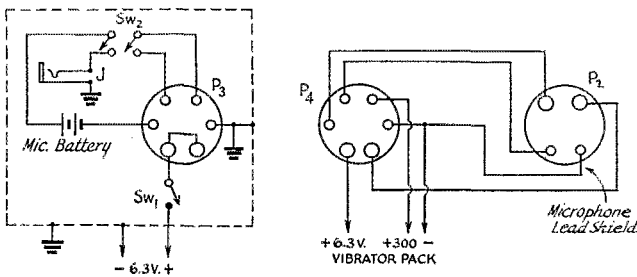


Fig. 2 — Circuit diagram of control box.

- J — Small microphone jack (Mallory 702B).
- Sw1 — D.p.s.t. high-current toggle with sections in parallel.
- Sw2 — D.p.s.t. toggle.
- P2 — 4-prong cable socket (Amphenol PF-4).
- P3 — 6-prong cable plug (Amphenol RCP-6).
- P4 — 6-prong cable socket (Amphenol PF-6).
- Battery is Burgess 3A2. Microphone lead is shielded throughout.

All of the inductances are mounted on or near their respective tuning condensers except the final tank coil, L_4 , which is mounted above the chassis on feed-through insulators. This makes it more convenient to adjust the antenna coupling coil, L_5 , after installing the transmitter in the car.

The plate circuits and the final grid circuit can be metered by plugging in the meter leads to the two pin jacks on the front center of the chassis and setting the meter switch to the proper position. This is a convenience when tuning up with a different crystal or antenna. The power leads are terminated at a four-prong plug mounted on the back of the chassis.

Control Circuit

One problem in connection with mobile units is the drop in the line from the battery to the vibrator or motor-generator unit, and these leads must be kept as short as possible. This transmitter is intended to be mounted in the trunk rack of the car, with the control box mounted on the dashboard of the car and the vibrator pack mounted under the hood on the fire wall. This is, of course, for a car with the battery under the hood — for cars with the battery elsewhere the vibrator pack and control box might have to be mounted differently. There isn't too much drop in the leads running back to the heaters of the tubes from the battery if heavy wire is used, and the drop in the 300-volt line from the vibrator pack is negligible.

The wiring diagram of the control box is shown in Fig. 2. As can be seen, the microphone battery is mounted in this box, and a jack is provided for the microphone. The switch Sw_1 turns on the vibrator pack and the heaters of the tubes, while switch Sw_2 is used as an "on-off" switch for the transmitter, since it controls the microphone battery and the plate supply lead. The control box is a small 4- by 4- by 2-inch box (Parmet MC-442) and takes up very little room.

An alternative system is to mount the vibrator pack and an additional storage battery in the trunk rack and to control both the "on-off" of the heaters and vibrator pack and of the plate power through suitable relays controlled from the dash. However, the storage battery must be removed from the car for charging, and thus the installation may not be always "ready to go."

Tuning the Transmitter

The adjustment of the transmitter is conventional in every way and it should not be necessary to repeat here how to tune a crystal-controlled transmitter. With 325 volts from the power supply, the total plate and screen currents of the 6AG7 Tri-tet and the 6AG7 doubler will be 12 and 16 ma. respectively, and the final grid current should run about 2 ma. If, when the voltage is removed from the screen and plate of the 6V6 final, there is no flicker in the grid current as the final tank is tuned through resonance, there is no need to worry about neutralizing the final amplifier. However, if a flicker (of 0.1 ma. or so) does show up, the amplifier can be neutralized readily by running a stiff wire from the free end of the final tank over near the grid terminal on the 6V6 socket to form a neutralizing condenser (shown by dotted lines in Fig. 1). The stage is then neutralized in the usual manner, varying the neutralizing capacity by moving the free end of the wire. Connecting the voltage to the screen and plate of the 6V6 and tuning to resonance, the total plate and screen current should run under 35 ma. unloaded and about 39 or 40 ma. loaded.

The 6C5 plate current will run around 8 ma., the no-signal 6N7 plate current around 35 ma., kicking up to about 50 ma. on peaks.

The antenna can be anything from 0.25- to 0.6-wavelength long, depending upon what one has available and what the XYL's aesthetic sense will stand. Since the transmitter can be mounted close to the end of the antenna, there is no particular problem in feeding the antenna aside from finding a suitable insulator to run through the side of the car. If something near a quarter-wavelength long is used for the antenna, one side of the antenna coil, L_5 , should be grounded to the car and a variable condenser connected in series with the antenna and the other side of L_5 . When the antenna is near a half-wavelength long, parallel tuning of L_5 should be used. The center of L_5 can be grounded or the whole thing can be left floating. Regardless of the length of antenna, the antenna coupling is varied by movement of L_5 with respect to L_4 after tuning both amplifier and tank circuit to resonance.



ARMY-AMATEUR RADIO SYSTEM ACTIVITIES



War Department, Office of the Chief Signal Officer, Washington, D. C.

REALLOCATION OF A.A.R.S. NET FREQUENCIES

THE changes in the frequencies assigned to some AARS nets, necessitated by the temporary allocation of 3650-3950 kc. to the Army, is progressing satisfactorily. It is expected that much use will be made of the 1750- to 1900-kc. band for new nets as well as for a number previously operating in 3500-3900 kc. A revised directory of AARS nets and their assigned frequencies will be compiled in the near future. The reallocation of Army-Amateur radio net frequencies is being coordinated by the Liaison Officer, AARS, with Corps Area Signal Officers and with the ARRL Communications Manager.

W2CLA APPOINTED CHIEF RADIO AIDE

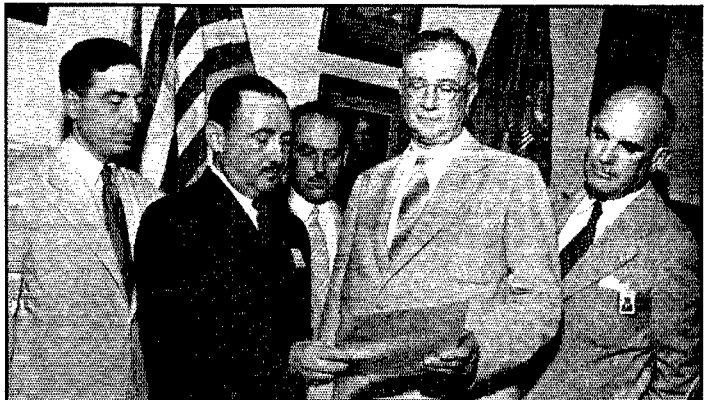
THE Chief Signal Officer has appointed Dr. Lawrence J. Dunn, W2CLA/WLMD of Garden City, N. Y., the Chief Radio Aide of the Army-Amateur Radio System. The appointment was effective July 26th for a one-year period. Dr. Dunn's duties will include advising the Chief Signal Officer on matters affecting the status of the radio amateur, liaison with Corps Area Radio Aides in furthering the interest of Army-Amateur members and assisting the Liaison Officer, AARS — Major David Talley in the OCSO — in the administration and operation of the Army-Amateur Radio System. In addition, Dr. Dunn will maintain close contact with ARRL Headquarters.

Dr. Dunn's amateur radio experience dates back to 1908 when he first became interested in wireless. He received his first amateur station license from the Department of Commerce in 1913 and experimented in receiving and transmitting,

using the crude apparatus of that day. During the World War, Larry Dunn served as a 1st Lieutenant in the Dental Corps. He resigned his Regular Army commission in 1920 to return to private dentistry practice in Brooklyn. His interest in radio was revived upon his return to civilian life and he again established an amateur radio station and received the call 2CLA in 1921, which he has held continuously as W2CLA. Dr. Dunn collaborated in the formation of the Army-Amateur Radio System in 1926 when he was the first director of the Hudson Division of the American Radio Relay League. In 1929, when the original AARS affiliation plan between radio amateurs and the Signal Corps was revised, Dr. Dunn was appointed Chief Radio Aide to the Chief Signal Officer of the Army by Major General George S. Gibbs, then the CSO, and served in that capacity until 1934 when the pressure of his professional duties prevented his continuing. In 1920 he accepted a commission as a captain in the Dental Corps Reserve and in 1925 was transferred to the Signal Corps Reserve, where he was assigned to the 302nd Signal Battalion. He was promoted to major in 1930. Major Dunn later served as commanding officer of this reserve unit. In addition to his radio amateur experience he has also been an aviation enthusiast since 1928 and holds a commercial pilot's license. He often flies his own airplane. In his professional work, Dr. Dunn is now consulting oral surgeon of Kings County Hospital in Brooklyn and Mary Immaculate Hospital in Jamaica, N. Y. He is chairman of the military affairs committee, Second District Dental Society, a fellow in the American College of Dentists and a member of the Institute of Radio Engineers.

(Continued on page 36)

Dr. Lawrence J. Dunn, W2CLA/WLMD, receiving from Major General J. O. Murborgne, the Chief Signal Officer, his certificate of appointment as Chief Radio Aide. The spectators are Major David Talley, Liaison Officer of AARS; Alonzo O. Bliss, W4ES/WLRG, Fourth Corps Area Radio Aide; and George W. Bailey, W1KH, ARRL President. (Signal Corps photo.)





ON THE ULTRA HIGHS



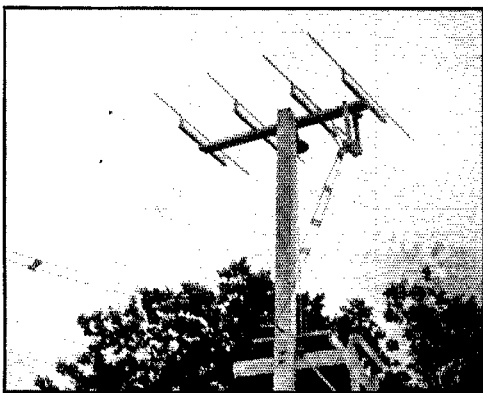
CONDUCTED BY E. P. TILTON,* W1HDQ

Most of us in the east have spent a lot of time envying the California W6's and their unique geographical situation which produces an almost continuous temperature inversion along the ideally-curved coast of Southern California, as reflected in their seemingly unbreakable hold on the DX records for 112 and 224 Mc. The W6's have gone in for portable work on 2½ to a greater extent than has been in evidence in any other section of the country until recently, and the abundance of high mountain tops which are accessible by car have resulted in many contacts beyond the 200-mile mark.

There is one spot in New England which is just as favorable as to topography, but it remained for a New York amateur to prove its virtues. On August 21st, Bill Gamache, W2MPY, of Montrose, N. Y., journeyed to the top of Mt. Katahdin, 5267-foot elevation near Millinocket, Maine, and with the aid of 20 watts to an HY-75, a 6-element array, and one of the best temperature inversions in the history of work on 112 Mc., worked a string of stations that will give the California boys some real marks to shoot at!

Starting at 6:20 p.m., Bill contacted the following W1's in rapid succession: JWU, LMU, LFA, JWB/1, NJL, LZB, MBI, HOH, LFI/1, and MWH, all over 250 miles! At 8:35 contact was established with WIBHL, Hopkinton, Mass., a distance of 295 miles. Around this time W1JFF, Newport, R. I., was in a "round-table" QSO with W1LZB, Boston, W1NBU, Providence, W2ADW, East Quogue, L. I., W2LXQ, Fisher's Island, N. Y., W1KLJ, Bristol, Conn., and W1MRF, Bridgeport, Conn. W1LZB attempted to hook up

* 329 Central St., Springfield, Mass.



W9CCY, Council Bluffs, Iowa, uses a 4-element horizontal array for 112 Mc.

this widespread gang with W2MPY/1, but by this time LZB had faded out up at Katahdin. At 8:50, W1JFF heard W2MPY/1 report this fact, so Fred called him, reporting that he was S6-7. W2MPY/1 replied that JFF was pounding in up in Maine, thus setting another DX record—Millinocket, Maine, to Newport, R. I., a distance of 335 miles! W2MPY/1 also heard W2ADW, 400 miles, but unfortunately no contact was established.

This was a perfect example of the "sunset inversion" which occurs so frequently along the shores of all large bodies of water in warm weather. Coupled with this was a nice air-mass boundary extending along the North Atlantic states, the result of a large storm area advancing from the Middle West. As is usually the case under such conditions, things went nearly dead between 9 and 10 p.m., but came back strong around 10:30. Thereupon, the DX scramble, this time between the W1's and New York, New Jersey, and Pennsylvania stations, started anew. New records for home-to-home DX were made and broken as W2LXO, West Orange, W3HOH, Bernardsville, W2FJQ, South River, and W2BYM, Lakehurst, N. J., and many Long Island W2's began to work up into Massachusetts; first to your conductor (very much agog) and then to W1BJE, Westport Harbor, Mass., W1JFF, W1KOE, W1JWB/1, Mt. Wachusett, Mass., and W1LZB at Boston. Here are a few of the longest contacts: W2BYM-W1LZB, 240 miles; W2FJQ-W1LZB, 220 miles; W3HOH-W1JWB/1, 200 miles. There were many more almost equally phenomenal. Many of these were repeated the following night, when conditions were almost equally good. Your conductor worked around thirty W2's, some of them running as low as six watts, yet covering the 100 to 160 miles with amazing signals!

This condition prevailed, in varying degrees, for the better part of a week, with signals reaching tremendous strengths practically every night. In the early morning of August 25th, W1KOE, Wakefield, R. I., worked a W3 (call unknown to us) in Germantown, Pa., a distance of 230 miles. It is significant that, with the exception of the work of W2MPY/1, all this DX was worked from home stations, most of them not exceptionally well situated as to altitude. In most cases the power input was under 100 watts.

During the first part of the month of August plenty of skip-DX was worked on Five, with W8CIR reporting some aurora work on August 26th. When skip ceased to appear the activity, as always, took a big drop. It is unfortunate that

this quiet period comes at the time of year when inversion bending is at its very best. Five-meter enthusiasts would do well to keep their perspective, and realize that skip-DX, most thrilling sport that it is, is merely a spicy sauce which adds flavor to the more solid fare of day-to-day effort in extending the local horizons. Instead of dropping Five until next spring, now is the time to get about building up local activity. Arrange skeds with other enthusiasts within a 100-mile range. Get to work on those antennas and make them really perform. Line up the fellows in your part of the country in a sure-fire relay circuit — and try out this circuit regularly. Most important of all, cultivate the habit of putting the rig actually on the air on a certain definite schedule — instead of merely listening across the band. Don't wait for activity — make it! You'll be surprised to find how often it is possible to work out to 200 miles and more, when you're really trying!

HERE AND THERE:

It is probably news to very few, by now, that W3OR, Essington, Pa., worked a station signing K7GNN on the night of June 28th. This was one of the summer's best multiple-hop sessions; it was soon learned that K7GNN was the brother of W7FLQ, one of our most enthusiastic 56-Mc. W7's; a W9 heard a K6; yes, this one had all the makings of a new DX record for Five. But now comes the sad story, straight from K7GNN: he hasn't been on Five since 1937, nor on any band since April 5th! Thus the story of the century becomes just a hoax, the "humor" of which all true amateurs fail to understand. We hope Alan finds out the culprit — we'll be glad to assist in a bit of tarring and feathering!

Fellows in the Middle West may have wondered why all their messages addressed to East Coast stations never got through to their destinations in the U.H.F. Roundup of August 9th and 10th. There were two very good reasons, both of them hamfests: the Delaware Valley affair at Trenton, N. J., drawing u.h.f. enthusiasts from far and wide, and the annual U.H.F. Hamboree at Lake Quinsigamond, Shrewsbury, Mass. Both gatherings were big successes — but they left awful holes in our relay routes!

W1MEP/1 has added three more W9's to the list of workers on Five. CLH, Roselle; ARN, Bartonville and PK, Lyons, all of Illinois, were worked on July 29th. Chet wonders what was wrong with all the other W9 states, as five of his six W9's worked are in Illinois! It will be good news to 112-Mc. enthusiasts that Chet can now run his HY-114 as an oscillator on 2½. Vermont contacts on 2½ coming up — watch the high end of the band!

W3HDJ, Delanco, N. J., lost his 50-foot tower early in August and now has only a low horizontal for Five. Ernie is putting the finishing touches on a mobile job to keep in touch with the band while away on business trips.

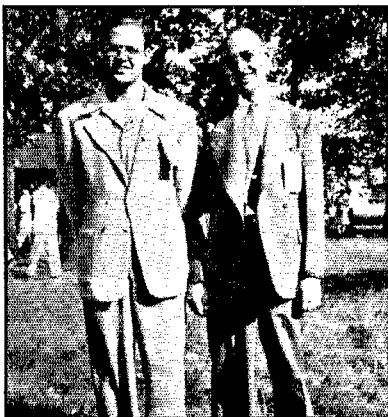
W5FSC, Huntsville, Texas, is finding the going rather tough these days. Bud missed a number of the better openings during the summer, and now he has nothing but ignition to listen to. How about some help, in the form of skeds, from W5DNN at Austin and W5BHO, W5EEX, and others in Houston? Both these points should be workable from Huntsville. Let's keep those signals on the band all the year through!

W5HYT, Amarillo, Texas, worked skip-DX on 25 days between June 1st and July 28th, making 295 contacts in all call areas and 22 states. John says that this work on Five has made 1941 the most enjoyable year in his 17 years of amateur operation. Let's hope that, with W5WX, W5CHG and others in that area active, enough interest will be stirred up to keep activity on the band during the off season, too.

Most of us have our pet "signs" for forecasting band open-

ings. W6OVK watches the sky for cirrus cloud formations. Jim first noted the coincidence of cirrus and skip on Five last year, and during the 1941 season kept a complete log of cloud conditions from May 9th to August 3rd. During this period there were 26 clear days, and of these only 7 showed any sign of band openings, and these openings were principally to W7 (north). Heavy cirrus formations were noted on 14 days, and on only three of these days did the band fail to open! In 83 days of observation the band was open 37 out of 57 days during which cirrus clouds were present in the Arizona sky. Has anyone else any weather-skip observations?

W6QAP reports that he had to aim his beam north to hear W7GBI while the latter was working W6SLO on July 27th. SLO aimed his array northeast for maximum signal strength at this time. At first the directivity of QAP's array was extremely sharp, but as W7GBI was fading out he was audible with the array in any position. If this



Everyone who's ever worked DX on Five knows these two. Vince and Robbie, W9ZJB and W4EDD, snapped at the Trenton, N. J., Hamfest by W2AMJ.

proves anything, it is that one should not take anything for granted (especially the directivity of one's beam) in working skip-DX. SLO and QAP are only about four miles apart.

With the major period of skip-DX over for the year, W6SLO is concentrating on some new gear, including a complete f.m. receiver using the new 9000-series tubes. A good example, Neal — why drop work on Five just because the band won't be open every other night for a while? Neal expects to give f.m. a whirl on 112, 56, and 28 Mc. during the coming winter.

W7FDJ says this states-worked business isn't fair to the boys out west. Bill worked twelve this year, with Mich., (W8RKE, both vertical) Ill., N. Mex., S. Dak., and Wyo. being new ones. With states the size they are in the East, W7FDJ would probably be up in the twenties, by now.

Not too many of us have worked West Virginia, so new stations there are doubly welcome. W8JKN is on in Buckhannon, with an 815 at 40 watts, and a 4-element "W6QLZ Beam." W8ASI has gear under construction. Keep these boys in mind when turning those horizontal arrays, you Ohio and Pennsylvania W8's!

One evening recently, after the conclusion of a series of contacts with W9's (beam aimed west) your conductor was surprised to receive a call from W8PK, East Bloomfield, N. Y., about 250 miles to the west. This is the first time we have heard a W8 without the aid of skip, and it opens up interesting possibilities for a new relay route to the Middle West. W1MEP/1 heard W8PK at this time also. If W8RTW and some of the other fellows in central and western New York are interested, it would appear that some test schedules are in order. Volunteers?

W8BPQ, Cincinnati, writes that he and W9RBK, Newport, Ky., have regular contacts with W8NSS at

U.H.F. MARATHON

Call	Contacts Through August 15th			Score	States in 1941
	56	118	224		
W1AEP	107			1008	23
W1ATV	112	34		847	18
W1BCT	52	33		181	2
W1CGV	52			396	13
W1DJ	115	83		877	10
W1DLY	77			598	17
W1EHT	57			418	16
W1EKT	111			779	16
W1HDQ	232	88	4	2376	29
W1IJ	87	38		722	10
W1KIJ	196	79		1905	26
W1LFI	7	152		685	5
W1LLL	151	62		1613	25
W1LNU		76		239	2
W1LSN	87			750	13
W1MBS		235		904	3
W1MEP/1	44	1		394	9
W1NCQ	56			239	14
W2ADW	1	102		692	5
W2AMJ	181			1566	22
W2BYM	185	8		1563	27
W2COT	105	18		556	6
W2DZA		279	4	1042	5
W2FJQ	57	62		526	13
W2LAL	94	6		550	9
W2LXO		233		909	4
W2MGU		156		620	3
W2MLV	48	90		418	9
W2MQF		95		374	1
W2NSD		4		16	1
W2OEN ²		86		370	2
W3ABS	54			208	5
W3ACC	95	4		550	15
W3AXC	29	6		135	6
W3AXU	123	20		878	20
W3BZJ		206		1040	3
W3CGV	87	6		660	16
W3DJZ	45			386	14
W3LJU	58			277	10
W3HDI	81			680	16
W3HOH	98	230		1390	13
W3HIS	68			736	16
W3RL	23			288	9
W4FBH	67			706	17
W4FEN	33	2		292	12
W5AJG	150			1620	25
W5DYN	40			458	13
W5FSC	40			416	16
W5JGV	48			854	19
W6ANN	60	164		1471	14
W6BPT	9			121	5
W6CVK	77	8		1572	23
W6CQ	49			578	10
W6QKM	4	86	1	347	1
W6QLZ	56	7		897	16
W6SLO	60			1282	17
W8CIR	107	10		1800	24
W8KED	96	38		1144	16
W8KWL	15			170	10
W8MHM	2	20		145	1
W8QSS	57			645	16
W8EUB	54	12		550	11
W8TJD	33			423	12
W8UUY		10		136	1
W9AB	25			194	7
W9ANH	39			550	11
W9ARN	80			1007	21
W9BDL	79			1130	20
W9EGQ	17			72	9
W9FHS		24		87	2
W9LLM	79	31		818	15
W9PK	102	1		920	24
W9PNV	96			543	2
W9YKX	32			1084	24
W9ZHL	66			812	17

Sixth Period Winner: W2BYM, 676 points.
Seventh Period: W1KIJ leads with 461 points.

¹ Not eligible for award.
² Formerly W9AOE/2.

Dayton, Ohio. Since the installation of 4-element arrays of the W6QLZ type at W8BPQ and W9RBK, and a 3-element horizontal at W8NSS, these fellows now cover the whole territory from W8CIR, Aliquippa, Pa., to Indianapolis and Terre Haute. Looks like a sure-fire route through to St. Louis, at least, if W9's ANH, BDL, ZEL, and others, can get the Ozark Net into action. How about some advance effort to line up a continuous circuit for the Fall U.H.F. Relay, which is scheduled for November 1st and 2nd?

Most everyone knows of the proficiency of W9CJB with his camera — but there were 36 shots taken with his Leica at a recent hamfest which will never appear in *QST*. You've guessed it: George forgot the film!

Late summer conditions have been excellent for the boys around Terre Haute, Ind. W9ZHL reports that the stations up around Chicago, W9's PK, IOD, REX, LLM, and YLV, come in almost like locals, as do W9QCY at Ft. Wayne, and W9RBK, Newport, Ky. All these are 150 to 180 miles distant.

W9EGQ, Gary, Ind., says that the new Twin-AX Cable now on the market has an impedance of about 150 ohms, with a quarter-wave about three feet long — a likely substitute for Q-bars in $\frac{1}{4}$ -wave-spaced rotary arrays requiring flexible matching sections.

112 MC. AND UP

Your conductor has been spending a lot of time on 2½ of late. After two years of intermittent work on this band we have finally managed to be on deck when things were really hot. We are still somewhat amazed at the strength with which signals from 150 miles or more can pound in, even with very low power and the simplest sort of equipment. But we find the prospect not entirely pleasant, and we feel, with many others, that the present condition of the 112-Mc. band in the East does not reflect too much credit on the institution of amateur radio. There are many fine signals, both low- and high-powered, and some excellent pioneering work is being done on receivers and antennas for this band, but there are too many of us who let anything which will make a noise on the air suffice for a rig, and anything which will pull in a signal or two do for a receiver. We would be the last in the world to advocate the abandonment of simple equipment for 2½, but there are a few simple precautions we should all take to see that our equipment is functioning properly.

If you are using an oscillator, adjust it carefully. Watch the grid current (how many owners of oscillator rigs ever check this most important factor?) and antenna loading. Run your tubes at reasonable operating voltages and check for frequency drift. Be certain that you are getting upward modulation (see to it that your neon shows a good bright purple when modulating, not the orange color which is apt to denote a tendency to go out of oscillation when the audio is applied). Use only as much audio as is needed to produce a good solid signal when the carrier is down to S-4 or so at the other end. And in receiving, watch that plate voltage and keep it as low as possible, not only for reduction of radiation but for better operation as well. And as to the use of transceivers — all right if used with care (as to operating frequency and receiver interference) by mobile stations, but there is hardly any excuse for their use in home stations, particularly in thickly-populated areas. Let us not be content to be on 2½ merely because it is new, or simple, or cheap. Rather, let us develop this new territory in a manner in keeping with our usual standards. The Ultra-Highs can be great fun — let's not spoil any part of this fun by haphazard gear and thoughtless operating!

W1MDN has been working portable on Powwow Hill in Amesbury, Mass., with no unusual results until the evening of July 21st. On this date he was heard by James Lee of Alexandria Bay, N. Y., nearly 300 miles distant. Lee also heard another Boston W1 and some W8's. W1MDN noticed an aurora display that night, and several DX contacts
(Continued on page 80)

U.H.F. RECORDS

Two-way Work

- 56 Mc.: W1EYM-W6DNS, July 22nd, 1938 — 2500 miles.
- 112 Mc.: W2MPY/1-W1JFF, August 21, 1941 — 335 miles.
- 224 Mc.: W6IOJ/6-W6LFN/6, August 18, 1940 — 135 miles.
- 400 Mc.: W6IOJ/6-W6LFN/6, January 28, 1941 — 20 miles.

The ARRL-Red Cross Preparedness Test

BY J. A. MOSKEY,* W1JMY

COSPONSORED with the American Red Cross, the ARRL preparedness test was an unquestionable success. Held on April 4th-5th-6th, this widespread testing of our communications facilities, dedicated to perfecting the ability of amateur radio to serve the Red Cross at any time, in the event of earthquake, hurricane, fire, flood or defense emergency facing all or part of our country, convincingly demonstrated that we are thoroughly capable of providing a vastly effective traffic-handling organization in time of need. Emergency Coördinators, traffic handlers and hams all over the country gave an excellent account of themselves and showed remarkable organizing and operating ability in this history-making activity.

That a high degree of interest prevailed is indicated by the fact that 405 amateurs reported on the number of messages they handled over the air during the test period. In all, a total of 1829 messages were delivered to Red Cross. The Emergency Coördinators, whose duty it was to collect messages from the Red Cross chapters in their territory and see that they were placed for proper handling, did a splendid job and, along with those relaying the traffic, are to be highly commended for their conscientious efforts. Space does not permit us to mention the many instances of magnificent individual accomplishments. To all who took a constructive part in the test, our sincere congratulations and thanks.

Deliveries

The basic idea in relaying messages originating at the chapters and containing vital information was to direct them to one of three receiving points where headquarters offices of the Red Cross are located. Messages in the western part of the country were routed to San Francisco, in the central states to St. Louis and in the East to National Headquarters at Washington, D. C.

At San Francisco 219 messages were delivered to the regional headquarters office of the ARC. This constituted a fine job on the part of the western gang since there were only a possible 354 chapters to file traffic and, as in cases elsewhere, some did not originate. Responsible to a large extent for this success was the preparatory work done by W6TI, SCM of the East Bay Section, ably assisted by W6OBJ and W6RBQ, in contacting chapters beforehand and lining up message routing to expedite forwarding the test traffic. In Southern California W6MQM similarly did good work. The San Francisco Net, SARO Club Net and the Central California Net

* Assistant to the Communications Manager.

AMERICAN RED CROSS NATIONAL HEADQUARTERS Washington, D. C.

Mr. George W. Bailey, President
American Radio Relay League
West Hartford, Connecticut

My dear Mr. Bailey:

I should like to express to you and to the members of your organization throughout the country, the sincere appreciation of the American Red Cross for the fine coöperation and performance in the recent test drill of emergency communication facilities of the American Radio Relay League.

The messages received from over 1700 Chapters indicated the attendance of more than 3000 delegates at our National Convention and, needless to say, this advance information was of great value to us in our planning for what proved to be our largest Convention, with a total attendance of more than 5000.

More important than this, however, the drill gave practical evidence of the efficiency of the amateurs and the completeness of their nation-wide organization. It is a source of great satisfaction to know that their services are always available to the Red Cross in time of disaster.

Sincerely yours,
Norman H. Davis,
Chairman

gathered traffic, routing it to W6RBQ in S. F. The Mission Trail Net and the American Legion Net rendered valuable service in keeping things humming. W6ZM acted as key station for these systems and held all messages for collection by W6TI and W6EY who made official delivery to the R. C. Hq. officials. Likewise, W6ONU in Nevada was key station for northern traffic which he forwarded to ZM.

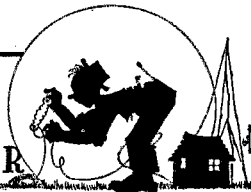
From the central portion of the country 745 messages reached St. Louis. Members of the Missouri ARRL and AARS Nets, ARRL trunk lines and the Illinois Net pushed messages along to this point in an efficient manner. A glance at the FB individual totals appearing elsewhere in this article will give some idea of the enthusiasm with which the Midwest amateurs participated. The relay work of W9AEJ and W9ILH was particularly outstanding; each of these operators handled 101 messages!

The Washington, D. C., Radio Club as always turned in a noteworthy performance. A plan was devised whereby the city was divided into eight separate districts, each having a coördinating captain who was responsible for organizing his own particular district and for checking and de-

(Continued on page 59)



HINTS AND KINKS FOR THE EXPERIMENTER



FEEDER TUNING

FIG. 1 shows a rearrangement of the usual series-parallel feeder-tuning system which will often help when it is found that the parallel condenser doesn't have quite enough spacing and arcs over.

With the antenna coil plugged in at *A*, we have the usual circuit which is still used for series tuning. When the antenna coil is plugged in at *B*, however, the series condensers are now connected in series with the parallel condenser to decrease the voltage across the latter. The extent of the reduction in voltage across the parallel condenser will depend upon the setting of the series condensers. When each of their capacities is the same as that of the parallel condenser, the total voltage across the coil will divide equally, so that only one third of the voltage will appear across the parallel condenser.

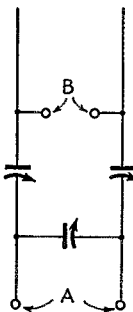


Fig. 1 — W3FEG's arrangement for feeder tuning. Series tuning is obtained with coil plugged in at *A*, parallel tuning with coil plugged in at *B*.

Of course, it may not be possible to reduce the voltage to this extent, because the series condensers usually have smaller spacing than the parallel condenser and, therefore, will arc over more readily. Nevertheless, many cases will be found where the reduction is sufficient to make operation possible without buying a higher-voltage condenser.

In practice, it is usually possible to find a fixed setting for the series condensers for each band, so that all tuning may be done with the parallel condenser, once the series condensers have been set. — *Edward R. Hill, W3FEG*

SPEECH AMPLIFIER OR MODULATOR AS AUDIO OSCILLATOR FOR I.C.W.

THE substitution of a buzzer for a carbon microphone to effect i.c.w. operation is a simple

and effective idea, but introduces the often uncertain mechanical character of small buzzers. Because of this, today's commercial and military phone-c.w.-i.c.w. equipments usually employ an electronic method of generating i.c.w. modulating tones. Suitable switch contacts are often arranged to connect a feedback capacitor from plate to grid of a speech-amplifier or modulator tube to cause such amplifier or modulator tube to function as an audio frequency oscillator for i.c.w. tone generation. This system is simple, free of the uncertain operating habits of small buzzers, and gives some choice of audio tone through selection of a suitable value of feedback capacitor, which also serves to tune the audio oscillator.

Assuming a radiotelephone transmitter having a single modulator, or earlier speech amplifier tube, associated with a carbon microphone transformer and an inductive plate load, such as is provided by a modulation or output transformer or choke. To convert this into an audio oscillator for i.c.w. tone generation, it is only necessary to increase the tube's grid-plate capacity to promote oscillation. Usually a s.p.s.t. switch, which may be one section of a gang switch, will nicely serve to connect a feedback capacitor of value chosen to give the desired audio modulating tone between the modulator tube's grid and plate. Usually a value somewhere between 0.001 and 0.05 μ f. will be satisfactory.

Thus, the price of i.c.w. operation need not be more than one small capacitor and a s.p.s.t. switch for the amateur transmitter having one audio stage with inductive grid and plate circuit elements. Sticking buzzer contacts and extra microphone battery power consumption are done away with entirely. — *McMurdo Silver*

FREQUENCY EQUALIZER FOR CRYSTAL MIKES

AFTER hearing the Astatic E4P phonograph pick-up tone equalizer the other day, I was struck with the ready adaptability of the unit to all existing ham 'phone rigs using crystal microphones.

After looking at the frequency-response curves of the unit, its use under varying communication conditions will be appreciated. The control has four positions — "bass," "medium," "high-fidelity" and "off." While the "bass" position has little advantage for communication purposes,

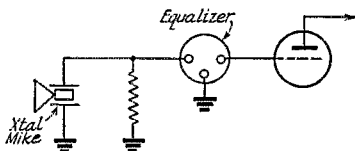


Fig. 2 — Connections of phono pick-up equalizer for varying frequency response of crystal mike.

the other three positions are worth the price of the unit. In the "medium" position, you get a very pleasant and natural response from your amplifier-modulator, with the medium lows coming through — a good position for excellent fidelity when chewing the rag locally.

The real beauty of the unit when used in communications, however, is its nice flat frequency response from 300 to 3000 cycles. This cuts off the power-consuming highs and lows and transmits a razor-sharp, QRM-cutting signal. In tests, I have been just about audible through QRM with the control in the "medium" position. When I switch to the "high-fidelity" position, the modulation comes up to nice crisp intelligible speech.

Since the E4P works into a 5-megohm load, it is a simple matter to hook it into any existing crystal-mike input. Shielded-braid cable should be used for all leads to the unit and don't forget to ground the outside braid. Connections are shown in Fig. 2. — *Louis J. Frenkel, Jr., W2MWI*

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40-METER ZEPP ON 160

IN CONNECTION with the expected exodus from 80 meters to 160 when the air services take over portions of the former, it may be of value to many amateurs to know of a good and simple way to get a forty-meter Zepp to load on 160. This is a common type of antenna and I imagine many hams ponder over loading it on 160.

I have used such an antenna with excellent results on 160. With but 50 watts, I have often contacted the east coast on 160 c.w. I simply tune the antenna in parallel as on 20 and 10 meters. It has a 66-foot flat top and 33-foot feeders, end fed. With feeders of very different lengths, the system does not work so well, but any Zepp cut to within twenty percent of this length should be easily loaded. At 500 volts, I can load my 807 well above the rated 100 ma. The tuning condenser has a capacity of 200 $\mu\text{mfd.}$, while the coil consists of 38 turns $1\frac{1}{2}$ -in. diameter, $1\frac{1}{2}$ -in. long.

— *Bill Skinker, W9AEJ*

—♦♦♦—

INTERFERENCE FROM A.C.-D.C. RECEIVERS

AN UNSUSPECTED source of line interference, which I recently discovered, may be of interest to fellow readers of *QST*. This noise, which sounded as if it might be caused by a defective motor, ruined most of the b.c. band and could

be heard also on high frequencies. Imagine my surprise when I searched the vicinity and there was not a motor to be found! Further investigation, however, revealed a neighbor's radio as the source. A check of the radio showed all parts in good condition, but it was noticed that noise would stop if the antenna of my neighbor's radio was disconnected. In checking his antenna, I found the lightning arrestor was burned out. It was causing a slow leak of current to ground from the "hot" chassis of this a.c.-d.c.-type radio. The radio did not have to be turned on to cause this noise, since the chassis can be made "hot" through the connection to the 110 line via the tube heaters when the switch is turned off.

I hope this will be a help to someone.

— *Lucius Smith, W5FXO*

Red Cross Test

(Continued from page 57)

livering the messages received. This method functioned with excellent efficiency. Twenty-five stations accounted for 865 messages which the club had the pleasure of presenting directly to Mr. Norman Davis, National Chairman of the Red Cross:

Highlights and Comments

Reports from participating amateurs were received from all states, Porto Rico and Alaska. . . . The Emergency Coördinator's Committee of the City of Philadelphia set up a portable station on Rebyrn Plaza, City Hall, Philadelphia, where Miss Frances Rice, W3AKB, transmitted to another YL, W3CDQ, at Washington, D. C. The message sent was received at this point from R. C. headquarters via 56 Mc. . . . W9VGC, W9YFJ, W9WYX (working in front of chapter building), in Colorado, and W9CTQ in Iowa operated portable from locations afield. . . . "During QSO with W4FDT learned he got out of sick bed with temperature over 100 degrees to push Red Cross traffic through and he isn't so young either. That's ham radio for you." — *W1WI*. . . . The bulk of traffic was handled on 3.5- and 7-Mc. c.w. with considerable amounts handled on 1.75- and 14-Mc. 'phone. . . . W3AQN used emergency power (gas-driven generator) and had as guests officials of the local R. C. to see the station in operation. . . . "It was a new thrill from ham radio and I will keep my station ready at all times in case of a real emergency." — *W9RXC*. . . . W8AIZ, president of the Wayne County Chapter of the Michigan Amateur Radio Emergency Council, kept his station, manned by twelve operators, on the air continuously from 5 P.M. April 4th until 11:59 P.M. April 6th. . . . W8RUE was set up on 56 Mc. at the Pittsburgh, Pa., R. C. headquarters and transmitted the test message to W8BTQ, W8KWA and W8CLS operated portable-mobile and tested from various sections of the city considered as danger spots in time of flood. . . . W6OBJ and W6RBQ sent

out 150 letters to R. C. chapters in preparation for the test. . . . W3HUM, W3BWT, W6RBQ, W9AEJ and W9ILH each handled over 100 messages. . . . "Let's have more activities of this kind." — W9KCO.

— — — —

The individual total of each traffic handling participant who submitted a report is indicated below. To each of these has been sent a souvenir acknowledgment of their part in the first facilities test conducted by ARRL and dedicated to the American Red Cross.

First District: W1DY 28; W1P 19; W1KH 9; W1TD 5; W1APA, W1GB, W1E1 4; W1DJC, W1EUL, W1FAP, W1MJU, W1MRK 3; W1AUN, W1BHM, W1BVR, W1GKJ, W1ITI, W1KMY, W1MMI 2; W1BBN, W1BEH, W1BFA, W1CSX, W1CUZ, W1HDJ, W1HWY, W1IFS, W1LGY, W1LML, W1LOA, W1LPE, W1MBQ, W1MIJK, W1MLT, W1MMM, W1ON, W1TO 1; W1AW 34; W1TS 17; W1INF 9; W1BDI 2.

Second District: W2SC 13; W2JU 10; W2LR 8; W2BGV 7; W2AJY 5; W2GP 4; W2CGG, W2JZX, W2KRA 3; W2IGN, W2LYX 2; W2AER, W2BGO, W2BNU, W2FDL, W2HFN, W2KMK, W2LGK, W2LMN, W2LYC, W2MHJ 1.

Third District: W3HUM 134; W3BWT 117; W8JT/3 91; W3ECP 64; W3BKZ 39; W3FFN 39; W3CDQ 35; W3CYO 33; W3FSP 16; W3ADE 13; W3AVJ, W3BXE 10; W3AIJ, W3GQW, W3VP 9; W3BAQ, W3DLC, W3FE 7; W3AQN 6; W3AKB, W3CWG, W3FHF, W3HBE, W3IWM 5; W3AOC, W3IHZ, W3LLK 4; W3EWR, W3FGR, W3HFE 3; W3AQV, W3FMC, W3HXA, W3IP, W3ICQ, W3IWF 2; W3CDY, W3CFV, W3EBC, W3FMP, W3GGX, W3HAZ, W3IDZ, W3IKI, W3IQS, W3JGS 1.

Fourth District: W4PL 34; W4BOW 27; W4BLL 25; W4OC 24; W4BMH 15; W4AXP 12; W4FPN 10; W4DGV 9; W4ABT, W4FGU 6; W4BAG, W4FDT 5; W4BYF, W4GNE, W4PGJ 4; W4ACZ, W4FHE 3; W4FRQ, W4GRL 2; K4HEB, W4CVX, W4IP, W4MS, W4RO 1.

Fifth District: W5EGE 33; W5DWW 25; W5EKV 18; W5BZG 14; W5IHC 10; W5BUV 9; W5CEZ 7; W5JIC 6; W5KC 5; W5DGB, W5FNA, W5HDH, W5JHW 3; W5ALV, W5DIG, W5DPI, W5FFK 2; W5AQE, W5ECT, W5GGX, W5HLK, W5HMZ, W5HSV, W5HZN, W5IOB, W5IVG, W5IZZ, W5JJA 1.

Sixth District: W6RBQ 115; W6ZM 44; W6ONU, W6OBJ 11; W6BJB 7; W6BMC 6; W6PFH 5; W6RWW 4; W6AXN 3; W6DYQ, W6GBN, W6HYR, W6MYT 2; W6APG, W6BAM, W6DHS, W6EY, W6JQB, W6KTO, W6QJL, W6QVY, W6QXL 1.

Seventh District: W7HZG 12; W7GJC 6; W7HI 5; W7BCE, W7DSS, W7DVK, W7NH 4; W7FVK, W7HRN, W7RT 3; W7BVB, W7WB, W7FTA, W7GVH 2; K7FCH, W7DQX, W7FPN, W7HAL, W7HUX, W7HZE, W7MQ 1.

Eighth District: W8JXM 15; W8JIW 13; W8KWA 11; W8AIZ, W8OKC, W8OVB, W8RKL 8; W8CBI 7; W8DHB, W8OXO, W8RYP, W8TOJ 5; W8LKV, W8OXH, W8QBO, W8TSF, W8UNH, W8UXT 4; W8ARO, W8TEP, W8UPH 3; W8BFB, W8NZI, W8RPZ, W8TDY, W8UW, W8UXS 2; W8AMS, W8AOE, W8AQE, W8AVH, W8BOZ, W8CKM, W8DS, W8ECX, W8EGI, W8EGT, W8EUN, W8GV, W8GWT, W8HKU, W8IAE, W8JTW, W8KHO, W8KXA, W8LIY, W8MM, W8MWL, W8NVC, W8PIK, W8PNJ, W8PP, W8PTE, W8PZA, W8PZS, W8RMH, W8SFI, W8SJV, W8SSW, W8SZW, W8TAY, W8TPZ, W8TQT, W8UDE, W8UQM, W8VEY 1.

Ninth District: W9AEJ, W9ILH 101; W9BLL 87; W9QMD 70; W9ZGX 57; W9NDA 53; W9CGX 48; W9EFC 47; W9JMG 34; W9BAZ 31; W9BBB 27; W9ZVJ 22; W9DUX 20; W9KIK 18; W9LTV 15; W9QLZ 12; W9WMI 12; W9GKS 11; W9DUD, W9NCZ 10; W9KPI, W9SLW, W9SVH, W9ZWL 9; W9BQZ 3; W9BBS, W9HVT, W9NVJ 7; W9JTX, W9KBL, W9UQT, W9WUU 6; W9AIC, W9DOK, W9EEY, W9OUD, W9QOQ, W9QVY, W9TZX, W9VEE 5; W9DZC, W9EER, W9GBZ,

W9HKI, W9HOA, W9NYM 4; W9ADJ, W9AIG, W9BLK, W9DBD, W9EDQ, W9ESL, W9FYM, W9HWH, W9KLC, W9QAQ, W9SZL, W9WXL, W9ZVO, W9ZYS 3; W9FEO, W9JIM, W9JNC, W9JSW, W9JUQ, W9JWT, W9MYG, W9OCO, W9PAH, W9PHL, W9QGF, W9RMI, W9WVQ, W9YF 2; W9AJT, W9AUB, W9BBN, W9CGR, W9DCW, W9DEI, W9DTE, W9DUN, W9EHT, W9EMQ, W9EVT, W9EWO, W9FAJ, W9FAQ, W9FDL, W9FLZ, W9FPB, W9GCW, W9GKO, W9GLA, W9GLK, W9GWS, W9HGK, W9HIC, W9HUX, W9HYQ, W9IWT, W9IXR, W9IYJ, W9IYZ, W9JMB, W9JXM, W9KCO, W9KXK, W9LLE, W9MCX, W9MGD, W9NBL, W9NGQ, W9NIU, W9NLV, W9NZZ, W9OUH, W9OUU, W9PBD, W9PLJ, W9PWP, W9QMF, W9QYL, W9RAK, W9RXC, W9TGG, W9TGG, W9VAF, W9VCO, W9VOD, W9VWB, W9VYX, W9YKR, W9YKY, W9YXP, W9YZK, W9ZNO 1.

In the Services

(Continued from page 40)

laghan, 5NN, and Lantz, 5AMX, are civilian radio instructors at Camp Wallace, Texas. Pvt. Reed, 9MIU, at Camp Forrest, Tenn., operates aboard the 168th F.A. communications officer's "jeep" car. Staff Sgt. O'Phelan, 2JCA, now a radio instructor of the 102nd Obsn. Sqdn., Ft. McClellan, Ala., has more than 25 years of military service behind him! Pvt. Eddy, 2AJZ, operates with the 258th F.A., at Madison Barracks, N. Y. Communications chief of the 157th F.A., is Tech. Sgt. Giles, 3DKB, Ft. Dix, N. J. Four selectees at Ft. Knox radio school are Pvs. Spielberger, 6OCN; Bowman, 8KBX; Schlosser, 8FYM, and McMurray, 7GXN. Pvt. Hampton operates 3HZK for trainee traffic at Ft. Benning, Ga. Pvt. Bundle finds his AARS work from 9YJC was good training for present radio operating duties with the 98th F.A. Bn.

SIGNAL CORPS

IN THE Signal Corps, hams have plenty of company! In the First Sig. Svc. Co., Alaska Communications System, are: Sunden, 7GBF; Cebring, 7CZY; Vaughn, 7GIN; Davis, 7DIS; Welcker, 7GVV; Votaw, 7WY; Gaffney, 7FOS; Pauley, 7ENG; Bowdish, 7FVN; Groff, 7FQG, and Henson, 6NKR; many of this gang acquired operating skill in the Washington ORS nets. Pvt. Butler, 9TTJ, is at the post radio station at Ft. Brady, Mich. Pvt. Constantino, 3IOW, operates in an aircraft-warning net in the Canal Zone. Lt. Vogel, 2BXM, finds his radio work at Ft. Monmouth extremely interesting.

It looks as though the Fifth Corps Area AARS net has taken over the Signal Corps; we've reported 8GZ and 8AV at Camp Shelby, and now find Sgt. Klein, 8UW, and Mstr. Sgt. Havens, 8ISK, there while Lt. Whysall, 8CMI, is at Ft. Benning, Ga. More AARS "grads" are Mstr. Sgt. Huggins, 4CCJ, instructor at Ft. Benning; Pfc. Wojtkiewicz, 3GJY, op at Baltimore's WVG, and Pvt. Snooks, 8HCS, op at WTY, Ft. Knox, Ky. Students at the 46th Sig. Co. radio school include Pvs. Ross, 2GLY; Bisulca, 2CON; Munson, 9FPG, and Lizotti, 9JKR. In key positions of the 40th Sig. Co., Camp San Luis Obispo, Cal., we find Lt. Kruse, 6JIM; Staff Sgts. Ross, 6NYZ; Franklin, 6JVG, and Pvs. Johnson, 6MZQ, and West, 6QLO. George Bonadio, 8OMM, is attending the Utica, N. Y., civilian signal school in preparation for a commission.

Pvt. Beverage, 1MGP, is stationed at the Manchester, N. H., air base with the 30th Sig. Platoon. In the 56th Sig. Bn., Ft. Jackson, S. C., SCM Ferguson reports Lt. Miller, 4BKN; Sgts. Eannelli, 4HNP; Latham, 9RGO; Hunsucker, 4HEV, and selectee Pvs. Lanzoni, 3GBC; Gebhard, 2GWJ; Demarest, 2IIQ; Klingener, 2GXC, and Johnson, 2MWA. The gang operate 4HEV on all bands, always on the lookout for traffic. Recent students at the enlisted radio operators course at Ft. Benning, Ga., included selectees Stannard, 1DDP; Godfrey, 1FRU; Coombs, 1HSS; Hornak, 1KQT; Grzesik, 1KXJ; Prime, 1MAR; Hampton, 2GJC; Acunto, 2HGP; Sakai, 2KJF; Eckstadt, 2LDI; Greenwood, 3JEJ; Kline, 3LB; Thomas, 4EAV; Webster, 8HAC; Moody, 8EEK; Gloystein, 8PBU; Wolpin, 8RIW; Chozsik, 8UWI;

(Continued on page 74)



CORRESPONDENCE FROM MEMBERS

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

ON THE FCC NOTICE

P. O. Box 550, Little Rock, Ark.

Editor, *QST*:

The recent action of the FCC allocating certain frequencies in the amateur bands for the use of government services will, no doubt, cause some rumbling in the ranks but I think it will be only selfish and short-sighted amateurs who will object.

What part the ARRL representatives had in this matter may not be known, but after studying the entire proposed plan I think it is the best thing that could have been done . . . without undue oppression of any one group. After all, the United States is the only major country permitting amateur operation without unreasonable restriction. The government could have closed us all down and taken over all frequencies.

I also noticed that the purpose for which the new frequencies will be used is a purpose that will naturally cease to exist at the termination of the present national emergency. That looks like a well-planned effort on somebody's part. Furthermore, it will pacify the hams who have been screaming for years for a 40-meter 'phone band. Now they have a chance to see what they can do, but they should beware of where their harmonics fall!

Therefore, if any ARRL representatives had a hand in working out this arrangement, let's give them bouquets *now* while they are alive, rather than wait until their names appear in Silent Keys. . . . Let's be thankful we do not have any more restrictions than we now have.

— Lester Harlow, W6CVO

ROCKFORD ILL.

EDITOR *QST*

APPRECIATE ALL THAT ARRL IS DOING TO MAKE IT POSSIBLE FOR AMATEURS TO CONTINUE ACTIVITIES DURING PRESENT EMERGENCY STOP AM PREPARING IMMEDIATELY FOR NEW ALLOCATIONS STOP KEEP UP THE GOOD WORK

JAMES C MILLER W9NTV

Editor's Note. — To the amateurs who have written pledging their support in this matter, our thanks. That the amateur body is overwhelmingly loyal in its support of the defense program is shown by the fact that over 95% of the letters received expressed approval of the temporary loan of frequencies for the use of the Air Corps.

FACTS BEFORE JUDGMENT

1824 Barker, Lawrence, Kans.

Editor, *QST*:

Words would hardly describe my first reaction to the announcement of the temporary frequency changes.

The first I heard of the changes was one amateur sending a WIAW broadcast on the 80-meter c.w. band. The sending station's signals were very weak and crashes of QRN were terrific. The net result was that I copied only parts of the broadcast.

From the part that I did copy I made out that according to a new FCC ruling we were to have parts of our different bands taken away from time to time and that we would lose all of our 75-meter 'phone band.

My first thought was, "What is wrong with ARRL that

they would sit there and let our bands slip away without a struggle?" I was so worked up I was ready to drop my League membership and all ARRL activities. . . .

Then I had a chance to get a good solid copy of the broadcast. On top of that there came the RM Bulletin explaining the temporary changes in full. Lo and behold! I was a changed person instantly. . . . I was ready to shout with joy and had only praise for the ARRL. I went back to working the nets with a punch. Gee! To think that I was so little as to pass judgment without knowing the facts. That all of the time the changes to be made were only of a temporary nature and only to help the defense program of our grand U. S. A. . . .

No matter what happens, in times like these we should never pass judgment until we know the true facts and see the thing from all angles.

Now, I think all amateur radio operators should be happy and proud that we can give parts of our frequencies to the defense of this great country of ours.

Let's make our motto: "The League of, by and for the radio amateur — the radio amateur of, by and for this grand old U.S.A. of ours."

Facts before judgment, please. — O. H. Baker, W9YBQ

THE ISOLATIONIST AMATEUR

50 Albion St., Lawrence, Mass.

Editor, *QST*:

Ladies and gentlemen, during the past few months this glorious country of ours has witnessed a marvelous exhibition of the real, non-flag-waving, Tin-Pan-Alley-less patriotism of the American amateur radio operator. While this writer can lay no claim to statistical proof, a fair guess would place the amateurs high in the batting averages of those serving Uncle Sam in one form or another. But there is one peculiar individual whose viewpoint prompted this article. I call him the isolationist amateur.

This type of operator is either, (a) entirely ignorant of the precious privilege of holding a ticket and the valiant, never-ending struggle of his legal representatives to perpetuate ham radio, or, (b) he just doesn't give a continental darn for anything or anybody but himself.

When you meet up with him, you will recognize him at once. His economic circumstances will not give you a clue, nor will his technical or operating ability. But his opinions, which he will gladly babble into your aching ears for hours, should reveal his identity. His brilliant analysis of the day's news would run something like this: "I see the government is trying to rope the hams in again. Well, they can count me out. I'm no sucker. I bet the League is cooking this stuff up. Sure, that bunch in Hartford is always fumbling the ball. The League is nothing but a money-making racket, anyway. Guess I'll head for the shack and see what's doin' on 40." Let us be charitable, friends. The isolationist amateur is entitled to his opinions. But if he thinks amateur radio could flourish without a formidable organization to back it up, he needs special training in fact-finding.

At no time in the history of amateur radio could the American amateur be more thankful for the American Radio Relay League than at present. The League is now and has always been in an excellent position to guard the destinies of all amateurs, League members or otherwise. To the doubting Thomases I would say, do a little research work. Study the internal machinations of Washington and world politics. Make a sincere effort to obtain all the information that

(Continued on page 76)



F. E. HANDY, WIBDI, Communications Mgr.

J. A. MOSKEY, WJMY, Asst. to the Coms. Mgr.

More Amateurs Suspended. Since our report on this painful subject in August *QST*, the operating privileges of eighteen additional licensed amateurs have been suspended by the Federal Communications Commission. The suspensions of 60 days to a full year concern operators in states from one coast to the other. There is no magic location in which irresponsible operators can feel safe from the long arm of the FCC monitoring service. All good amateurs will be glad to see this minority that endangers the reputation of the whole fraternity properly penalized for violating regulations and safeguards set up for the normal course of operating or for the duration of the national emergency.

Eleven of the operator suspensions were "because of communication with a station located in a foreign country in violation of Order No. 72." The other suspensions cover a variety of things that all amateurs should be careful about. One of the longer suspensions was "for transmitting unidentified signals and correspondence in violation of the Communications Act and the regulations of the Commission." This emphasizes the need for careful observance by every amateur of the regulations that require the proper identification of ones own call identity with that of the correspondent station *both* at the beginning and termination of correspondence, and each ten minutes during long transmissions.

Other suspensions were for violation of Sec. 12.136, in other words for not keeping a proper log in accordance with the requirements of that section. There were suspensions for "wilful interference with certain other radio communications while operating" and for transmission of "obscene, indecent or profane language."

The greatest safeguard to amateur radio privileges is the vast, alert, responsible body of radio amateurs that truly accepts its responsibilities and opportunities in these times. Personal responsibility in keeping a proper log of every transmission, cooperation with the ARRL and the FCC in quickly reporting every violation of regulations in detail, and care to observe at all times every regulation and operating precaution will be necessary to see us through. It should not be necessary for the FCC to make continued suspensions for Order No. 72 violations. However, some of those eleven newly suspended for this can tell you that the FCC monitors have ways of checking completely through all subterfuges, so it definitely doesn't pay to pretend work with non-existent W's or to sign any false calls, as such

just invites additional penalties! *All amateurs can help most by continuing helpful advices to ARRL and FCC reporting as fully as possible on any and all infractions of Order 72 or other regulations so that irresponsibility cannot pay and so anybody unlicensed posing in our bands may be properly checked on.* There has been ample warning in bulletins and *QST*. All we can suggest is that all amateurs make it a point to help keep amateur radio safe!

UHF or LF? Either way, get your Battery-Powered Set in the Test, October 18th-19th. Mark the calendar now. Put the finishing touches on a new little rig (with handles) if you haven't already got that kind of amateur radio in your shack. Individual-class, lighter weight apparatus will give surprising performance at reasonable cost. Don't let October go by without getting into this fascinating field of amateur work! See full details of scoring for the Battery-Powered ARRL Equipment Test elsewhere in this issue.

The 12th ARRL Sweepstakes . . . November 8th-9th, 15th-16th. Here's an old friend in the contest operating field coming up on the calendar again. It is not only the best chance of the year to "WAS" but the "SS" means operating fun and results for everybody who tries his station in the activity. The "S" dates are tentatively set for the above week ends. Look for full details along the usual lines in November *QST*.

WIAW Official-Information Schedule Changed. You will find elsewhere in these columns a complete listing of the times when WIAW works on certain amateur frequency bands for general contact with the operators on those bands. The times of official broadcast transmissions with frequencies and word speeds are also given. The c.w. telegraph transmission of information to all radio amateurs remains, as usual, a simultaneous transmission on all frequency bands, by tape, starting at 8:30 P.M. and midnight EST. Instead of following this information by voice transmissions in turn on different 'phone bands, the radiotelephone information will now be given at the specified time of opening the period of operation for general work in each telephone sub band, and at one other time daily, as shown by the schedule. We hope all amateurs like the change in policy. It will overcome our former inability to fix the *exact* time for voice-OBS transmissions due to the varying length of the c.w. messages. Also we hope to step up our batting average of stations worked after the OBS transmission. There always have been *some* that

did not understand that "QSW . . ." meant that then and there we had to go to another frequency to live up to our published operating schedule . . . so they called in vain.

Netters . . . Are You Set for 1750-1900-ke. Work? The first list of new registrations in this frequency territory that FCC is clearing (of A-3) for state and section network operations as of December 20th appears in this issue. A lot of additions to our card file are expected to come to light just after the forms for this *QST* are closed. Even though some of the long hop ARRL Trunk Lines are coordinating their operations¹ to share time, the natural increase in use of 3500-3650 kc. by some networks and some ragchewers is going to make a 1.8-Mc. band frequency a "must" by the time the contemplated loan of 300 kc. of "80" is complete. So we urge that all ARRL Section netters (especially NCS) note the policies for Network Frequency Changing, set forth on page 62 of September *QST*, and take steps to get a 1.8-Mc. frequency registered on and ready for use by December 20th or as soon as the frequency sector is clear of A-3. Don't wait until every other Section has registered on the preferred spots of "160." The highest efficiency clear-channel Section nets are likely to be those out of the increasingly QRM-filled "80" regions. SCMs appointing some 160-RMs will start new networks of interested traffic pushers up there this coming winter, and we are anxious to hear from all groups that want to move in from higher frequencies *before* these get going. If we haven't got a letter about your plans can we hear from you to-day, please.

— F. E. H.

¹ Careful planning of joint use of TL "J" frequency for most efficient and continuous use has been completed by RM W6LLW, EC W6RBQ (SF), SCM W6MQM (LA), and with the members of TEs L and F a network consolidation is already fully decided upon and in use. Here's how they are using 3615 kc.: TL L 5:30-6:30 p.m. PST; TL F 6:30-7:00 p.m. PST; CCN 7:00-7:30 p.m. PST; SFN 7:30-10:00 p.m. PST; CCN after-10! If you have a state 750 miles long then time-sharing with a TL is not a bad idea, but otherwise "160" will give better performance . . . and better insurance of freedom from interference.

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Briefs

New Members — O.M.R.C.

The Old Man Radio Club is composed of radio amateurs who are fifty years of age or older. See March, 1941 *QST* (page 61) for references to complete membership list. W1JIS sends us a list of new members, with ages indicated: W7CDS 64; W8VQX 59; W6PNM 58; W5WX 56; W8VAV 53; W1LTT 52; W9OQV 51; W3FM, W9FEW 50. The roster now includes 192 members. Any amateur who is fifty years or older is eligible for membership in the O.M.R.C. Send your date of birth to W1JIS, 46 Beals Court, Rockland, Mass.

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Any amateurs who have extra earphones and would be willing to lend them to crippled persons in the United States are kindly requested to send a card or radiogram to Joseph Cabral, Jr., W1MQT, 147 James St., New Bedford, Mass., advising of their desire to make such a loan.

ARTICLE CONTEST

The article by Mr. J. C. Nelson, W8FU, wins the CD article contest prize this month. We invite entries for this monthly contest. Regarding subject matter, we suggest, that you tell about what activity you find most interesting in amateur radio. Here you will find an almost limitless variety of subjects. Perhaps you would like to write on working for code proficiency, Emergency Corps planning, traffic work, working in Section Nets, Phone and Telegraph operating procedures, holding a League appointment, working on radio club committees, organizing or running a radio club, the most interesting band or type of ham activity, or some other subject near to your heart.

Each month we will print the most interesting and valuable article received. Please mark your contribution "for the CD contest." Prize winners may select a bound *Handbook*, *QST* Binder and League Emblem, six logs, eight pads radiogram blanks, DX Map and three pads, or any other combination of ARRL supplies of equivalent value. Try your luck!

"Some Do's and Don'ts for 'Phone Hams"

BY J. C. NELSON, W8FU*

1. *DO* keep talking. Pauses may mean losing a QSO. Listening stations may tune over you during a pause in your transmission. Think of the power you waste and the extra QRM you cause!

2. *DO* use push-to-talk. Long transmissions take too much time when in a roundtable (some five-station tables take an hour to go around once). By the time all the stations have made long transmissions everybody is either about to fall off into slumber, or they have forgotten the things talked about. Also remember that in the midst of one of your long windbag sessions your contact may be called to dinner or somewhere else. He won't be able to tell you, so he must either wait for you to quit the chewing and possibly make his folks at home sore, or leave without explaining and make you sore.

3. *DO* announce your call when testing. Of course, testing with your regular antenna for any length of time over a few seconds is lousy enough. But to keep whistling and mumbling "1-2-3-4, hello test" for hours without identifying yourself is awful! The receiving ham can't tell who you are and doesn't know whether to take a chance on waiting until you finish so he can call or to look for another station. If he knew who you were, he could make up his mind immediately.

4. *DO* use a dummy antenna for testing. Rig up a double-pole, double-throw switch to change over if you are too lazy to bother any other way. You wouldn't drive your car around the block for an hour or two at a time just to test it. The cop would arrest you for disorderly conduct. So don't put your rig on the ham bands for hours with your antenna on. It interferes with ham operation and is unnecessary. A suitable dummy will load that rig just as well.

5. *DON'T* say "WE," "OURS," and "US" in your transmissions when the rules of grammar specify the use of "I," "MINE," and "ME." The first person singular pronoun sounds better and doesn't grate on your listener's ears.

6. *DO* be careful not to repeat certain words over and over in your conversation. I hear some hams who work to death the words *QUITE*, *THERE* and others. After you use a certain word just so many times it gets very monotonous to your listeners.

7. *DON'T* repeat sentences. If your signal is in the clear and you are being received with satisfactory strength it is totally unnecessary to repeat anything. Here is a sample of a repeater, "I'm using 100 watts here. I'm using 100 watts here." Now can you figure out any valid reason for this dope

*75 Minaville St., Amsterdam, N. Y.

to repeat that? He wastes 50% of available time and power for nothing and gets his listener impatient.

8. *DO* use the ARRL word list for identification. Standardize this to make identification easy for all hams.

9. *DO* make an effort to obey that regulation about use of minimum power input for a given distance. When working Joe in the next block run your 300 watts down to 30 or so, or detune your antenna, or stick a dummy antenna on. Joe doesn't need your 300 watts over there.

Trainee Traffic Stations

TABULATED below is a list of all the amateur stations we know to be currently active at training schools camps, cantonments, etc. We can add to this list and keep it up to date only if amateurs in the services keep us posted on their activities. Drop a line or send a radiogram to the Communications Dept. giving your call, address, frequency and operator names. Please be sure to advise of any changes in location so that our information may be as accurate as possible.

W1LOZ/4 (14,350 kcs.) — Camp Blanding, Fla.

W1UE — Ensign E. L. Battery, U. S. Naval Reserve Radio School, Noroton Heights, Conn., operates on 3525, 3640 kc. and various ARRL trunk line frequencies evenings.

W2BBK — Capt. J. L. Evans, M. C. Station Hospital, Ft. Tilden, N. Y., operates 3510 kc. nightly from 6:30 to 7:00 P.M. EDST, 3535 kc. from 12:30 to 1 P.M., 7100 kc. evenings, schedules W2SC nightly and will take schedules for all posts in N. Y. and N. J.

W2LWB/4 — John A. Chinchio, Co. C, 68th A. R., Fort Benning, Ga., has free message center facilities.

W2MAP/3 — Richard J. Meyer, 51st Signal Bn., Fort Dix, N. J.

W2MYY/3 — Thomas R. Donovan, Reg. Hq., 113th Inf., Fort Dix, N. J.

W3HZK/4 (7214 kc.) — Pvt. L. R. Hampton, Hq. Co., 67th A. R., Ft. Benning, Ga., wants W1 and W3 skeds. He already works W2ANW, W2LSD, W2LZR, W8RKR and W9BRD. He can QsP camps in Florida, Alabama, Georgia, North and South Carolina, Texas, Mississippi and Tennessee.

W3JCY/K4 (7250 kc.) — This station is at Ponce Air Base, 22nd Pursuit Squadron, Ponce, P. R.

W3JQG — Hq. Bty, 1st Bn., 165th F. A., 44th Div., Fort Dix, N. J., operates weekdays, Sat. and Sun. afternoon and evening.

W4FCW — Capt. Chas. E. McArthur, M. C. 121st Inf., Ft. Jackson, S. C., schedules W4EMT at Camp Croft, ties in with the S. C. Net each Sunday and reports lots of traffic.

W4HSI — Pvt. R. C. Scoville, Hq. Co., 28th Inf., Fort Jackson, S. C.

W4HVH — Geo. C. Wetmore, 2d Bn. Hq., 192d F. A., 43rd Div., Camp Blanding, Fla.

W4HEV — Sgt. Martin Hunsucker, Fort Jackson, S. C., has a fine traffic set-up and a 300-watt station.

W5JWK — Lt.-Col. Robert C. Bohannon, Div. Signal Officer, 37th Div., Camp Shelby, Miss.

W7HTB — T. J. Staley, Hq. Bty, 1st Bn. 218th F. A., Fort Lewis, Wash., operates nightly except Sun. on high end of 14 Mc., low end of 7-Mc. and 1.75-Mc. 'phone. W7HTB is assisted in operating by W7HPB and would like schedules with hams in other Army camps to handle traffic.

W7IOQ — L. W. Loken, Everett, Washington, is originating a fine bunch from Paine Field. All are distributed through the Washington Emergency Defense Net on 1.8 Mc. through which incoming traffic for personnel at Paine Field may be routed.

W8QQK/9 — William G. Bruening, Fort Leonard Wood, Mo. Station, is operated by W8QQK, W8IXJ and W8UUO, and is looking for traffic.

W8UIH — Pvt. Stanley Goodbread, 1206th Service Unit, Fort Niagara, N. Y., operates 'phone and c.w. on all bands

Amateur Radio Provides Communications for Poughkeepsie Regatta

COMPLETE radio coverage was provided to facilitate conducting the annual Intercollegiate Crew Regatta on the Hudson River at Poughkeepsie, N. Y., on June 25th, by members of the Mid-Hudson Amateur Radio Club of Poughkeepsie.

The radio network included portable transmitting and receiving stations on the referee's yacht which followed the crews down the race course, the judges' boat anchored at the finish line, the observation train which paralleled the crews on the West Shore Railroad along the river bank, at one of the crew boathouses on the east shore of the river and at the Poughkeepsie Yacht Club on the east shore of the river. In addition to these complete stations, receiving equipment was also operated at the Columbia Boathouse and the Highland Railroad Station, both on the west shore of the river, and at the Vassar Hospital grounds in Poughkeepsie, which overlook the race course. Public address systems were in use at the latter two points to keep the public informed on developments in the races.

The Regatta, which is the big national event in eight-oared shell racing, includes three races; the Freshman race over a two-mile course, the Junior Varsity event over a three-mile course and the big Varsity race over a four-mile course.

In order to be able to use 1.75- and 28-Mc. portable equipment for this coverage, the Mid-Hudson amateurs asked for special permission from the FCC. The Commission very graciously granted this permission through their Special Order 73-G, dated June 11, 1941. It was necessary to use 1.75- and 28-Mc. equipment because preliminary tests with 112-Mc. gear indicated that this band could not be depended on for reliable communication, probably largely because a steel railroad bridge and a steel vehicle bridge span the river in the middle of the race course and seemed to soak up most of the 112-Mc. energy. The 56-Mc. band might possibly have been usable, but nobody had equipment to try it out with.

On the referee's yacht (a Coast Guard cutter) the operators were W2CGT, president of the Mid-Hudson Amateur Radio Club, and W2AGZ. The call used was W2CGT, transmitting on 28-Mc. 'phone and receiving on 1.75-Mc. 'phone.

Donald P. Love, secretary of the Mid-Hudson Club, was stationed on the judges' boat, transmitting on 112 Mc. and receiving on both 112 and 1.75-Mc. under his own call, W2BJX.

On the observation train the operator was W2IYH, who transmitted and received on 1.75-Mc. 'phone.

At the Wisconsin boathouse, W2KGU was the operator, assisted by Edward Pritchard and using call W2AGZ. Transmission was on 1.75-Mc. 'phone and reception on both 1.75 and 28 Mc.

W2DOS and W2CVT operated at the Poughkeepsie Yacht Club using W2DOS on 1.75-Mc. 'phone and W2CVT on 112-Mc. 'phone.

At the Columbia boathouse, Fred Wohlfahrt operated the receiver. At the Highland railroad station a young man named Potocko had charge of the receiver, and at the Vassar Hospital grounds Edward V. Hedinger twirled the dials. Also, Gurdon R. Abell, Jr., was stationed on the west shore of the river at the finish line, with a receiver.

Signals on 28 Mc. originating from the referee's yacht were picked up at the Wisconsin boathouse and the information put out on 1.75 Mc. for all the other points in the network. Signals originating from the judges' boat were picked up on 112 Mc. at the Poughkeepsie Yacht Club (only 1/2 mile away, so results were good), and this information likewise was put out on 1.75 Mc. for other points in the net. All work from the observation train was on 1.75 Mc.

Through the use of this very comprehensive layout, it was possible for the Regatta officials, the crew coaches and others at the various boathouses, and the general public within earshot of the public address systems, to be kept in touch with the progress of the races and the official results and finish times of each crew in each race. Because of the extent

of the coverage attempted, it took a little while for all hands to get clicking efficiently, and consequently the results were not quite 100% effective until the second race.

The handling of this project was a very interesting and educational experience to the local hams, as it was something quite different from anything they had attempted before. Having analyzed the methods and results of this experiment, the gang already are eagerly looking forward to turning in a perfect performance when the next Regatta is held in June, 1942.

— Donald P. Love, W2BJX
Secretary, Mid-Hudson Amateur Radio Club

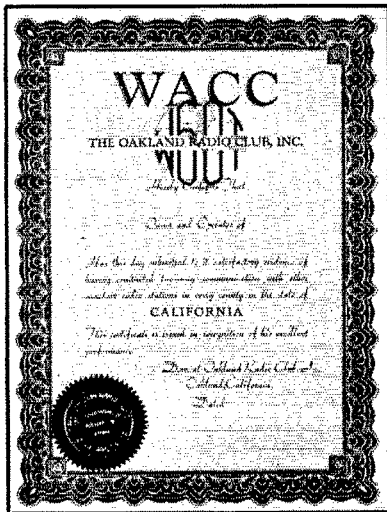
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BRIEFS

Amateur Exonerated of Violation Charges — Rightful Violator Penalized

The Federal Communications Commission recently revoked its order of February 25, 1941, in suspending, for the remainder of the license term, the amateur radio operator and amateur station license of Robert B. Caris, W2HXL. The action was based on subsequent written admission by another amateur, George W. Wright, W2HZY, of Bloomfield, N. J., that the latter had transmitted language in violation of Section 326 of the Communications Act, the offense originally charged against Caris. The Commission further adopted orders revoking Wright's amateur radio station license, and suspending his amateur radio operator license with Class A privileges for the remainder of the license term.

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The Oakland Radio Club offers this attractive certificate to any operator who is successful in making two-way contact by amateur radio with every county in the state of California. There are fifty-eight counties in all! Rules: Work all fifty-eight counties. Stations worked do not have to be permanent, but can be mobile units. Mobile stations are ineligible for the award. Applicants for the certificate must be present at a regular meeting of the Oakland Radio Club for the presentation, if they are within reasonable distance of Oakland. Membership in the club is not a requirement. QSL cards confirming all contacts must be presented. Any further information desired may be obtained from Arthur A. Sinclair, W6FKQ, Secretary, Oakland Radio Club, East 15th St. and Miller Ave., Oakland, Calif.

Brass Pounders' League

Call	Orig.	Del.	Rel.	Extra Del. Credit	Total
W6ROZ	220	156	1826	145	2347
W7EBQ	243	344	1298	290	2175
W5OW	131	136	1360	96	1723
W2SC	78	227	1143	141	1589
W6PGB	255	300	476	290	1321
W6FWJ*	327	38	838	38	1241
W5FDR	97	289	472	275	1133
W3BWT	49	65	931	58	1103
W9JMG	37	65	879	3	984
W6LUJ	233	354	7	352	946
W4DWB	22	52	818	40	932
W9ILH	4	76	818	11	909
W6FWJ	210	240	138	240	828
W3FJU	20	31	750	13	814
W3AOC	57	74	600	50	781
W9DIR	25	70	582	61	738
W6RBQ	42	149	341	149	681
W8SJF	9	19	610	11	649
W9OZN	7	2	602	0	611
W6NRP	37	145	198	131	511

MORE-THAN-ONE-OPERATOR STATIONS

Call	Orig.	Del.	Rel.	Extra Del. Credit	Total
KAIHR	1320	1295	4	1002	3621
W3USA	148	69	1564	69	1850

These stations "make" the B.P.L. with total of 500 or over. One hundred deliveries + Ex. Del. Credits also rate B.P.L. standing. The following one-operator stations make the B.P.L. on deliveries. Deliveries count.

W8DAO, 423	W2CGG, 156	W2BGV, 113
W2MLW, 274	W6KOL, 152	W2JQI, 111
W5MN, 214	W8PLA, 151	W3CIZ, 104
W5BB, 190	W9VEE, 135	W4HHG, 102
W9YOS, 189	W8UFH, 131	W3FGJ, 101
W6RGQ, 174	W9ZQP, 122	

A.A.R.S.

Call	Orig.	Del.	Rel.	Extra Del. Credit	Total
WLMH (W6CDA)	14	23	823	17	877
WLN (W2SC)	59	118	557	67	801

MORE-THAN-ONE-OPERATOR

WLM (W3USA)	297	155	2477	155	3084
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A total of 500 or more or 100 deliveries + Ex. D. Cr. will put you in line for a place in the B.P.L.

* June-July.

1750-1900-KC. NETWORK REGISTRATION HONOR ROLL

The following ARRL Nets are the first to register their intention to work in the frequency territory 1750-1900 kc. in accordance with policies outlined by the Communications Manager in his Operating News lead last month:

- 1776 kc. — Kentucky Section Net
- 1778.5 kc. — Michigan QMN Net
- 1780 kc. — Western New York ORS Net
- 1804 kc. — Mission Trail Net (Calif.)
- 1850 kc. — Southern New Jersey ORS Net
- 1865 kc. — Ohio Regulars Net
- 1882.5 kc. — Illinois Section Net

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Hamfest Schedule

October 11th, at Schenectady, N. Y.: The Schenectady Amateur Radio Association's Annual Hamfest will be held Saturday, October 11th. Everybody welcome. Plan now to be on hand. There will be the usual fine program of speakers, demonstrations etc. Further details may be obtained from Ward Alexander, W2NHY, Secretary, 945 Maple Ave., Schenectady, N. Y.

Code Practice

THE amateur stations listed below conduct automatically-sent code practice transmissions for the benefit of those who are trying to improve their code copying ability. There follows the schedules of several commercial stations whose press and weather transmissions make excellent code practice material. It should be noted well that press and other data specifically addressed *may not be divulged* except to the addressee. Amateurs are cautioned against using such material except for practice.

Amateur-Band Code Practice

W1AW — 10:15 P.M. EST, except Fri. (15-35 wpm); 1761-3575-7150—14254-28510 kcs.

W6AM* — 5:45-6:10 P.M. PST, Mondays (15-35 wpm); 14306 kcs.

W9HCC — 8:30-9:30 P.M. CST, Tues., Thurs. and Fri. (20, 25 and 30 wpm); simultaneously on 3532-7058-14312 kcs.

* Subject to cancellation on occasional dates when opr. is away.

Press and Weather Transmissions

(All Times Given are E.S.T.)

22 W.P.M.	1:50 P.M.	Mon. thru Sat.	WBE/WCB
	6:30 P.M.	Mon. thru Sat.	WBE/WJP
	9:00 P.M.	Sun. thru Fri.	WCB/WBG2
25 W.P.M.	Midnight	Mon. thru Fri.	WJP/WBG2
	11:00 A.M.	Daily	WDL
30 W.P.M.	5:00 A.M.	Mon. thru Sat.	WDE/WHL
	8:00 A.M.	Sun. only	WDH/WRK
	9:00 A.M.	Mon. thru Sat.	WDH/WRK
	2:00 P.M.	Daily	WDH/WRK
	6:15 P.M.	Daily	WRK
	7:00 P.M.	Daily	WRK/WHL
	37 W.P.M.	7:00 A.M.	Mon. thru Sat.
8:00 A.M.		Mon. thru Sat.	WCX/WJS
10:00 A.M.		Sun. only	WJS
11:00 A.M.		Mon. thru Sat.	WCX/WJS
Noon		Mon. thru Sat.	WCX/WJS
Noon		Sun. only	WCX/WJS
1:15 P.M.		Mon. thru Sat.	WJS
2:15 P.M.		Mon. thru Sat.	WJS
4:30 P.M.		Daily	WCX/WJS
5:15 P.M.		Daily	WCX/WJS
6:00 P.M.		Mon. thru Sat.	WCX/WJS
50 W.P.M.	8:05 P.M.	Daily	WCX/WJS
	8:50 P.M.	Daily	WCX/WJS
	10:05 P.M.	Daily	WCX
	6:00 A.M.	Mon. thru Sat.	WPU
	6:30 A.M.	Mon. thru Sat.	WRM
	8:00 A.M.	Mon. thru Sat.	WRM
	10:00 A.M.	Mon. thru Sat.	WRM
	Noon	Mon. thru Sat.	WRM
	1:50 P.M.	Mon. thru Sat.	WRM
	2:50 P.M.	Mon. thru Sat.	WRM
6:30 P.M.	Mon. thru Sat.	WPU	
8:40 P.M.	Mon. thru Sat.	WPI	
9:15 P.M.	Mon. thru Sat.	WPK2	

Frequencies: WBE 19850; WBG2 7615; WCB 15580; WCX 7850; WDH 19470; WHL 10750; WJP 8810; WJS 15700; WPJ 11640; WPK2 13185; WPU 14635; WRK 15910; WRM 18560; WSL 109, 5555, 11115.

Miscellaneous:

3:30-4:30 P.M. IAC 12865 (Appx. 40 W.P.M.)
 5:00-8:00 P.M. GIC 8640; GID 13555; GIH 10650 (20 W.P.M.)
 6:00-8:00 P.M. DLE 10130 (Appx. 20 W.P.M.)
 6:30-8:00 P.M. DON 10128 (Appx. 35 W.P.M.)
 7:00 P.M. LOL 8690; PPR 8310; WFC 6785
 8:00 P.M. WAC 10470; WFD 4985
 8:30 P.M. WPN 6410
 9:00 P.M. NSS 5965 (50 W.P.M.)
 10:00 P.M. KUP 6440; NAA 9250; NPG 12885; NSS 4525; XDF 4800; XDD 13043

11:15 P.M. WSC 8430; WSL 5555
 Midnight KPH 8440, 12735; KTK 6400, 8680; NSS 4525
 (All Times P.S.T.)

7:00 A.M. NPG	9090 kc.
8:30 A.M. JUP	13060 kc.
2:30 P.M. KTK	16740 and 12495 kcs.
4:00 P.M. NAA/NSS	9250 kc.
5:15 P.M. WPN	11295 kc.
7:00 P.M. NPG	9090 kc.
8:00 P.M. KJH	7815 kc.
8:20 P.M. WGG/WSC	6340 kc.
9:00 P.M. KTK	8680 and 12495 kcs.
10:00 P.M. KFS	8380, 12550 and 97.5 kcs.
10:00 P.M. KWJ	15000 kc.
12:10 A.M. KPH	8440 and 12380 kcs

BRIEFS

An emergency fire alarm network to cooperate with the Boston Fire Dept. is being organized by WIHNV, who asks that interested amateurs, particularly those operating on 56 Mc., get in touch with him.

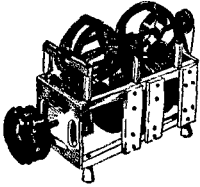
Amateur Network Performs Noteworthy Service

Amateur radio continues to add to its list of good deeds! The Arizona ARRL State Emergency 160-Meter Phone Net had its first "emergency" workout on June 30th. After roll call at 7 P.M., W6TVU was assigned to handle messages from W6QCX at Boy Scout Camp Geronimo. During the course of their traffic work the camp operator broke in with an urgent message telling of an accident in which a boy was injured while rolling an oil barrel, and requesting an ambulance to bring the lad to a Phoenix hospital. W6TVU had difficulty in copying W6QCX due to QRM from a coast station, and was assisted in getting the text of the message by W6RLC, W6SNI and W6RQX. An answer was despatched, the ambulance sent and the boy taken to the hospital where, fortunately, his injuries were found not to be serious. Other amateurs who assisted in handling the emergency messages were W6NRI and W6MOY.

For the benefit of beginning amateurs, the following amateurs have volunteered code practice schedules in the 1750-ke. band: WIMXT, Maine, 1950 kc., Tues., Thurs. and Sat., 6:30-7:00 P.M. EST; W7IFK, Washington, 1940 kc., Tues. and Fri., 7:30-9:00 P.M. PST; W7IGZ, Washington, 1977.5 kc., Tues. and Thurs., 2:00-4:00 P.M. PST.

The excellent work done by W9BSP in conducting code practice transmissions on 160 meters merited him the Paley Award for 1940 (see page 26, July, 1941 QST). Here's further proof of the effectiveness of ARRL 1.75-Mc. code practice stations: W7IGZ recently completed a year and three months of continuous code instruction, having scheduled 195 lessons during that period. As a result of his work, thirty-two amateurs have received licenses, seven of whom are now in government positions! In keeping with the Defense need for trained radio operators which prevails in our country these days, ARRL invites operators who work in the 160-meter band to participate in this season's code practice program. Drop us a line for information on how to go about putting code instruction on the air.

U. S. Coast and Geodetic Survey vessel "Explorer" is engaged in a charting expedition in the Pacific. The station aboard is licensed under the call WTED and the following amateur stations have been granted special permission by the FCC to communicate with the "Explorer" and KYD, an associated shore station, in accordance with Section 12.101 of the Commission's Rules and Regulations: W7GNE, W7GVH, W7HSC and W7CRJ. These amateurs have also been authorized to communicate with station WTEB on board the "Discoverer."



A NEW National Catalogue for 1942 is just coming off the press, and as usual, a copy is yours for the asking.

Among the new products, the most interesting perhaps is the 5-B-100 Tank Circuit which tunes through five amateur bands without plug-in coils. This was described in experimental form in *QST* for November and December 1939. The 5-B-100 is similar in principle to the early version, but is vastly improved in details of construction.

You may recall from the *QST* description that the basic unit of the 5-B-100 consists of a variable condenser ganged to a variable inductance, the latter being somewhat similar to the variometers used in the pioneer days of radio. This combination covers a tuning range of four to one with nearly constant L/C ratio. Furthermore, a link output coil will provide nearly constant loading at all frequencies.

To extend the range of the unit to cover five amateur bands (which requires a 16 to 1 range), a second tuned circuit is added. This is similar to the one described above, the principal difference being that it is designed for higher frequencies. Both tanks remain in circuit at all times, so that for any given setting of the dial, the 5-B-100 can resonate at either of two widely separated frequencies. Harmonic relationship between these two frequencies is absent in all amateur bands, and the mutual inductance of the coils is very low, so that in practice the 5-B-100 behaves very much like a single tuned circuit. In one respect it is much better than the conventional tuned circuit. Harmonics from the low frequency bands are suppressed without sacrifice of efficiency on the high frequency bands, because of the excellent L/C ratio at all frequencies.

The convenience of the 5-B-100 is very marked. To operate at any desired frequency, it is merely necessary to supply excitation of that frequency and to turn the dial of the 5-B-100 until resonance is obtained. RENEUTRALIZATION is not required and frequency changes can be made in a matter of seconds.

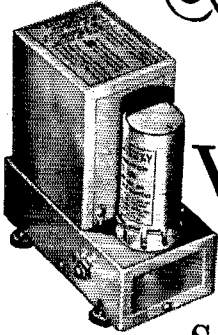
The 5-B-100 is a complete tank circuit in itself, and includes the RF Choke as well as the tuned circuits. Although only 4" x 6" x 8", it is rated up to 150 watts input as a plate tank for RF Amplifiers. It is an ideal plate tank for such tubes as the 35T, 809, 811, 812, RK-11, RK-12, HK-24, etc.

You will find the 5-B-100 described in the new National Catalogue, along with such other newcomers as the AO and AL Dials, and the new MS Condenser. Better get a copy at your dealer's.

EUGENE SIMMS



BELIEVE ME.. THE
VIBRAPACK GOES IN FIRST
EVERY TIME!



Vibrapak
(TRADE MARK REG. U. S. PAT. OFFICE)

**The Perfect
Portable Power**

**Supply Wherever
Plate Voltage is needed**

Might as well forget to go as forget to take along your Vibrapack. It's tops for portable transmitters, receivers and P. A. Systems. No other power supply offers such a host of desirable features.

- 1. Dependability**—Proved by thousands of police radio installations where Vibrapacks operate on a 24-hour-a-day schedule to give unflinching service.
- 2. Efficiency**—Which means noticeably less current drain from the storage battery.
- 3. Compact**—light in weight—Important where space is limited, or where weight is important as in airplane installations.
- 4. Low first cost**—A big investment is unnecessary—you will save by using a genuine Mallory Vibrapack.
- 5. Low maintenance cost**—less time required for servicing—The only part of a Vibrapack which normally ever wears and requires replacement is the long-life vibrator. It requires but an instant to install a new vibrator—compare this with the elaborate overhaul required by other forms of power conversion equipment.

Ask your distributor for technical data on Vibrapacks, or write for Form E-555C.

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MALLORY
APPROVED
PRECISION PRODUCTS

W1AW Operating Schedule

Effective September 25th

OPERATING-VISITING HOURS:

2:00 P.M.—2:00 A.M. EST daily, except Saturday—Sunday
Saturday and Sunday—7:00 P.M.—1:00 A.M. EST.

Frequencies and Times

OFFICIAL BROADCAST SCHEDULE, sending addressed information to all radio amateurs.

C.W.: 1761-3575-7150-14,254-28,510-58,968 kc. (simultaneously).

Starting Times (P.M.)				Speeds (W.P.M.)						
EST	CST	MST	PST	M	T	W	Th	F	Sat	Sun
8:30	7:30	6:30	5:30	20	15	25	15	20	—	20
Midnight	11:00	10:00	9:00	15	25	15	20	15	15	—

*Phone: 1905, 3952.0, 14,237, 28,510, 58,968

All voice transmission marked * under "general operation" starts off a period of general ham contact on the given frequency. The operator, when sending OBC on more than one band, listens for replies on the frequency indicated after transmissions at the times marked *.

*PHONE:

Frequency	Time EST
1906 kc.	*6:30 P.M., 12:45 A.M.
3952 kc.	*9:15 P.M., 12:30 A.M.
14,237 kc.	2:30 P.M., *4:30 P.M.
28,510 kc.	*2:00 P.M., 6:00 P.M.
58,968 kc.	2:00 P.M., *6:00 P.M., 9:15 P.M., 12:30 A.M.

CODE PRACTICE: Besides the OBS times and word-speeds given above, W1AW will adhere to a schedule for sending code practice transmissions at progressively increasing speeds (15 to 35 w.p.m. in 5 w.p.m. steps) daily except Friday, starting at 9:45 P.M. EST. The Proficiency Certificate Award qualifying runs, after a 15-minute advance notice at 9:45 P.M. EST, start at 10:00 P.M. EST, September 20th and October 19th. Daytime runs for qualification, after preliminary call at 1:30 P.M. EST, start at 1:45 P.M. EST on September 7th and October 5th.

GENERAL OPERATION: Besides specific schedules in different bands, W1AW devotes the following periods, except Saturdays and Sundays, to GENERAL work in the following bands:

Time EST	Frequency
*2:00 P.M.—2:30 P.M.	28,510-kc. 'phone
3:30 P.M.—4:00 P.M.	7150-kc. c.w.
*4:30 P.M.—5:00 P.M.	14,237-kc. 'phone
*6:00 P.M.—6:30 P.M.	58,968-kc. 'phone
*6:30 P.M.—7:00 P.M.	1906-kc. 'phone
7:30 P.M.—8:00 P.M.	14,254-kc. c.w.
*9:15 P.M.—9:45 P.M.	3952-kc. 'phone
12:45 A.M.—1:15 A.M.	1906/1760-kc. 'phone/c.w.
1:15 A.M.—2:00 A.M.	3575-kc. c.w.

6:45 P.M.—7:30 P.M.: Schedules on 3500-kc. band.
9:45 P.M.—11:00 P.M.: Code Practice, all c.w. freqs.
11:00 P.M.—Midnight: National Trunk Line Net, NCS.

At other times, and on Saturdays and Sundays, operation is devoted to the most profitable use of bands for general contacts and to participation in special week-end operating activities. The station is not operated on legal national holidays.

ELECTION NOTICES

To all A.R.R.L. Members residing in the Sections listed below:

(The list gives the Sections, closing date for receipt of nominating petitions for Section Manager, the name of the present incumbent and the date of expiration of his term of office.) This notice supersedes previous notices.

In cases where no valid nominating petitions have been received from A.R.R.L. members residing in the different Sections in response to our previous notices, the closing dates for receipt of nominating petitions are set ahead of the dates given herewith. In the absence of nominating petitions from Members of a Section, the incumbent continues to hold his official position and

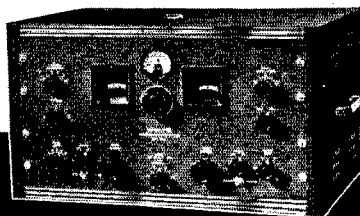


"SUPER PRO" receivers occupy important positions in our national defense program. Engineers in both military and naval services have found that the "Super Pro" is able to do the most difficult jobs. That's because the "Super Pro" is not an experiment. It has been tried, proved and improved over a number of years, making it outstanding in every detail.

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424-438 West 33rd St., New York

Complete technical information on the "Super Pro" is available for the asking. Write Dept. Q-10 for 16 page booklet containing diagrams, curves and other interesting technical information.

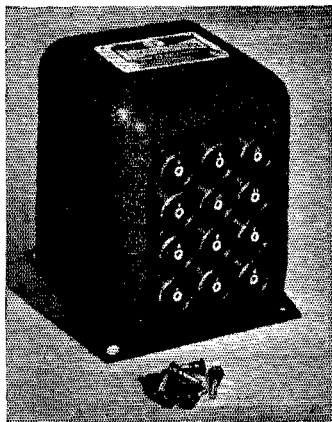
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WISE OPERATORS USE THORDARSON!

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ELEC. MFG. CO.

500 W. Huron St., Chicago, Ill.
TRANSFORMER SPECIALISTS SINCE 1898

carry on the work of the Section subject, of course, to the filing of proper nominating petitions and the holding of an election by ballot or as may be necessary. Petitions must be in West Hartford on or before noon of the dates specified.

Due to resignation in the San Joaquin Valley Section, nominating petitions are hereby solicited for the office of Section Communications Manager in this Section, and the closing date for receipt of nominations at A.R.R.L. Headquarters is herewith specified as noon, Wednesday, October 1, 1941.

Section	Closing Date	Present SCM	Present Term Of Office Ends
San Joaquin Valley	Oct. 1, 1941	Edwin A. Andrews (resigned)
Philippines	Oct. 1, 1941	George L. Rickard	Oct. 15, 1938
Kentucky	Oct. 1, 1941	Darrell A. Downard	April 15, 1940
Western Florida	Oct. 1, 1941	Oscar Cederstrom	April 15, 1941
New Mexico	Oct. 1, 1941	Dr. Hilton W. Gillett	April 15, 1941
So. Texas	Oct. 1, 1941	Lee Hughes	June 15, 1941
Sacramento Valley	Oct. 1, 1941	Vincent N. Feldhausen	June 15, 1941
Hawaii	Oct. 1, 1941	Francis T. Blatt	Feb. 28, 1941
Md.-Del.-D.C.	Oct. 1, 1941	Hermann E. Hobbs	Sept. 17, 1941
Eastern Florida	Oct. 1, 1941	Carl G. Schaal	Oct. 15, 1941
Missouri	Oct. 1, 1941	Letha Allendorf	Oct. 19, 1941
Nevada	Oct. 15, 1941	Edward W. Heim	Nov. 1, 1941
Oklahoma	Oct. 15, 1941	R. W. Battern	Nov. 1, 1941
Eastern New York	Oct. 15, 1941	Robert E. Haight	Nov. 1, 1941
West Virginia	Nov. 3, 1941	W. D. Tabler	Nov. 21, 1941
Western New York	Nov. 17, 1941	Fred Chichester	Dec. 6, 1941
Connecticut	Dec. 1, 1941	Frederick Ellis, Jr.	Dec. 13, 1941
Wisconsin	Dec. 1, 1941	Aldrich C. Kronas	Dec. 18, 1941
Southern Texas	Dec. 15, 1941	Horace E. Biddy	Dec. 23, 1941
Louisiana	Dec. 15, 1941	W. J. Wilkinson, Jr.	Jan. 2, 1942

1. You are hereby notified that an election for an A.R.R.L. Section Communications Manager for the next two-year term of office is about to be held in each of these Sections in accordance with the provisions of the By-Laws.

2. The elections will take place in the different Sections immediately after the closing date for receipt of nominating petitions as given opposite the different Sections. The Ballots mailed from Headquarters will list in alphabetical sequence the names of all eligible candidates nominated for the position by A.R.R.L. members residing in the Sections concerned. Ballots will be mailed to members as of the closing dates specified above, for receipt of nominating petitions.

3. Nominating petitions from the Sections named are hereby solicited. Five or more A.R.R.L. members residing in any Section have the privilege of nominating any member of the League as candidate for Section Manager. The following form for nomination is suggested:

(Place and date)

Communications Manager, A.R.R.L.
38 La Salle Road, West Hartford, Conn.

We, the undersigned members of the A.R.R.L. residing in the Section of the Division hereby nominate as candidate for Section Communications Manager for this Section for the next two-year term of office.

(Five or more signatures of A.R.R.L. members are required.) The candidates and five or more signers must be League members in good standing or the petition will be thrown out as invalid. Each candidate must have been a licensed amateur operator for at least two years and similarly, a member of the League for at least one continuous year, immediately prior to his nomination or the petition will likewise be invalidated. The complete name, address, and station call of the candidate should be included. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon of the closing date given for receipt of nominating petitions. There is no limit to the number of petitions that may be filed, but no member shall sign more than one.

4. Members are urged to take initiative immediately, filing petitions for the officials of each Section listed above. This is your opportunity to put the man of your choice in office to carry on the work of the organization in your Section.

— F. E. Handy, Communications Manager

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed in a number of Sections, as provided in our Constitution and By-Laws, electing the following officials, the term of office starting on the date given.

So. Carolina	Ted Ferguson	Aug. 25, 1941
Eastern Penna.	Jerry Mathis	Aug. 28, 1941



W5JVR suggests it's good practice copying through QRM to stand on a busy street corner and see what you can make out of the combinations inadvertently blown on passing automobile horns!

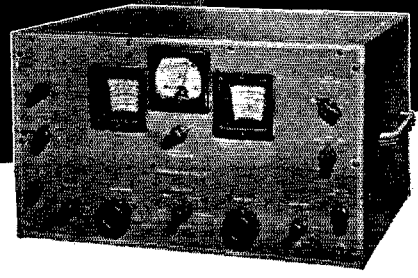


**W. A. S.
ON
160
METERS
IN
20
HOURS**



**SETS A
RECORD...**

with his **HQ-120-X**



BILL GUIMONT was the outstanding operator in the recent 160 meter W.A.S. party. The new record he established is just another example of the real value of amateur radio. Bill was operating just for fun but it shows what can be expected of an efficient ham station during an emergency. Bill, W9JID, reports his HQ-120-X contributed in no small way to his setting a new record. Its ease of operation made the long hours at the controls

much less tiresome and gave him an opportunity to demonstrate the skill with which amateurs operate their stations. Congratulations Bill, you did a fine job.

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Next Year... WHAT?



SOMETIMES we find it difficult warding off a tendency to accept an "ostrich logic" . . . to bury our head in the sand . . . to close our eyes to realities. But questions persist in our minds, even as they must in yours.

- Will the emergency have passed?
- Will raw materials be more plentiful?
- Will productive capacity be ample to fill commercial requirements?
- Will radio amateurs be operating under "normal" conditions?

These questions we cannot answer with any optimistic assurances.

Today, in spite of the intense pressure of defense requirements which must receive precedence, we are making every effort to maintain our line of CARDWELL CONDENSERS for amateur and commercial applications.

Whether it be tomorrow, next year or in the more distant future . . . better-than-ever CARDWELLS will be available to you.

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MANUFACTURING CORPORATION**
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WIAW SENDING-PRACTICE SUBJECTS AND QUALIFYING RUNS

Daily-except-Friday WIAW Code Practice Starts at 9:45 P.M. E.S.T.

The subjects given below will be followed each Sunday, Tuesday, and Thursday, September 21st to November 1st, and the text is identified to make sending practice available. To get sending help hook up your own key and buzzer or audio oscillator, turn to the QST material, tune in WIAW, and attempt to send right in step with the tape signals. Adjust your spacing in the manner the received signal indicates necessary for improvement.

Date Subject of Practice Text from September QST

- *Sept. 21. U. S. A. Calling, Navy Commissions for Electronics Specialists, p. 36.
- *Sept. 23. A Simple Filter for Elimination of B.C.I., p. 47.
- *Sept. 25. Signal Corps Radio School, p. 9.
- *Sept. 8. Here and There, p. 43.
- *Sept. 30. The Radiolocator, p. 7.
- Oct. 2. Our Contribution to National Defense, p. 7.
- Oct. 5. 1:30 P.M. E.S.T. WIAW daylight-qualifying run. Unannounced Copy.
- Oct. 7. Election Notice, on Renewing Licenses, pp. 30-31. Adapting the 6L6, etc., p. 58.
- Oct. 9. Radio at the Moel Airplane Meet, p. 15.
- Oct. 12. Miniature Tubes in a UHF Converter, p. 18.
- Oct. 14. Five Meter Wave Paths, p. 23.
- Oct. 16. Ham Haven, p. 28. The C.S.O. Says . . . p. 29.
- Oct. 19. Evening Qualifying Run, 9:45 P.M. E.S.T. Unannounced Copy.
- Oct. 21. Handle Your Traffic on 160, p. 11.
- Oct. 23. A Band-Edge Spotting Oscillator, p. 32.
- Oct. 26. The Secrets of Good Sending, p. 35.
- Oct. 28. Antennas for Domestic Work, p. 38.
- Oct. 30. In the Services, pp. 44-45.

* August 1941 QST.

O.R.S./O.P.S. Activities

If you have a good 'phone, why not drop a line to your SCM (address in each QST) for application blanks for OPS appointment? ARRL Headquarters will also be glad to send information regarding OPS work to any amateur who inquires, including sample copies of bulletin material as long as extra copies last. Every high quality 'phone station which is operated in line with correct practices should be included in the Official 'Phone Station roster.

The Official Relay Station appointment is primarily a traffic appointment, for amateurs interested in regular traffic work, schedules, etc. Opportunity is given all ORS appointees to test station performance during quarterly QSO parties. The pleasure derived from these get-togethers can be fully appreciated only by participation. If sincerely interested in traffic handling, take steps now to obtain ORS appointment! Drop a line to ARRL Headquarters or direct to your SCM for complete details on how to become ORS. Act now and get ready for the big fall/winter season.

Apparently the winning score of WITS in the previous party was too much for the E. Pa. lads. They came back in the July Party with a vengeance this time, W3DGM taking top position and W3BES sliding into second place. WITS placed third after running a close race with Jerry. The fourth total over ten million was made by W3SN, a new call in the "high ten" who appears intent on pushing right up into the honor positions.



“No it ain’t a rainmaker—Hank has to watercool his antenna since he put in his new GL-810’s”

HANK’S OM merely means that with GL-810’s you put plenty of soup in your antenna. The skywire will fairly sing with your signal.

GL-810’s are used as the final amplifiers in the G-E 250-watt frequency-modulation broadcast transmitter because of their low cost, and high efficiency and stability at high frequencies.

GL-810’s are easy to drive, easy to neutralize, excellent for a-f or r-f service.

Look ’em over at your dealer’s or write for complete dope (just ask for Bulletin GET-755A).

GL-810 TRANSMITTING TRIODE . . . Net \$13.50

Class B Audio—2 tubes

Ample output to plate-modulate a 1-kw rig; driving power, 13 watts.

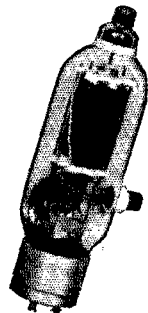
Class C 'Phone—Plate Modulated*

Input, per pair 900 watts
 Driving power, per pair 34 watts

Class C Telegraph*

Input, per pair—1000 watts, *conservatively* operated; driving power, 24 watts.

*Intermittent Commercial and Amateur Service



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DATA BOOK ON RECEIVING TUBES

It’s different: 24 pgs., 8½ x 11. Includes tube dimensions, base connection diagrams, and interchangeability chart. It lies flat; the type is easy to read; technical information is in easy-to-get tabular form.

Also

- GEA-3315B on G-E Transmitting Tubes
- GEA-2021B on G-E Pyranol Capacitors

General Electric, Section 161-27,
 Schenectady, N. Y. Please send me free the items checked.

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**BLILEY
Type B 5**
40 meters
\$4.80



**BLILEY
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Type BC 3**
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**BLILEY
Type HF 2**
20 meters
\$5.75



**BLILEY
Type LD 2**
80-160
meters
\$4.80



In the OPS shindig W4DCQ led for the 5th consecutive time! Second honors go to W9BOF, who followed not too far behind DCQ, and W1EAO stepped into third place. Nice going, OM's.

The next ORS/OPS Parties will be held October 25th-26th. It promises to be a busy week-end, judging by the amount of activity already evident this season. See you there!

Official Relay Station Scores (July)

Station	Score	Df. Sns.	Df. Sects.	Hears	Power (Watts Input)	Operating Time
W3DGM	12,850,180	215	43	—	200	17 h.
W3BES	11,855,139	203	46	6	300	18 h. 47 m.
W1TS	11,782,130	196	45	—	400	14 h. 5 m.
W3SN	10,973,595	155	46	10	250	19 h.
W4DWB	8,681,040	170	46	10	180	15 h. 50 m.
W8BRD	8,643,456	171	45	16	70	17 h. 35 m.
W9DIR	8,418,480	168	42	18	—	15 h. 27 m.
W2LZR	7,517,580	169	41	8	—	16 h. 20 m.
W9MUX	6,363,588	152	42	7	100	19 h.
W6RUE	5,739,033	108	41	8	225	19 h. 37 m.

Station	Score	Df. Sns.	Df. Sects.	Station	Score	Df. Sns.	Df. Sects.
W8ROX	5,148,294	148	38	W3DRD	2,065,610	99	35
W8SFV	4,676,400	141	39	W1BHH	2,064,816	110	34
W3JBC	4,502,105	137	35	W8OKC	2,060,920	105	29
W3HXA	4,116,535	134	39	W8MLM	2,028,250	103	30
W1TD	4,107,600	129	39	W5DBR	1,815,970	89	33
W1KQY	4,049,925	124	41	W7HTH	1,652,614	63	31
W9NQD	3,979,205	118	43	W6BAM	1,412,472	64	28
W6BHV	3,408,330	88	35	W8KXP	1,318,866	37	27
W9RQM	3,388,245	122	39	W1NDB	1,279,375	84	31
W2JUJ	3,366,730	122	36	W2KYV	1,163,280	80	31
W9INU	3,327,695	122	33	W2LPJ	1,144,151	84	23
W5IKD	3,054,480	101	42	W5IVG	1,109,600	75	34
W3EML	2,950,605	121	32	W6RFP	1,091,367	57	26
W9GHD	2,811,163	105	39	W8RYP	1,088,870	84	26
W9GBJ	2,637,318	100	33	W8UFH	1,032,600	71	29
W8RKM	2,081,480	104	32				

Official 'Phone Station Scores (July)

Station	Score	QSO's	Sects.	Hears	Power (Watts Input)	Operating Time
W4DCQ	6,384	48	24	13	900	5 p. 17 m.
W9BOF	5,700	37	20	—	500	4 p. 23 m.
W1EAO	4,471	31	17	8	250	5 p. 7 m.
W1GKJ	4,214	25	14	13	115	5 h.
W8QFN	4,095	31	15	9	300	7 h. 41 m.

Station	Score	QSO's	Sects.	Station	Score	QSO's	Sects.
W1FBJ	4,004	25	13	W1KTE	2,040	18	10
W1LBB	3,950	23	14	W3AJJ	2,040	22	12
W1LNI	3,575	23	13	W2MIG	2,000	16	10
W1DWP	3,393	21	13	W2JZX	1,892	14	11
W2IYX	2,754	28	17	W2DOQ	1,647	15	9
W3GWQ	2,585	15	11	W8EQN	1,530	20	13
W6CHV	2,348	11	9	W8SPY	1,376	10	8
W8KBJ	2,060	28	14	W8KNF	1,050	17	10

In the Services

(Continued from page 60)

Becker, 9EJY; Kupria, 9IKH, and Heib, 9RRR. National Guardsmen also enrolled in the course were Tech. Sgts. Vietsch, 11EB; Kum, 3HRZ; Staff Sgt. Ehr, 7HOQ; Sgts. Sweeny, 9CZB; Blessin, 9TCF; Uthus, 9IXC; Pfts. Abbott, 1KCO; Scruton, 1LPA; Schenck, 7GDS, and Brooks, 8TSN.

Hams of the Merrimack Valley Amateur Radio Association of Concord, N. H., are well represented in the services to-day. Lt. Smith, 1LBD, and Lt. (jg) Evans, 1BFT, are at Navy headquarters in Boston, RM2C Norris, 1LIN, and RMIC Chandler, 1AWU, are at the d/f station in Winter Harbor, Maine. RMIC May, 1JCA, and RM2C Corson, 1MZV, are with the Atlantic fleet, while Ensign Robinson, 1JBA, and RM3C Noyes, 1MIP, are in the Pacific. Pvts. Wood, 1LVG, and Mills, 1KMC, according to 1BFT did not run true to form, as they enlisted in the Army; both are in the Signal Corps.

Ask your distributor for Circular A-8
BLILEY ELECTRIC CO., ERIE, PA.

THERE ARE MANY REASONS
for preferring

ALSiMAG **INSULATION**

YOU GAIN in many ways when you specify ALSiMAG insulation. In the first place, by using ALSiMAG the manufacturer has the choice of many steatite ceramic compositions, each having definitely determined physical characteristics. Thus ALSiMAG is "right" for the application.

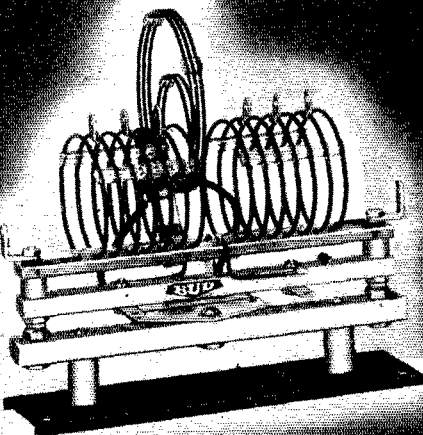
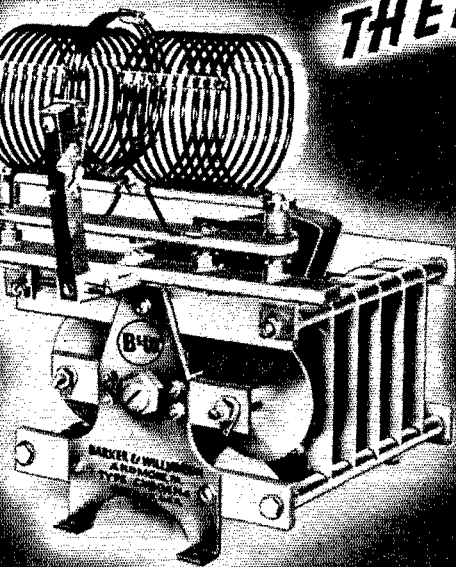
Next, ALSiMAG insulation is almost always custom-made in the size, shape and form required for the application. A perfectly adapted custom-made insulation requires the least possible amount of space, lowers the cost of assembly and frequently eliminates much extra material that would be required to mount and house a larger than necessary insulator.

Thus the demand for higher efficiency with compactness is ably met by ALSiMAG.

A new Property Chart giving the exact physical characteristics of the more frequently used ALSiMAG compositions will be sent you on request.

This advertisement is one of a series designed to give you a better understanding of the advantages of ALSiMag insulation. It is not a solicitation of business. Custom made ALSiMag is sold direct to the manufacturers.

In these applications of ALSiMag 196 the most important physical characteristics are absolute and permanent rigidity, exceptionally high dielectric and mechanical strength and unusually low dielectric loss under all working conditions.



ALSiMAG

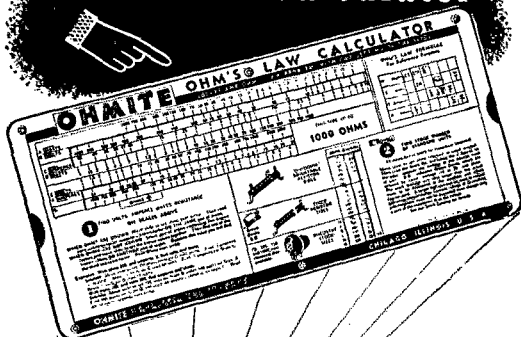
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solves any Ohm's law problem
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Scales on 2 sides cover the range of currents, resistances, wattages and voltages commonly used in radio and commercial work. A setting of the slide also tells the stock number of the resistor or rheostat you may need. Size only $4\frac{1}{8}'' \times 9''$.

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QST—Oct. '41

For highest efficiency, use OHMITE Resistance Units in your rig.

Be Right with **OHMITE**
RHEOSTATS • RESISTORS • TAP SWITCHES

Correspondence

(Continued from page 61)

will enable you to decide whether the League is worth your solid support. If you do, you should soon join the ranks of thousands who say: "The League? It's a good thing we have it. It isn't perfect; nothing is. But it's the only representative organization we have in a world filled with unions and societies. Let's stick together — especially now!"

— William A. Beatty, W1NFN

Headquarters Battery, 2nd Bn., 208th C.A. (AA),
Camp Edwards, Falmouth, Mass.

Editor, QST:

The Correspondence section of your July issue carried some letters concerning radio operators in the army being made to bugle and other non-radio details. The Editor's Note stated that it was practically an impossibility for men to obtain transfers due to expense and the difficult processes involved. I disagree with this entirely. Several of our men have obtained transfers to other branches. The work involved is but a small amount of paper work and the permission of the battery commander which is easily obtained if he is sure the man is bettering himself. It seems too bad to discourage soldiers the way this Editor's Note probably has. If you are really working for the amateur's interest in regard to their work in the army, I would really look into this matter further. — Staff Sgt. Joseph B. Doolittle, W1CTC

EDITOR'S NOTE. — We are glad to know that it is possible for enlisted men in the Coast Artillery easily to obtain transfers to other branches. For those not so fortunate, if any licensed amateur in the service has duties which do not pertain to radio, and desires radio work, he can write the Editor, stating his full name, home address, rank, serial number, outfit, location, present duties and a brief outline of his training and experience. We may be able to help.

CODE PROFICIENCY

1246 Piedmont Ave., N. E., Atlanta, Ga.

Editor, QST:

Thanks to ARRL for the ticket I just received, because without the W1AW nightly code practice I would have been at a total loss.

Permit me to express my sincere appreciation for the help you have given me and that which you are giving prospective hams. — Bessie "Jerrie" Cunningham, W4HWS

36 Waldemar Ave., Winthrop, Mass.

Editor, QST:

. . . Let me add my compliments to the League for this fine activity. I believe it has and will do a great deal to increase the efficiency and value of the average ham in case his services should be needed to help defend our country.

— Linwood M. Pattee, W1LMO

315 West Third St., Junction City, Kans.

Editor, QST:

About a year ago when I first read the details concerning your daily code practice transmissions, I decided to copy them every night as I could see that they were very valuable. It was only reasonable that anything so valuable could not be passed out free of charge for very long, and it was my opinion that they were only to be sent for about a month. As a direct result of improving my speed I was able to get a much better job than I had, and later as my code speed increased further I was enabled to get a raise in pay. . . .

— Herbert L. Holmes

Strays

Friday, the 13th of June was my lucky day. I was presented with a junior op and received my 35-w.p.m. endorsement in the mail! — W9IBU.

Sweepstakes Winners

WHO USED THE

Meissner

SIGNAL SHIFTER

TO PILE UP

Outstanding Scores

IN THE
ARRL

Eleventh
Sweepstakes
Contest

Why Not

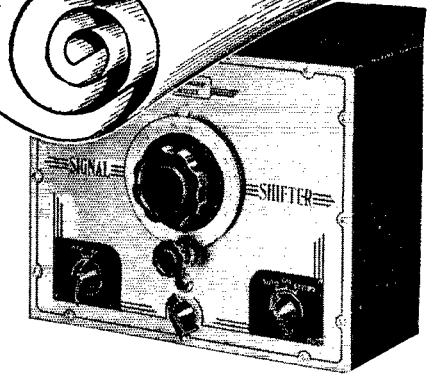
- Avoid QRM?
- Be sure YOUR QSO's are 100%?
- Spot YOUR signal where it will count?
- Make sure that YOU are always out in front?
- Enjoy VFO advantages with a pure T9X note?
- Help relieve congested bands?
- Place YOUR call on the Honor Roll?
- ★ —Get YOUR Signal Shifter NOW?

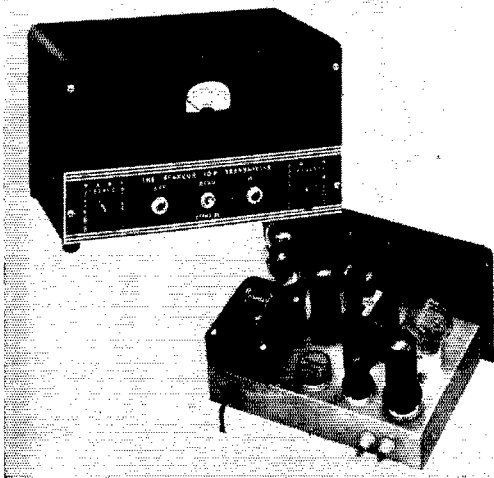
Well over half of the sectional winners in the Eleventh ARRL Sweepstakes Contest employed variable frequency operation—and nearly a third of these have been verified as Meissner Signal Shifters! We can't help but take a certain measure of pride in this achievement—to have such an appreciable percentage of those who came out on top crediting the performance of this instrument with at least a portion of their success! Now is the time to get YOUR Signal Shifter and start training for one of those top scores. See your Jobber AT ONCE!

Write for Free Catalog Today!

Address Dept. Q-10

Meissner MT. CARMEL ILLINOIS
"PRECISION-BUILT PRODUCTS"





THE AMATEUR'S CHOICE
IN THE LOW POWER FIELD

STANCOR'S 10P TRANSMITTER

There are many reasons why amateurs everywhere are choosing 10P transmitters.

OPERATING ECONOMY. The 10P operates on any standard 105-125 volt 60 cycle line and consumes but 75 watts of current. Standard plug-in coils are used to minimize cost of placing transmitter on different bands. Low tube replacement cost is obtained because inexpensive receiving type tubes are used throughout.

OUTSTANDING PERFORMANCE. Many letters received at the factory testify to many transmissions far beyond the customer's expectations.

VERSATILITY. Operates on 10-160 meter bands. Delivers 12 watts phone—20 watts CW, input to final. No complicated tuning procedure is necessary and a minimum number of controls are used.

COMPACTNESS. The unit is entirely self-contained — power supply and all — in a cabinet measuring 10 3/4" x 6 1/4" x 6 1/2" — and weighs 14 pounds. Because of the small size and light weight it is excellent for use at the home station or may be easily transported when vacationing, visiting, or for field day activities.

LOW INITIAL COST. The transmitter can be completely equipped with meter, tubes, crystal, microphone, and coils for operation on one band for approximately \$35.00.

AMATEUR'S NET PRICE **\$22.50**
(LESS ACCESSORIES)

Be sure to investigate the advantages of the 10P transmitter. It is outstanding in every way. Ask your tobber about it.



STANCOR STANDARD TRANSFORMER

CORPORATION
1500 NORTH HALSTED STREET . . . CHICAGO

Strays

The Scott Stamp and Coin Co., 1 W. 47th St., New York puts out a small book called, "Scott Gummed Names of Countries." It contains 832 gummed labels, about 2 1/2 by 3/4 inches, each bearing the name of one of every stamp-issuing country in the world. Several duplicates of the more-common countries are included. These books, which cost 50 cents are just the thing for labelling DX-card albums. — W2IOP.

YLRL, QRV!

(Continued from page 37)

AARS and YLRL nets soon increased her operating speed. Then, while visiting in Minot, N. D., she learned that a friend at b.c. station KLPM was leaving for defense work. Would she take his place until they could secure a permanent op? *Would she?* At first she thought she had taken on more than she could handle, but she was determined to succeed. A speed of 37 to 40 w.p.m. for a half hour at a stretch wasn't exactly hamming when one had to be letter-perfect. She learned, too, that the tape punchers didn't repeat even the hardest names, but she stuck with it for three weeks and gained invaluable experience.

Jean Hudson, W3BAK, a favorite Candler pupil and daughter of an ex-SCM, gained international attention at the age of 9 when she won a world's championship copying code at the Chicago World's Fair. She's no slouch now, either, and at the Asheville Code Tournament not long ago she "copped" the Class B championship, making perfect copy on the mill at 52 w.p.m. with apparent ease.

The YL's are particularly proud of Dorothy Willett, W8UDA. The remarkable thing about her excellent operating is the fact that she is blind. Those who quaked before the radio examiner might be thankful they didn't have the task which confronted her. She had to explain all the diagrams as she didn't have the opportunity to draw them. By no means a shut-in, Dot is socially active and takes in hamfests frequently.

Other YL's are taking the men on in various operating activities and showing them a thing or two at their own game. Marie Onnigian, W6SPX, went into the annual 1.75-Mc. WAS contest, scored 56,700 points and came out sixth on the list.

History was made by local unit No. 3 of the YLRL on the ARRL Field Day in June, as the first all-YL entry. Under the leadership of Leta Bush, W9DBD, secretary-treasurer of the YLRL and editor of "YL Harmonics," the greater St. Louis YL's piled up around 2000 points. Assembling near Alton, Ill., just across the river from St. Louis, the plucky group remained at their rigs throughout the night. Among the participants were able operator Carrie Jones, W9ILH, the Illinois SCM and NCS of the 40-meter YLRL net; Louise Baker, W9JTX; Alice-May Stewart, W9GOJ, and Helen Pallme, W9WVX.



4 TRIODES IN 1

LOW VOLTAGE TUBE...LOW INTERNAL RESISTANCE
with a 10 to 1 safety factor

More than a year ago, Eimac announced these Multi-Unit tubes to the industry under the statement "A Revolutionary Change in Vacuum Tube Design." They were developed in the Eimac laboratories for the precise purpose of providing a high power, low voltage (1000 to 2500 volts) tube having an extremely low internal resistance which would operate efficiently up to 200 megacycles. In actual operation Eimac 304T tubes are seeing service with as much as 20,000 volts on the plates...10 times the rated voltage. Where else is there a tube offering such a safety factor? It's just typical of Eimac's leadership... another reason why Eimac tubes are to be found in the key sockets of most of the important radio transmitters throughout the world.

FOLLOW THE LEADERS TO *Eimac*
TUBES

Eitel-McCullough, Inc. San Bruno, California

EIMAC REPRESENTATIVES

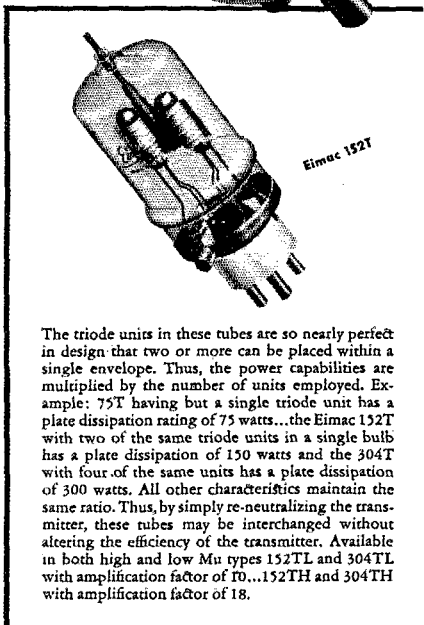
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The triode units in these tubes are so nearly perfect in design that two or more can be placed within a single envelope. Thus, the power capabilities are multiplied by the number of units employed. Example: 75T having but a single triode unit has a plate dissipation rating of 75 watts...the Eimac 152T with two of the same triode units in a single bulb has a plate dissipation of 150 watts and the 304T with four of the same units has a plate dissipation of 300 watts. All other characteristics maintain the same ratio. Thus, by simply re-neutralizing the transmitter, these tubes may be interchanged without altering the efficiency of the transmitter. Available in both high and low Mu types 152TL and 304TL with amplification factor of 10...152TH and 304TH with amplification factor of 18.

RADIO TRAINING



FOUNDED IN 1909

PORT ARTHUR COLLEGE, a non-profit-making educational institution, offers a practical radio operator's course at the lowest tuition price in its history. Each radio graduate receives two months' actual operating experience at the college's commercial broadcasting station KPAC. This station is equipped with the latest type 1000 watt high fidelity RCA transmitter — 1250 kc. — directional antenna system. KPAC operates in new modern studios located on the campus.

The college has never advertised jobs or positions in lieu of education. Today it is well known there is a shortage of radio operators in every branch of radio; particularly flight and ground operators for airlines in America and South America — marine operators for ships traveling coastwise and foreign — geodetic-geographic research — broadcast stations — the Army and Navy — other positions in many departments of the United States Government. Therefore, we believe it is good common sense to mention that Port Arthur College is the sole radio school in America which owns a commercial broadcasting station with commercial advertising representatives in New York, Chicago, San Francisco, and many of America's leading cities, with active membership in the National Association of Broadcasters, and Broadcast Music Incorporated. Through these contacts the college receives from the broadcast industry alone more calls for radio operators than it is possible to supply.

AUTHORIZED TO TEACH RCA TEXTS
If interested, write for Bulletin R

PORT ARTHUR COLLEGE
PORT ARTHUR (World-Known Port)
TEXAS

RADIO OPERATING QUESTIONS^N, ANSWERS

Nilson & Hornung's new edition covers all FCC commercial license exam elements. Standard handbook 20 years. \$2.50, postpaid. Money back if not satisfied and book returned in 10 days. Send check or money order . . . not cash. *Free circular on request.*



NILSON RADIO SCHOOL, 51 East 42nd St., New York

Wanna Swap Crystals?

OKAY. A lot of other hams do, too. The new regs cause a lot of moving around. Here's a cheap way of finding a chap who wants yours and has one you want.

See the paragraph at the end of Hamads. It explains how to do it in a very few words which at 7¢ per word costs very little.

Each band contains its own YLRL net, with net control stations and everything. While nets were successfully operated on all bands, the 10-meter net boasts more members than any other. "California, here we come!" could well have been the signature song of the 10-meter net (if FCC regs permitted music over ham rigs). Under the capable leadership of W6QOJ, nearly 50 YL's checked in at different times. As NCS, Helen marshalled all the formidable number who reported weekly and a few like Eleanor Raffi, W6QXL, and Eunice Loyzin, W1BEQ, who never missed a sked. Particularly due to Helen's efforts, her state now leads in memberships. Ohio follows with New York, Illinois and Missouri next in line.

The YL's take their DX where they find it, just like the OM's. They were particularly vigilant in following the U. S. Antarctic expedition.

As 20-meter NCS, 2nd District chairman Dorothy Hall, W2IXY, successfully arranged a sked with KC4USA for the girls. Then just before pulling up stakes in Palmerland, Antarctica, KC4USB devoted four solid hours to the YLRL and attempted to contact 25 YL stations who had indicated their desire for a QSO. The lucky ones whose signals penetrated that pot-pourri of QRM as everyone and his brother called the East Base were W1FTJ, W3FXZ, W8NAL, W8UDA, W9FRR, W9OWQ, W9NBX and W9ZWL. Ruth Raub, W8ROP, enjoyed 57 QSO's with the expedition and was personally entertained by Dr. Siple, commander of the West Base, when he returned home.

A number of YLRL members live in locations that make them DX to the great body of mainland members. Radio probably means more to them on the whole than it does to those others, for one reason or another.

Take K6TCW (The Cat's Whiskers) for example, who found that radio offered adventure. One day Helen unearthed some "junk" belonging to the OM since his ham days in Toledo, O. Questions followed. His interest was renewed; he again took out a license. She followed suit. They moved to California. One night they talked to a couple from Hilo who had just arrived from San Francisco. Both families expressed a desire to visit Honolulu and jokingly decided to seek each other's company "if and when" they arrived. They packed, went to Hawaii, met their air friends and now play tennis together, again proving the world is a mighty small place via ham radio.

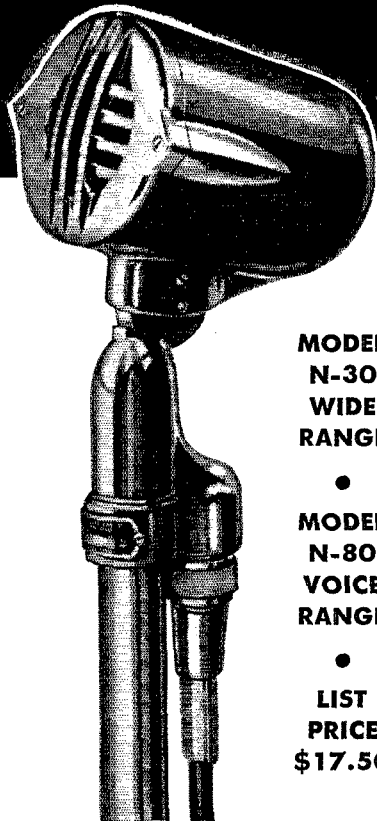
All who vocalize on 10-meter 'phone and have been fortunate enough to contact the two YL members of the Puerto Rico Amateur Radio Club, Jenny Ramirez, K4FOW, and Alice Rodriguez, K4EZR, have experienced the "smile" and warmth of their voices.

Mary Davis, K7ENU, lives 70 miles from the Arctic Circle where the OM is in communications work. She even helps him with the service jobs and also finds time for her hobby of Indian beadloom work. Verna St. Louis, K7HUT, lives in a village on remote Ugashik Lake. A smoking mountain is part of her scenery up there where

SMOOTH FREQUENCY RESPONSE

FOR either amateur or public address requirements, Astatic's new **N-Series Crystal Microphones**, assure exceptionally smooth frequency response and grand all-around performance. These models are made with Astatic's swivel joint, tilting head for adjustment of microphone to semi-directional as well as directional position, adding to its practicability and effective method of acoustic feedback control. Concentric cable connector facilitates quick interchange of cable. **Model N-30** is a hi-fidelity, wide range microphone, 30 to 10,000 cycles, substantially flat and free from peaks. Output level — 52 db below one volt per bar. **Model N-80**, voice range microphone, output level — 49 db below one volt per bar, with rising response to 3,500 cycles, provides efficient speech characteristics to increase intelligibility.

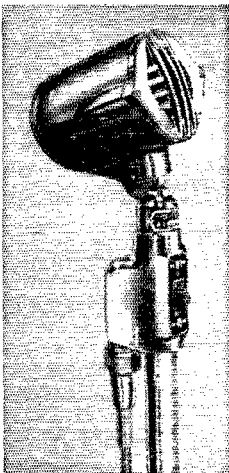
Standard equipment includes 25-ft. low capacity, closely shielded rubber covered cable with spring protector.



**MODEL
N-30
WIDE
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N-80
VOICE
RANGE**

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**LIST
PRICE
\$17.50**



CONVENIENT SWITCH ADAPTOR

When so ordered, at little extra cost, a convenient On-Off Switch, as shown in accompanying illustration, may be had with either model in the N-Series Microphones. This is known as Type "S" Switch Adaptor, the purpose of which is to short the microphone circuit in "off" position.

Model N-30S or N-80S, complete with Type "S" Switch, as illustrated, **List Price \$20.00**

In addition, Astatic Microphones **T-3, WR-20, WR-40, D-104** and **K-2** may be ordered equipped with the Type "S" Switch. This switch is **NOT SOLD SEPARATELY.**

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"All-out" production to meet today's pyramiding orders does not mean that Triplett has lost sight of the broader requirements of tomorrow. Instead, research and engineering programs actually have been "stepped-up" to assure constant improvements in products and processes; in addition to needed developments in new fields.

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Radio Stations, Police
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DEMANDING
Young Men, age 17-20
to avoid draft years

**Train for Radio,
at a Government
Approved School**

A RARE OPPORTUNITY to make good money quickly is now open to the high school graduate. Thousands of radio technicians are needed in defense work as well as in normal business. Men of draft age are being called. And employers are asking for YOUNG men from 17 to 20 years old.

Training for these positions paying up to \$250 a month or more, is rapid and thorough by the Dodge method, so that past interest in radio, although an advantage, is not an essential. You have the free choice today of accepting a low paid job you do not want permanently, or training yourself for a well paid position in an interesting business.

Accept this opportunity now. Prepare for the future in one of the most rapidly progressing industries. Ask any of our graduates about Dodge Institute. The Army has sent many men here for advanced technical training during the past year.

Our next class opens Sept. 29. Act now! Get started on a better future by filling out and mailing coupon for free catalog.

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the winds always blow. You can appreciate what radio means to these girls in Alaska. Mary's mail service is twice a week by plane from Fairbanks and Verna's QTH is 400 miles to the closest 'phone and railroad.

Nell Cory, G2YL is an outstanding radio YL. She has made an intensive study of radio wave propagation and writes on u.h.f. activities for publication. Her lovely garden was transformed into a "sunken garden and ice pond" by unfriendly bombs. Constance Hall, G8LY, is the other English member.

The VE's — so near and yet so far — keep in touch with the W girls by letter writing when not engaged in doing their share in the defense program. Dot, VE4VO, uses her code and first aid knowledge in a Women's Service Corps. While returning on a train from a visit to VE5AEX, her mind on radio, she unconsciously whistled a "CQ". The conductor, passing, introduced himself as VE5MY. The "old" days were recalled in a personal QSO which followed.

Symbols

The YLRL is now much more than a little band of pioneers, but the friendly comradeship that marked its beginnings still characterizes the organization. *Espirit de corps* is high. Contests, parties, conventions, visits to YL's homes — all have lent their bit in cementing friendships and strengthening ties. The girls have their own emblem now, designed by the former president, W7FWB. It bears a scroll and the letters "YLRL" on the familiar diamond-shaped background that has come to symbolize organized amateur radio.

Vice-President Marie Corcoran, W8TPZ, and the OM donated a graceful engraved cup for the annual Anniversary Contest. It was first awarded in 1940 to W1FTJ. A three-time winner can claim permanent possession.

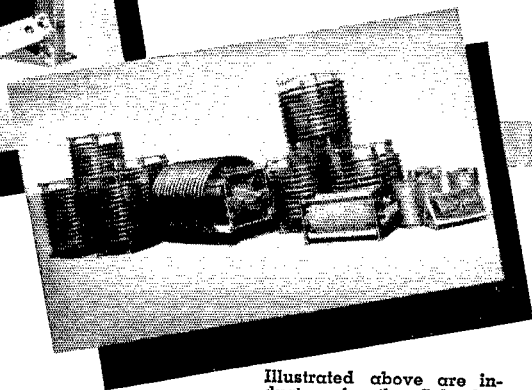
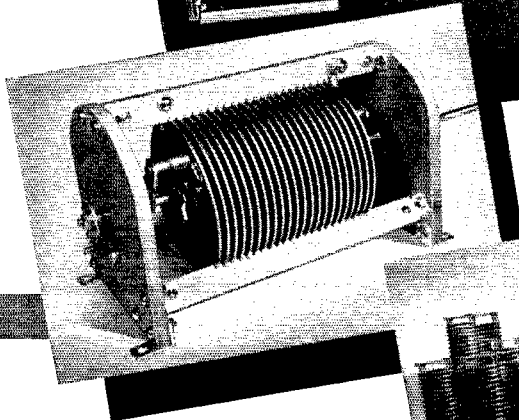
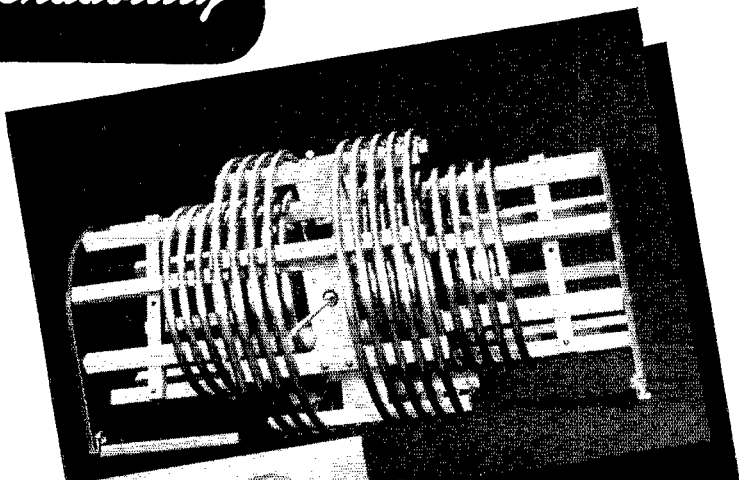
Other YLRL symbols have come into being, too. It was Clara Reger, W8KYR, who originated the YLRL expression "33" — meaning "Love sealed with friendship between one YL and another YL." Jerry Burgett, W9HIG, started the fad of embroidering the girls' call letters and names on blouses and jackets.

The YLRLLeaguers have found a high degree of chivalry and honor accorded them on the ham bands. A book could be written on the courtesies extended them, the donations in stationery, money and membership certificates, the cooperative spirit shown them in sked and contest assistance. The boys even kept the frequencies clear during operation of the YLRL nets. The reverse — sad but true — is likewise experienced, but those cases are in the minority.

The girls ask no special favors but resent any badge of inferiority attached to them as operators. Though emulating masculine supremacy, these women retain their feminine attributes. Their wants are simple and ordinary but their capacity for study and enjoyment is enormous. They have knocked the pins out from under the silly sentiment about a "Woman's sphere," at least in amateur radio work.

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..for Dependability



Not every application demands an inductor rated at 50 KW, but the same Engineering skill and precision workmanship may be found in all Johnson Products. Where dependability is of paramount importance, those who know specify Johnson, whether it is a standard stock part or an especially Engineered and manufactured component. Ask your favorite Jobber about Johnson Quality.

Illustrated above are inductors for the Columbia Broadcasting System and the National Broadcasting Company for 50 KW applications. In the upper photo insulation is Alsimag 196 and in the lower two Mycalex is used.

ASK FOR THE NEW
CATALOG 966J

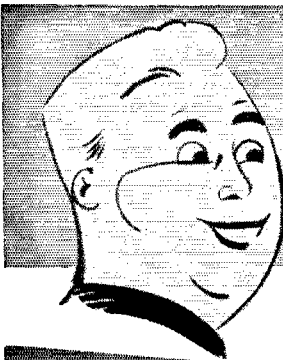


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NOT TOMORROW OR NEXT WEEK
BUT TODAY OUT OF OUR
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EACH AND EVERY SET A REAL VALUE!

ECHOPHONE

EC-1 RECEIVER

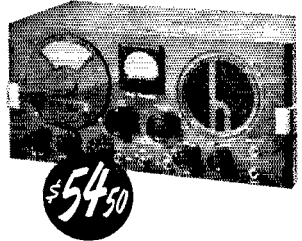
A sure-fire 6-tube communication receiver covering the entire tuning range from 545 KC to 30.5 MC. Bandspread dial, beat frequency oscillator, phone jack. For use on 110 V AC or DC.



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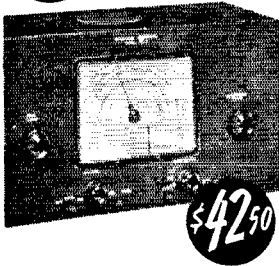
SKY CHAMPION

A real champion in its class, and a genuine favorite with amateur operators. Nine tubes are used to make this receiver perform the way it must to satisfy. **\$13.63** down—**\$7.22** per month for 6 months.



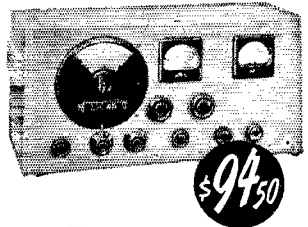
EC-2 RECEIVER

Very satisfactory performance is obtainable with this 8-tube set. Its features include a beat frequency oscillator, noise limiter, and calibrated bandspread dial, external speaker in matching cabinet. For use on 115-125 V AC or DC. **\$10.63** down—**\$8.45** per month for 4 months.



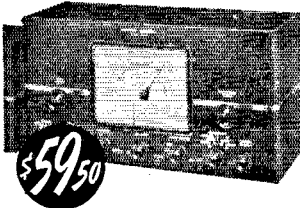
SUPER DEFIANT

The most popular receiver in the entire Hallicrafter line. 12 tubes with coverage from 540 KC to 42 MC. "S" meter, crystal filter, calibrated bandspread for 110 V 60 cycles AC. **\$23.52** down—**\$9.39** per month for 8 months.



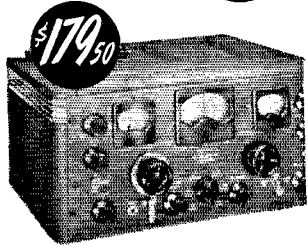
EC-3 RECEIVER

The EC-3 with 9 tubes provides genuine communication set performance. Crystal filter, automatic noise limiter, electrical bandspread, and separate speaker in matching cabinet are just a few of the features. Down payment **\$14.88**—**\$7.89** per month for 6 months.



MODEL SX-28

You can expect top performance from the SX-28. This 15-tube receiver has two stages of RF in addition to a noise limiter, crystal filter, and calibrated bandspread tuning. Designed to rigid specifications. **\$44.87** down, and **\$17.84** per month for 8 months.



Liberal Trade in Allowance!

NO FOOLING—**IMMEDIATE DELIVERY** means exactly what we intend it to mean as this advertisement goes to press. In stock at the present time are nearly 300 new radio receivers. They will not last too long, however, and we would like to make good our promise of delivery to each and every one of our good friends who want a new set. You can do your part by ordering early.

IF YOU HAVE A RECEIVER TO TRADE, LET US QUOTE YOU AN ALLOWANCE ON IT BEFORE YOU DO BUSINESS

BUY ON
EASY TERMS
•
MAIL ORDERS
PROMPTLY FILLED
•
Write for FREE
CATALOG

The RADIO SHACK
167 WASHINGTON ST., BOSTON, MASS., U.S.A.

BUY ON EASY TERMS · MAIL ORDERS PROMPTLY FILLED · WRITE FOR FREE CATALOG

Splendid Receivers

by **NATIONAL** and we can deliver them
out of stock
immediately!

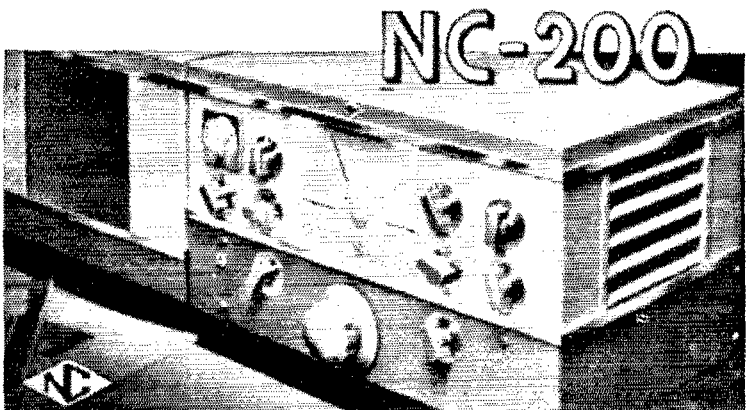


YES, SIR—We know that this improved model NC-45 will provide you with a first class receiver for your amateur station. Complete coverage from 540 KC to 30 MC in 4 bands. It will operate on either AC or DC on boat or on land.

The best in radio engineering has gone into this receiver to make it tops in its class. A noise limiter has been added, and the slide rule type dial with calibrated main tuning and a separate scale for electrical band spread will make the handling of this receiver a genuine pleasure. Gray wrinkle cabinet with speaker in a cabinet to match. **\$14.38** down, and **\$7.62** per month for 6 months.

Only **\$43.63** down, and **\$17.34** per month for 8 months. There is little that we can say to add to the outstanding reputation already created for itself by the performance of the NC-200. For those who are not entirely familiar with this splendid receiver we might say that all of the engineering skill of the National Company for which they are world famous has gone into this receiver. Twelve tubes are used with complete coverage on all of the amateur bands including 10 meters through the broadcast band. Noise limiter, calibrated dial, beat frequency oscillator, are all provided.

The NC-200 is an extremely stable receiver, and one that you will be proud to own.



The RADIO SHACK
167 WASHINGTON ST., BOSTON, MASS., U.S.A.

NEW SHURE "VOICE" UNIDYNE CARDIOID



NOW — the famous Shure Unidyne Microphone in a special series of "voice" models, too! Combines emphasis on "voice" response with all the advantages of the Shure true unidirectional dynamic cardioid. Assures clear speech without interference from background noise or echoes, indoors or outdoors. Cleans up voice transmission — makes break-in 'phone easy. Rugged, shock-proof. Model 55AV — for 35-50 ohm circuits, list price, \$47. Model 55BV — for 200-250 ohm circuits, list price, \$49.50. Model 55CV — high impedance, list price, \$49.50. Patented by Shure Brothers.

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M  **SHURE BROTHERS**
225 W HURON ST. CHICAGO, U.S.A.
CABLE ADDRESS - SHUREMICO
MICROPHONES & ACOUSTIC DEVICES

A.A.R.S. Activities

(Continued from page 53)

WAR-AMATEUR SCHEDULES

THE WAR contacts with amateur stations will continue for the present. A slight change in the schedules has been made to permit contacts with stations in the 1750-2050 kc. band as follows:

EST	WAR Frequency	Amateur Band Worked
9:00-10:00 P.M. — Daily except Sundays	6990 kc.	7000-7300
7:00- 7:45 P.M. — Saturdays only	4020 kc.	3500-3800
7:45- 8:00 P.M. — Saturdays only	4020 kc.	1750-2050

More than 1600 different amateur stations have been worked by WAR since the inauguration of these schedules on December 3, 1940. The distinctive WAR QSL will be sent to all stations worked who have submitted their own cards. A number of amateurs have joined the AARS as a result of their contacts with WAR.

FORM NO. 170 AMATEUR QUESTIONNAIRE

THE coding and tabulation work on the Form 170 questionnaires, received from more than 41,000 amateurs, has been completed in the Office of the Chief Signal Officer. The information has been transferred to individual IBM punch cards.

The following were the various steps involved

(Continued on page 90)

★ OPPORTUNITY UNLIMITED ★

awaits the far-thinking individual who prepares *now* for the increased pay positions in the Army, Navy, or Commercial Communications field. A serious shortage of trained code operators in each of these fields is your guarantee of a promising future — *if you are properly trained.*

BE SMART — start your training NOW *right in your own home.* Learn code the practical way, the easy way — the famous CANDLER way!

THIS COUPON ENTITLES YOU TO YOUR FREE COPY OF THE FASCINATING 52-PAGE BOOK OF FACTS. SEND FOR IT NOW!

CANDLER SYSTEM COMPANY

Dept. Q-10, Box 928, Denver, Colorado

Please rush me my free copy of the 52-page BOOK OF FACTS. I understand I will not be obligated in any way.

Name.....

Street and No.....

City.....State.....

Silent Keys

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

- "Tex" Anding, HI3N, San Pedro, Dominican Republic
- Leroy Clayton Babino, W9TXT, Rhineland, Wis.
- Bennett Emerson, ex-5DU-5ZG, Dallas, Texas
- Lt. Kenneth M. Dwyer, ZS6DB, ex-1AD, Johannesburg, South Africa
- John C. Gill, RM 1 c, U.S.C.G., W60MV, San Bruno, Calif.
- C. H. Hill, ZS4M, Bloemfontein, South Africa
- H. C. McIntosh, VE3ALV, Jackfish, Ontario
- Frederick J. Meschko, W2DDN, Flushing, N. Y.
- James Clayton Randall, W1HPI, WSTMU, Hartford, Conn.
- A/M H. Sperber, ZS1BH, Capetown, South Africa
- George A. Turcott, W8NFG, Watertown, N. Y.
- Charles Raymond Watt, W7BXZ, St. Ignatius, Mont.
- C. Wynne, ZS5CN, Eshowe, Zululand, South Africa

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with
Power!**

LONGER LIFE and GREATER SAFETY

Thousands of satisfied amateur users take great pride in boasting of the ruggedness of TAYLOR TUBES in all classes of service including operation on 112 MC.

Because of the *greater safety factors*, characteristic of all TAYLOR TUBES, longer useful life and better all 'round performance is assured.

You Can't Beat Taylor for Economy & Service

TAYLOR TUBES have built their own record of success under the most adverse conditions of use . . . where tube failures cannot be tolerated. TAYLOR'S basic policy of "MORE WATTS PER DOLLAR" and the famous broad guarantee of satisfactory service protects your investment and provides the utmost in dependable performance, value and economy. More and more amateurs are daily confirming the merits of TAYLOR TUBES. For outstanding performance at the lowest cost always insist on TAYLOR TUBES



ACTUAL
SIZE

PROTECT YOUR RIG!

Ham shacks all over the country are bustling with activity as rigs and associated equipment are being set up for a change in frequencies or just being put in better shape for amateur defense. Knowing hams aren't taking any chances when it comes to tube equipment. Be sure of your tubes . . . protect your rig against unexpected failure . . . retube with TAYLOR TUBES.

**"MORE
WATTS
PER
DOLLAR"**

Taylor HEAVY **CUSTOM BUILT** DUTY **Tubes**

TAYLOR TUBES, INC., 2341 WABANSIA AVE., CHICAGO, ILLINOIS

Station Activities



NEW ENGLAND DIVISION

CONNECTICUT — SCM, Fred Ellis, W1CTI — W1AW will be changing frequency to 3575 kc. from 3825 and 1906 kc. from 1806. TD, KQY, AGT and LTB have been very busy running tests on 112-Mc. emergency equipment for the local Red Cross Chapter. TD acquired an NC101X in preparation for plenty of traffic work this fall and winter. KQY reminds the gang that the Nutmeg Net is under way on 3640 kc. Plans are being made for a get-together of net members early in the fall, probably at WICBA, and it is hoped that former net members now at the Noroton Heights Naval Radio School, will be able to attend. ITI is active on the AARS Net. JJJ is building a 300-watt 'phone to take back to college. LOP is working temporarily at ARRL. Lightning hit his 112-Mc. rig and put it off the air besides doing other damage. We regret to record the passing of BDI's father. The deepest sympathy of all the gang is extended to you, Ed. INF schedules W9QKJ three times a week and also has rig going on 59 Mc. with f.m., but no one to talk with. BIH has a new signal shifter and Class A ticket. DWP enjoyed the ORS Party and is looking forward to full and more activity. HYF had a vacation and visited JXP, IRX, NEQ, MRJ and MYX. NCV will attend North-eastern University in Boston. CTI is spending vacation in Burlington, Vt., where this report was written.

Traffic: W1AW 700 (WLMK 27) W1TD 88 ITI 54 LOP 9 BDI 11 INF 7 DWP 4 BIH 2.

MAINE — SCM, Ames R. Millett, W1BAV — New OPS: EWN, DHD, KNJ — FBJ is EC for the Portland area and in a very short time he has whipped things into great shape in his district. DHH is now located in Everett, Mass., and has a small portable rig on the air; some of the boys have been working him on 3.9-Mc. 'phone this summer. IJW went on a two weeks' canoe trip through Mount Kahtahdin territory, and kept in daily contact with MYM, the home station for Camp Androscooggin at Wayne, through the excellent schedule furnished by CMO. NHT is on 3.5-Mc. c.w. The Northern Maine Net is now well organized and operating nightly, Mondays through Fridays, on 1980 kc. with the following stations reporting in regularly: ANU, HNS, IUM, JAA, KJU, KZK, KNJ, KRZ, LYW, MED, MIL, MYD, MXN, MXT, NBK, NDV and 4FAL '1. LNI spent a couple weeks' vacation at Sebago Lake, with plenty of portable gear, and worked some fb schedules using a swell EO1-fed doublet. 2HCY was around the State on a vacation, and LOA had the pleasure of a visit from Sarge. 2ITD dropped in on GKJ and had a chance to work the rig there! 2KQM has been operating portable on 3.9-Mc. 'phone from Camp Chickawah, at Harrison, this summer. IFZ is making rapid recovery from his operation and is at home from the hospital. IFF is working in the shipyard at Bath as a machinist. IIE is collaborating with Admiral Hooper and Mr. George Clark of RCA in writing a complete history of Navy Radio and the record of Bar Harbor Radio and its able commanding officer, Lieutenant Allesandro Fabbri. History of this work and pictures of the experiments in loop reception by Dr. Pickard will be of great interest to hams. I am sure. DRZ is at Walpole. NDC is operating portable at Bath! MGR plans to give 7-Mc. 'phone a try when the band is opened. GKC is on 7-Mc. c.w. as well as a regular on MNM. MIUY is going to town on 7 Mc. with 809 final double antenna. CBU is knocking off short skip on 28 Mc. for the summer. MDG is putting up a new antenna, and will be on MNM shortly. GQ is working 28 Mc. with a vertical. BX gets on for a little c.w. when time permits. LKP was visited this past month by BAQ, 2AYJ, 2ANM, 2BJO, 1FJP and 1EJO. It looks as though there is going to be plenty of interest in the ultra highs this year. Let's see if we can't get some urban area nets started on these frequencies, gang.

Traffic: W1LNI 11 LOA 30 LKP 41 MXT 33 DHD 14 GKC 16 GKJ 4 KNJ 54 BAV 27 CMO 24 NGV 11 CFO 9 FAP 83 GE 41 GHT 4 GVS 112 IJF 58 IST 27 KOU 116 LML 86.

EASTERN MASS. — SCM, Frank L. Baker, Jr., W1ALP — Don't forget the New England Div. Convention and 8th Annual Boston Hamfest, on October 18th, at the Hotel Bradford, Boston. JOX is in charge of the tickets, so

write him early. See announcement on another page in this issue. Hope to see you all present. New EC's: AXA, Swampscott; GAG, Stoneham; MBQ, Vineyard Haven. NF is now OPS. New OBS: EPE on 3.5-Mc. c.w.; GDY, 14-Mc. 'phone; GOU, 28-Mc. 'phone; KTE, 3.9-Mc. 'phone; MQO, 112- and 28-Mc. 'phone. Listen to these stations for the latest dope and tell them once in awhile that you listen to them they are doing a good service. AAR and KSA put on a demonstration of 112-Mc. mobile rig for the Boston Red Cross. FB, fellows. NAV applied for ORS; he is ex-W8DFW. Welcome, Lou. MJK is still out touring the country. AGX has portable 112-Mc. rig. MQT applied for ORS. JSM/1 has schedule from Maine camp with his dad. GZ, MZE is working on e.c.o. KTE and HNV are working on Boston Fire Alarm Net. Any hams in Boston who are willing to help out, please write them. HOB will be on again soon. Welcome to NPE, a new ham on 28-Mc. 'phone. HX is on at new QTH in Melrose. JLK and AR will be OPS soon. IVS is on 14-Mc. 'phone, and had several visitors from out of state. NF acted as net control for DJ on 56 Mc. while Art was down on Cape Cod. NKW is working on 28-Mc. rig. New officers of the 36-Mc. Minutemen: pres., EHT; vice-pres., EKT; secy., HQ. New officers of Eastern Mass. ARA: pres., EHT; vice-pres., DMS; secy., HQ. EHT has new 200-watt rig on 56 Mc. CIB has new beam on 28 Mc. NPR is the call of the No. Attleboro High School Radio Club. LNN is on 3.9-Mc. 'phone. MMD is aboard USS *McCormick*. MGQ has new junior op. Congrants, OM. NKK is on 112 Mc. NHR has new MRT-3 on 112 Mc. BDM has new 14-18-Mc. beam. LZW joined the Smoke Eaters. KH gets home some week-ends. He has 112-Mc. portable rig in Washington, D. C., and he listens in on all bands. KCT has new 500-watt gas engine-driven a.c. generator. Welcome to new Fall River hams NKQ and NNN. ACT is active on 1.75-Mc. 'phone and wants to contact other club stations on Thursday, from 7 p.m. on 1840 kc. AWZ is building 1.75-Mc. receiver for Boy Scout camp station in Westport. CRN is working transmitter. FZU is going in for recordings of qso's on the air. The Frogs Network very active. 'Fo all EC's: Due to the proposed changes in the 3.5-Mc. band, we had better stand by on the two frequencies mentioned for the EMEN on 3868/3968 kc., but 2020 kc. should be going soon. Let's hear from you about crystals for this. BVR spent a day in Boston making a few flying visits. Our former REC, DTP, is now 4JH. LSW is going to have new radio room. JYC is building 112-Mc. rig. EKT has worked all districts but W7 on 56 Mc., this year. GGY is working portable-mobile on the Cape. DGS is back home again from the South. LRO is building an e.c.o.

Traffic: W1AGX 29 HWE 34 JFN 38 LVZ 66 MQE 6 KB 9 EPE 132 (WLGS 6) FGT 6 MAN 7 TY 61 EYR 116 QD 7 LWI 40 BHL 32 MBS 76 MMY 52 MQH 64 MIG 30 MON 172 FVL 11 IYU 30 MNW 41 MOJ 37 MLZ 5 AAL 8 AHP 11 KYN 5 AR 11 LSA 52 BWJ 33 AKS 235 (WLG0 74) FMG 172 AR 165 BXC 138 KCT 119 LYG/1 109 BDU 109 LWH 107 (WLGX 135) NAV 94 BMO 57 FSL 51 KXU 43 JCK 38 (WLGV 4) MJK 33 MQT 22 MZE 19 JSM 1 16 KKO 14 KTE 13 HX 10 WI 5 MDV 4 GAG-HUV 3 IVS-KZT 2 GDY-MXP 2 NF-NKW-EHT 1 JLK 7 LBH 15. (June-July: W1JSM 1 20 JLK 7.)

WESTERN MASS. — SCM, William J. Barrett, W1JAH — Plenty of traffic scores this month, but doggone little news!! Most of the news boils down to the fact that we are all getting set for our most active season in years. Chair City Radio Assn. named new officers: BIV, pres.; AUN, vice-pres.; KIK, secy.-treas.; DCH, activities mgr. AZW reports Pittsfield Radio Club now holding emergency drills each Sunday morning on 3555 kc. and 112 Mc., under direction of JLT, who is doing a swell job as EC. AZW visited FOI and JEP, and was visited by JAH. NNI is serving with Navy. Lee says his ticket finally caught up with him in Panama!! AJ got into swing of AARS nets in short order. DUZ is getting lined up for real active season. MVF reports that four Pittsberg hams who took in Worcester Radio Assn. Hambore — LXE, MBL, MIM and MVF all came home with prizes, looks like inside job. MVF is Asst. EC now. GZL had meeting of some of West Mass. and Conn. 'phone gang at his summer camp. Among those present were KZU, KER, IEQ, EVZ, GQT, KK and LEP and their XYL's and YL's. FOI is getting West Mass. 1.75-Mc. AARS 'Phone Net off to early start.

Traffic: W1IOR 200 (W1GJ 60) LUA 108 (WLG0 16) FOI 100 MIM 96 BIV 92 (WLG0 28) BVR 90 (WLG0 122) AZW 79 (WLG0 59) MYZ 50 JAH 47 (WLG0 21) MKR 43 MBT-KZS 40 BXF 37 NKN 28 MND 27 JWV-

WLH 22 AJ 21 MJP-BWY 18 FNY 12 MVF-NLL 10 ADF
6 KUW 5 JFA 4.

NEW HAMPSHIRE—SCM, Dorothy W. Evans, W1FTJ — LSN was out with 1U1 in Kingston on UHF get-together. They operated entirely from storage battery with 7 watts input and contacted 14 different stations on 56 Mc. JKH advises that after a set-back from recent operation, he is now on the gain once more. You can't keep a good man down. MMG has now fully recovered from his trip to the hospital, and is working on his e.c.o. MUW went to Trenton (N. J.) Hamfest. NOP is new ham in Manchester. KKQ attended recent Worcester Hamfest. LVK is off the air temporarily, but will soon be on 14 Mc. MLO is going to operate from N. H. University this fall. KIN says he is missing his W1 friends even though he is doing well in his new job down in Florida. The Farmers' Net is moving to 1995 kc. after September 1st. MXO is going to give 1.75-Mc. 'phone a try. NOP can be found on the low end of 3.5 Mc. AGO moved to Manchester. MPY, MKD and MCB are working at Manchester Air Base. LLD is planning to get on 28 Mc. HFO went to New York by air transport, recently, and reports an FB trip. Manchester boasts a new "Mr. & Mrs." combination, with 8CYT and 8QGT having moved there from Syracuse. 8CYT is a Lieutenant stationed at the Manchester Air Base. MOI changed QTH. FTJ has been elected First District Chairman of the YLRL for the ensuing year. IVU is changing QTH again! It's real hard to keep track of that fellow! Nashua Mike and Key Club held their Annual Outing at Silver Lake on August 10th. MRC had an outing at GDE's QTH on September 7th. As plans now stand, there will be no N. H. Hamfest this year.

Traffic: W1JKH 21 MMG 10.

RHODE ISLAND—SCM, Clayton C. Gordon, W1HRC — Since I will be away when what few reports I have been receiving lately arrive, there may be a bit missing in this report that might show up otherwise which I hope you boys will please excuse. From the reports we get verbally, however, I can assure you that the gang is very active. W1HRC has been appointed to Division 5 of the R. I. Defense Council in charge of amateur radio and aviation. From my activities in this capacity is arising considerable action towards making ourselves more valuable in the event we are needed to help. The major move concerns an attempt to standardize our portable emergency equipment for size, weight, power requirements, tube complement, and interchangeability of units. 112-Mc. equipment appears to be best suited to what may be required of us. The dual power unit described on page 276, Chapter 18 of the 1940 *Handbook*, figs. 1804 and 1805, has been generally considered the most useful type of power supply. "A" and "B" battery supply type power is not considered as satisfactory generally, since fresh "B" batteries are not as readily obtainable as storage batteries. The PRA has appointed a committee to prepare tentative standardization plans, and other clubs and groups are being urged to join in arriving at a final plan that will be acceptable to the entire State. The East Providence group has been very active in organizing, cooperating closely with Police Chief Crosby, who has been lending very active and helpful support and encouragement to their work. The Civilian Air Reserve has a very fine nucleus for a Signal Division, headed by ETD and DDY; and JP and LYE are training would-be amateurs for licenses. CPV is making excellent progress in the Pawtucket Section with a Signal Corps for the State Guard. The Westerly gang are very lively. If we can all pull together, we can come somewhere near living up to what the State Government expects of amateur radio. I believe the spirit is there and the rest is a matter of time and energy to accomplish the objective. Jim Connolly is now NPQ. Jim's enthusiasm while learning and his helpful spirit at the various PRA activities, such as Field Day, etc., make all the boys exceptionally happy to hear he got his ticket.

Traffic: W1HRC 2.

VERMONT—SCM, C. G. Parker, W1KJG — ND reports steady progress on the FB electric organ installation at his home. 3JMQ was recent visitor at AVP. Bill contemplates c.w. operation, and reports excellent DX conditions on 14 Mc. AEC registrations were received from IDM and JVS. NLO, GAN and others in Burlington are busy with preparations for the State Hamfest to be held October 4th at Burlington. NLO has submitted a fine tentative program, and everything indicates a good time. SCM bulletin and postals will give complete details later. GAN is rebuilding and incorporating emergency power. KDB is planning to move to Winooski. AEA and XYL announce a new junior

operator — ten pounds and seven — and all doing well. Congratulations from the Section! Charles has been busy correcting keying difficulties in his rig. KTB has been welcomed home from his assignment at Fort Sill, Okla. Merwin is now Supt. of Schools for the Caledonia North District and will retain his old QTH of Lydon Center. GAB is now with U. S. Airways, Box 891, Dillon, Mont. He is likely to be heard on about 7100 kc. GQJ is active on 3.9-Mc. 'phone and has been appointed ORS and OPS. MMU carried on schedules during summer and is building a new final using 204-A. JXS is rebuilding for 'phone and c.w. NLO visited JXS and MMU. JVS received a fine write-up in the *Burlington Free Press* with station photos, etc. CBW is using a small portable at camp for carrying on traffic work. NDB completed WAS and expects certificate shortly. Visitors at KJG during the month were IDM, CBW, KUY, MLJ, ND. With the proposed changes in the 3.5-Mc. band under the new orders, the Vermont ARRL Net frequency, 3860 kc., will become unavailable. Temporarily, the AARS frequency, 3715, may be utilized when necessary if that net has closed before 8 P.M. Your SCM would seriously recommend that the Vermont net frequency be moved to 1.75-Mc. band. AD's operation last year on 160 would seem to confirm that for Vermont coverage it is very satisfactory and it will also avoid cross-band operation to points already using 1.75-Mc. 'phone and c.w. Please consider this and be ready to submit your views at the hamfest.

Traffic: W1AVP 15 MMU 16 NDB 31.

HUDSON DIVISION

EASTERN NEW YORK—SCM, Robert E. Haight, W2LU — W2KVG is doing a swell job handling traffic. JQI reports traffic for AARS; he is State Radio Aide and has special call WLNK. NCG got Class A and 30 wpm endorsement sticker. He is on 3.9- and 14-Mc. 'phone and 3.5-, 7- and 14-Mc. c.w. with 60 watts. BQR, NRD and NHY join with the EC boys. LLU reports activity on 3.5 Mc., and keeps Feura Bush on the map. The Section loses two members. MIY is located at Washington, D. C., and NIY is in the Navy. Our best wishes to both Dot and Andy.

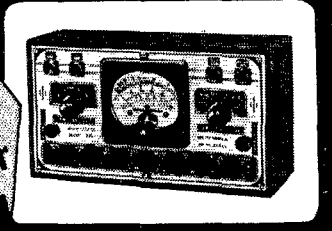
Traffic: W2KVG 77 EQD 312 LU 82 JRG 6 (HTU 9 IIR 20 LRZ 58 KWG 86 JQI 66 8SFD 24 8QMR 129 June-July) KCI 18 JQI 145 LLK 49 IJG-MSW 7 BEW 6 HDV 6 8SFD 22 8QMR 45.

NEW YORK CITY AND LONG ISLAND—SCM, Ed. L. Baunach, W2AZV — MFR applied for ORS and OAF for OPS. AXZ, who is chief op at SC, is now proud father of a baby girl born Aug. 18th. On Aug. 6th OCZ worked his first station with 3 watts input on 7169 kc. NLQ took along DK-3 on his vacation. BO's vacation put a dent in his traffic total. BWC has been appointed State Radio Aide of Southern N.Y.S. AARS Net. HGO has been inactive due to the loss of his father. VG is building an e.c.o. unit and getting his antenna ready for the fall. LXX is now working in N.Y.C. for RCA. NJZ is pre-war 1AQJ and AMT. A bad crystal has kept MIO from sending his regular OBS schedule. JZX is busy with Women's Defense Committee in Nassau County. MWT has rebuilt his rig to run 400 watts input on 1.75 Mc., and can increase it to 700 watts. AV keeps schedules with 4EWY in Savannah, Ga., for Camp Stewart. KYV spent vacation traveling around the eastern part of the country. HC1FG was a recent visitor at NNWA. NAZ is busy teaching code class to the AWVS. NDQ has been working on 112 Mc.; present rig is 6C5, pr. 6V6, RK48 with 30 watts input and a National I-10 receiver. Central Queens Radio Club resumed activities with first meeting, on Sept. 8th, at 96-09 66th Ave., Forest Hills. Anyone interested in joining should write the club secretary at the address given above. AGW, ARW, LZU, QI and MSS held a meeting at BC's QTH, and had the pleasure of having V. Boyde of KC4USA tell of his very many exciting experiences. CN moved to Teaneck, N. J. IOP has been rebuilding his emergency station for operation on the Section Net. EC reports that the AP trunk line opened officially Sept. 15th on 3630 kc., and operates Monday through Friday. LGS is new Secretary of the Q.R.A. in Ridgewood. KI keeps his schedule with 3BWT regularly on 3698 kc. JBL can be heard on 7660 kc. AZV is spending his time building a new shack. BGV and LYC keep their AARS schedules regularly. DBQ is looking for more men to join the AARS Net on 7 Mc. The Navy Dept. keeps LR traveling around L. I. ADW is working exclusively on the ultra highs. IYX has got the North Fork Section of the R.C. going with MBM, ST, MWV, HAA, LWE and FFD as emergency operated stations. Any-

(Continued on page 92)

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AC-DC
Multitester**



Quality in appearance, performance, materials and construction put this RCP general test instrument in a class with testers costing twice as much. Look at the specifications:

- DC Voltmeter 0/5/50/250/500/2500
- DC Milliammeter 0/1/10/100/1000
- DC Ammeter 0/10
- AC Voltmeter 0/10/100/500/1000
- Ohmmeter 0/500/100,000/1 Meg

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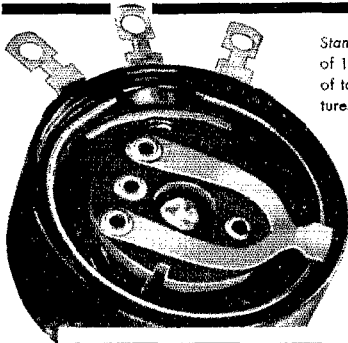
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★ Here's what you see when you slip the dust-proof protective cap off a Clarostat wire-wound control. A precision winding on bakelite strip; a positive, smooth, wear-proof contact; perfected lubrication; steel shaft properly fitted in brass bushing; obviously years of foolproof service. Why buy less?

Ask your local Clarostat jobber for these wire-wound controls. Ask for latest data. Or write direct to Clarostat Mfg. Co., Inc., 285-7 N. 6th St., Brooklyn, N. Y.



On the Ultra Highs

(Continued from page 56)

were made on Five via aurora — another indication that we should watch 2½ carefully this fall for possible aurora DX. And remember — location is relatively unimportant in this work. A 300-500 mile contact may be yours for some careful listening.

Mt. Greylock, the highest spot in Massachusetts, has seen plenty of portable activity on 2½ this summer. During the U.H.F. Roundup August 9th and 10th, W2HF, W2JAM, W2LSO, and W1KNC were all operating there simultaneously on 2½, with W1KUD going it on Five! Others from afar heard recently from this point include W3BZJ, W2LXO, W2MPY, and W2KLV.

The whole North Atlantic coast has been a bedlam of 2½-meter activity, but other places have been quite different! W3FDH and W3HPP-JLL recently took a trip through Ohio, Indiana, Illinois, Missouri, Kansas, Oklahoma, Arkansas, Tennessee, Kentucky, and West Virginia without hearing a single 2½-meter signal until they returned to Allentown, Pa.!

W6OIN, San Diego, has a pair of HK-24's crystal-controlled, running 100 watts. Ray has worked 53 different stations more than 90 miles distant. One contact, with W6NNN at Santa Barbara, 200 miles, represents the longest home-to-home work reported from the West. W6's OPM, MAK, and LQM have all been worked when they were mobile atop Mt. Frasier, 40 miles north of Bakersfield, a distance of 180 miles. W6's PPO and JCB also worked OPM on Mt. Frasier from Goat Mountain Lookout, 175 miles.

W5HYD/K6 at the Submarine Base at Pearl Harbor, Hawaii, has found quite a bit of activity in Honolulu, with K6's OTH, GQF, AGI, TXV, TYB, JPD, SNW, SMP, and W9AWC, W9GZS, and W5HYD among those present.

How about horizontals for 2½? The number is on the increase, and results seem to check with Five, except that under conditions of extreme bending (at least) there seems to be possibly more polarization shift on 2½. W6ANN has been using horizontal exclusively, in a territory predominantly vertical, and reports that in work beyond 100 miles there appears to be little discrimination noticeable.

W9CCY, Council Bluffs, Iowa, uses a 4-element "W6QLZ, Array" (see May QST) with just half of all dimensions, and is getting excellent results. Victor uses a polishing head (price \$1.19) and a 6¼-inch "V" pulley for clothealine control.

We have had a lot to say about DX on 2½. Now comes the shortest DX on record — W9DJF and W9JBS using self-contained portables in the back seat of W9NJB's car.

A.A.R.S. Activities

(Continued from page 86)

in the compilation and recording of the data from these questionnaires: Each was checked for completeness of information and then coded with a numerical code for each question that was not self-coding. The IBM numerical code was used for the city, county and state address. An IBM card-punching machine was used to record the coded information on individual punch-cards. A different operator using an IBM verifying machine checked the punched cards with their corresponding questionnaires for any errors. An IBM interpreter machine was used to print the call letters and the coded answers to the twenty questions on the top of each punch-card. A second set of punch-cards was reproduced for use of Corps Area Signal Officers by the IBM reproducing and interpreting machines.



WAR, apparently running down the call-book in reverse, worked W1NKW and W1NKV in succession. — W1NKW.

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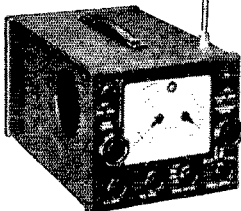
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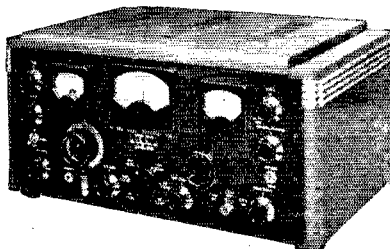
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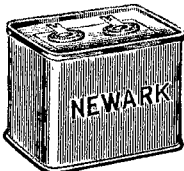
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... THEN
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(Continued from page 89)

one in the Huntington area who is interested and would like to join the net should get in touch with him. NFU finished rebuilding his 3-element beam. He also has been heard on 112 Mc. quite a bit lately. The net will operate on 56 Mc. in the latter part of October. At this time no change has been made in the operating frequency of the Section, but it will be made shortly. Any of the boys who would like to see the net operate somewhere in the 1.75-Mc. band should write in their views. It is very imperative that we have an established net going these times as in the past. Many thanks to those who have helped to keep it going these many years.

Traffic: W2SC 1589 (WLN 801) BO 463 BGV 237 LZR 176 (WLN 41) DBQ 154 DW 148 JZX 123 KI 96 AYJ 88 MY1 72 AZV 70 MZB 37 LYC 26 LGK 25 MT 18 LR 17 BCS 11 BWC 10 (WLNS 16) NDQ-KYV 10 IOP-IXZ-GP 9 MWT 8 BGO 7 FF 6 EC 4 ADW 3 CKU 5 AV-DOG-HGO-VG-IXX 1.

NORTHERN NEW JERSEY — SCM, Edward Gursky, Jr., W2LMN — PAM: W2LXI. RM's: 1YQ and CGG. LMN is to continue as SCM due to relaxation of business demands and failure of any nominating petitions being made. JUC is on the air again with new 250-watt rig and new receiver. CIZ has been kept pretty busy with his e.c. job but manages to get on 112 Mc. every now and then. After returning from a few weeks' vacation in Canada, MIG found a 1-A draft classification waiting for him, and now he's crowding in ham radio while he can. CRF is back on 160. IHR bought some property atop Juggtown Mountain (1200 feet elevation), and offers its use to UHF enthusiasts. MEU contacted 4DXP on 56 Mc. while on his boat cruising around Arthur Kill. MRJ has started real serious study on theory along with practicing on the mill. A new radio club has been formed using the name Garfield-Bergen Radio Assn. Club headquarters are in the city of Garfield's Administration Building, and they expect to play an important part in the defense activities of the city and Bergen County. Five UHF transmitters and receivers will soon be ready for emergency demonstrations and tests. Affiliation with ARRL is expected as soon as requirements can be met. Officers elected are as follows: HQ, pres.; MHL, vice-pres.; CNO, secy. and chief operator; NFI, treasurer; NHZ and NCC, assistant chief operators. Classes are held in theory and code. Any amateurs or prospective amateurs in the vicinity who are interested in joining should get in touch with Mel Stagg, W2CNO, 172 Third St., Passaic. Two members of the Inter-city Amateur Radio Club qualified for licenses and received the calls OAE and 3JQK. LEU, KMO, HAO and LMO have been active on 112 Mc. ODW is a newcomer and operates on 1.75 Mc. from Short Hills. The Bloomfield Radio Club is conducting two code and theory classes, one for beginners and one for those who are already hams. KXD resumed activity as NCS of the AARS 1.75-Mc. 'Phone Net. LKH is active on 1.75 Mc. with 15 watts to a 6L6. Up till now he has been on 7-Mc. c.w. NUG is another ham who is getting a taste of 'phone operation. LQN has joined the AARS 'Phone Net on 1.75 Mc. BYM has received confirmation of his 56-Mc. contact with 7ACD.

Traffic: W2MLW 463 CGG 364 JUU 159 NCY 158 MNT 157 (WLNW 50) BCC 141 IYQ 108 (WLN 38) KSR 94 ANW 75 MRJ 52 DAT/2 43 NPX 43 LMN 40 NJE 39 LFR 30 JKH 29 HCO 27 NAK 18 JUC 15 MNO 12 EKU 9 MIG 3. (June-July: W2IYQ 93 (WLN 13) JUC 12.)

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, Jerry Mathis, W3BES — 3FUJ is having plenty of fun working c.w. and is handling a lot of traffic. EML expects to be on the air more from now on. JBC has a new 812 final perking. DRO just returned from his vacation along Lake George and in Vermont. HFE spent two hours on 7 Mc. looking for one message. 8EU is packing and returning to civilization. Traffic is picking up at 3BXE, who now has an 807 running 100 watts. FXZ wants to get in a good traffic net. Who can help her out? She prefers long distance traffic. AGV, HXA and BES are all hot after their W.P.R. certificates. GHD received his DXCC certificate. FLH is back on the air again trying to get country number 100. 8UQM schedules 8GFD on 112 Mc. The new Eastern Pa. Traffic Net frequency is 3567 kc. 3AQN is on 1.75-Mc. 'phone every night to handle traffic. 3AKB will resume full schedules in September. INH runs 150 watts on 3.5 and 7 Mc. and 15 watts on 112 Mc. IJN, GET and DVC have just purchased NC81X receivers and are building up for the SS.

Traffic: W3FUJ 814 AOC 781 EML 2 JBC 13 FMF 54

8UQM 29 3AQN 37 3HFE 2 3INH 9 3AKB 10 3BXE 62 SOML 4 3DXC 7 3AGV 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Hermann E. Hobbs, W3CIZ — BWT made the biggest August total for his station. CDQ has DK-3 transceiver, spent two weeks in Mexico City and met W3APR as old DC ham of the 100 meter days. DRD has ironed out all the wrinkles in his rebuilding and is now ready for traffic. FFN took part in his first ORS party and reports a raft of fun. FE has a new SX-25 receiver and works in AARS net. HUM reports the AP-TL will resume operations Sept. 15th. JHW has moved to 154 Chesapeake St. S.W. and hopes to be on the air soon. 2MIY/3 has her e.c.o. perking again and joined AARS net. USA, formerly 3CXL, will be found on 3645 after Sept. 1st instead of 3680 kc. WLM on regular skeds and frequencies. There was a get together meeting at the Penn Hotel in Towson, Md. for the radio hams of the third CA on the afternoon of August 2nd. W3HAL/WLQA spoke on the CA working of AARS. The occasion was greatly enjoyed by all present.

Traffic: W3BWT 1103 CIZ 281 DRD-EKZ 3 FFN 11 FE 7 HUM 19 2MIY/3 9 PV 87 JFW 21 USA 1850 (WLM 3084).

SOUTHERN NEW JERSEY — SCM, Lester H. Allen, W3CCO — Ass't SCM and AARS Liaison RM, W3ZI — Regional Coördinator in charge of Emergency Coördination, W3BAQ — R.M.'s: 3BEI, BYR, ITU — PAM, 3EUH — Section Net Frequencies: OPS 1980 kc. (Thurs., 8 p.m. EST); ORS 3700 kc. (Tues., Thurs. and Sat. at 8 p.m. EST). Most outstanding happening this month was the DVRA outing and hamfest where 650 amateurs got together and had a swell time. The OPS boys defeated the ORS gang in a baseball game 20 to 5. All districts except W7 plus K6 and K7 were represented. 9CAC is visiting 3FMR. 3FXN recently married and the new QTH is 4374 North 43rd Street, Merchantville, N. J. Bob is completing a new antenna so that he can get back on 3.5 Mc. for traffic schedules. JPH is a new call in Wildwood. GNY is new member of the ORS Net. HYT is new member of the Basic AEC. GZS applied for OPS. HAZ has new e.c.o. and reports it working FB. ZI has been appointed chairman of the 10th Anniversary Banquet of the DVRA which will be held during October. EWK is doing a FB job handling traffic for Atlantic City. HPX schedules 20EN every evening. Anyone having Fort Monmouth traffic advise HPX. GCU reports that after Sept. 9th his OBS schedules will be on 3558 kc. Tues., Thurs. and Sat. at 1 a.m. EDST. DEA is proud papa of an 8½ pound YL. Congratulations. Andy. AEJ is doing swell job handling traffic on 1.75-Mc. 'phone. GNY moved rig from attic to basement and has new e.c.o. which works FB. ABS is looking for prospective members to join a proposed 56-Mc. 'phone net. FMR received qsl from KC4USA. Elmer will have a little more power this fall and is looking forward to being on the OPS Net. JBU threatens to try 56 Mc. while not busy with ORS schedules. GHR has been busy experimenting and changing rig around. 4EDD, 9ZJB and 3CJI were recent visitors at 3CCO and attended DVRA outing. 1MUW and 1HFO Treasurer of the Manchester Radio Club (N. H.) were visitors at 3AQ. 3GEV is rebuilding his beam for 28 Mc. 3EED is winding coils for 28 Mc. and expects to be on with 600 watts. GCU is having very fine results with his various message centers in the Trenton theatres. Ray says a good deal of the traffic is for boys at Army Camps. JNO has new half wave 1.75-Mc. antenna which works quite well. HTJ received WAS certificate for working all states on 1.8-Mc. 'phone. Congratulations. JOL and BAQ have Abbott 2½ meter transceivers installed in their cars and report very good results. HTL is now stationed at Trinidad, British W.I. BOI recently got new position and is now in Brooklyn, N. Y. EUH is rebuilding and will have a 100 wattter when completed. CKY is conducting field tests for the N. J. State Police on t.m. transmitters. ARN is now working for Western Electric and is only home on week-ends. Until next month, 73.

Traffic: W3B/X 227 HAZ 145 ZI 131 EWK 130 AVJ 92 OQ 90 AQ 75 CCO 51 HYT 46 HPX 42 ITU 39 GCU 29 AEJ 22 BEI 21 GNY 20 ABS 12 FMR 10 JBU 6 GHR 4 WLN 17.

WESTERN NEW YORK — SCM, Fred Chichester, W8PLA — RLI is on the air again working 3.5, 7 and 14 Mc. with 700 watts. RTB is again active after adding an X to the YL. DFN has new 250TH's. NOL is holding 112-Mc. schedules with WLI. GWO is building some new 56-Mc. f.m. equipment. ILO moved back to town and has been seen casting longing eyes at a new commercial-built transmitter.

EFO is with the Coast Guard at Puerto Rico. BKJ passed civil service exams and left to take government radio position. VQO has BCI trouble and since they made him remove his antenna from their house has been unable to get up a good skywire. TJJ has new suburban QTH and can at last put up decent antenna. Latest calls around Rochester: WME, WIF, WIJ and WIL. JIWH has worked his 47th K4. Howie has also worked 89 YL ops in 45 states. THC is putting in HY40's. His new rig will work all bands. NSL is still working DX on 1.75 Mc. VSP, located at new QTH, is on 1.75-Mc. 'phone. STD received class A. WFN enlisted in the Marines. VRP has left for Gallups Island. QDS is getting the bug again and will soon be on 3.5 Mc. CKY is working more DX on 14 Mc. than all the rest of the Syracuse boys put together. RYY is the last to leave the Syracuse NCR unit for active service. LYJ has been adding to his speech equipment. TEP is touring with his trailer. UKZ visited STA, BCU and the rest of the gang in the north country. SZB visited VE3GO at Kingston. KWS had just started to enjoy the last OPS Party when he blew a filter condenser. RKM is back on day shift and expects to be more active. VNQ and RGH are new ORS and OPS respectively. MU has been working fixed portable from Canandaigua Lake. Bill expects to take up his old ORS soon. MOI and WGG have built up a 7-Mc. rig for him and delivered it so JPP may soon be heard from the new QTH. The Batavia Club has obtained a 3/4 kw. gas-driven generator for their emergency apparatus. VFG applied for ORS. Your SCM would appreciate it a lot if you would send in news of your activities, to be included in this column. These items should be mailed not later than the fifteenth of each month.

Traffic: W8AOR 3 BJO 226 BLO 73 DII 44 DLU 10 EUY 6 FCG 72 DSS 30 JIWH 93 KYR 188 PLA 389 RMR 14 RVM 9 SMH 42 USX 13 UXT 157 VFG 48 VNQ 22.

WESTERN PENNSYLVANIA — SCM, E. A. Krall. W8CKO — Asst. SCM in charge of ORS activities. KWA. Asst. SCM in charge of EC, AVY — RM's: NCJ, TOJ, KUN. TDJ sends in the following report of net activities: Number of net sessions 23; total number of stations reporting for the net, 153; total number of messages handled, 183; average number of messages per net session, 8. This report shows a ten per cent increase in the number of messages handled and a thirty per cent increase in the number of stations reporting over the previous period ending July 15th. New coverage is provided by VYU at Greensburg and Oil City through a joint schedule of HKU and TOJ with VTK. BTQ moved to Sharon and resigned as EC for Allegheny County. PX is the new appointee for the job. NCJ has been making frequent contacts with K4HTU on 7296 kc. and handling some P. R. traffic. TOJ took part in the July ORS Party as RM exchanging messages with W. Pa. ORS members. TWI has been doing some experimenting. TTD is on the job at Export and we usually hear him on all net sessions. VYU is our new YL ORS from Greensburg. She is reliable and makes a good contact. FB, Theresa, and keep up the good work. UUZ is new OBS at Uniontown. KUN is getting into the net occasionally. KXP hopes traffic is heavy this coming season. RAT says NWE is rebuilding and will be on the air with plenty soup. RBI manages to be heard from once in a while. IOH is working 7 and 14 Mc. for the summer. CMP has been vacationing at Bayview, Mich. MJK sends in a good report as usual. MOT is now on active duty in Shore Patrol Section work. Over 550 attended the SHBPM hamfest. The W. Pa. ORS meeting was held at the hamfest and nearly the whole gang was there. Venango Mike and Key Club held a dandy hamfest at Polk, Pa. Several NCS of AARS attended a clam bake at Allentown, Pa. and had a good time. NCJ received favorable confirmation from Hq. regarding the use of 3590 kc. for the W. Pa. ORS net. Tentatively, the net will meet at 6:30 P.M. EST when the new frequency is used. All stations are urged to report into the present net as often as possible in order to handle any traffic coming their way. Our Asst. SCM in charge of ORS activities is now Lt. Wickenhiser in Hw. Co. of Home Guard unit. All amateurs are asked to report into an ORS net, whether they are an ORS or not. Just call the NCS and report in. He will line you up and give you any traffic going your way. This expedites the handling of the numerous messages going to and coming from the boys at camp. Listen for TOJ or NCJ on 3750 kc. from 5:30 to 6 P.M. EST.

Traffic: W8NCJ 194 KWA 194 TOJ 153 CKO 77 MJK 67 TWI 65 TTD 33 VYU 30 HKU 16 UUZ 16 KUN 9 KXP 7 BWP 6 RAT 5 RBI-IOH 3.

DELTA DIVISION

ARKANSAS — SCM, John R. Sanders, W5GNV — Asst. SCM, Ed Beck, W5GED — From the increase in inquiries reaching the SCM, it is apparent that most of the boys are beginning to think about fall activity. Requests for information on appointments have come in from all sides, and it looks like the heretofore unnumbered c.w. appointees are going to catch up with the 'phone boys. It sure does our heart good to see things shaping up so well this early in the season. With things happening thick and fast it behooves us to keep up the things as much as possible. With this in mind, here's the dope on our Official Broadcast Stations in this Section: W5GED, 1904 every Mon., Wed. and Fri. at 7 P.M.; W5BJR, every Tues., Thurs. on 1975. Both these stations run about 1/4 kw. GED is in Little Rock. BJR is in Pargould. These stations give our section fair coverage throughout the week. We hope to have more OBS in effective locations soon. FWD and HBW received visit from 6PIB. GWA took 'phone exam. HJA visited GED after a month of Army training at Ft. Sam Houston. KFA is a new ham on 1.75 Mc. at Augusta. Welcome, OM. KDP is new call at Truman and works on 7 Mc. at present. DYS is building new rack and panel job. FXO is back on with a temporary antenna. BCZ dropped in on GED. FDW is doing a nice job on 7 Mc., using '03A's final. CIU and XYL visited for a week in Little Rock recently. IDQ is remodeling for power increase. ENH is vacationing in Tulsa for a month before taking up the usual winter grind. INO is increasing power. EA puts in 2 1/2 hours a day on Army Net. DNX is also in the net, is rebuilding to 500 watts. He received visits from CPV and ICS recently. JIC is a live wire in the Ft. Smith area and is organizing a nice AEC setup there. IUE of Little Rock and Dallas is now located at Ft. Smith. HYS is about ready to go with new rig now that he has those long-sought filter chokes. JYU puts in all his time on 7 Mc. IYW applied for OBS and is experimenting with galvanized wire for antennas. HLW says he will be in Little Rock in September for the exams. AGT has a small rig on 1.75 Mc. at Pine Bluff. HSQ and BJR have gotten results on 112 Mc. HFP is considered the crystal grinding expert of N. E. Arkansas now. DZK is rebuilding after a long absence. HCP is with NYA at Newport now. EVD has a rig on. KAN is building up a new Thordarson Kit. GNV is working for KLRA now and hopes to have more time to work the "guys" since the new job is not so heavy on night work. The Ft. Smith Radio Club put on a hidden transmitter hunt the latter part of August. Keep the dope coming in on the 16th, fellows. 73.

Traffic: W5DNX 81 EA 11 GED 3 IYW-JIC 2 HLW 1.

LOUISIANA — SCM, W. J. Wilkinson, W5DWW — HQY is operating on the net frequency. IVZ is still bucking 1.75 Mc. DKR is on 14-Mc. 'phone with plans for 1.75-Mc. 'phone. HNW is going to try and promote some interest in 56 Mc. FSX is building rack and panel job. JRI is waiting for SX-25. JWI increased power to 100 watts. LUZ is on 1.75 Mc. IIH says woodpeckers have pecked holes in pole so he was off for awhile. JEV, HUY, JMK, HPW and INN have organized club and were active in Field Day. AKT is acting NCS for emergency 1.75-Mc. 'phone. HSN moved to Florida. JWX has 50-ft. vertical on 1.75-Mc. 'phone net. HSH received Class A. IYW is on 7 Mc. DAQ and IPC are both showing activity. EGG has moved to Vinton. HEJ visited the SCM. HEK is now ORS. HBY is OPS, also teaches radio at Camp Claiborne. KHC has just received ticket and will be heard soon. HIJ is keeping schedules on c.w. HPE has new rig. ECH is at Camp Walters, Texas. Ouachita Parish Amateur Radio Club elected DXL President, IDK Vice President, CNG Secretary and DRF Treasurer.

Traffic: W5HQY 8 DKR 16 HNW 63 HSH 3 IWY 11 EGG 8 HEJ 41 HEK 10 HBY 15 DWW 72.

MISSISSIPPI — SCM, S. Benton Cain, W5EGE — W5DEJ, alternate NCS, did a swell job handling net while the SCM was away on vacation. DFK was in Springfield, Mo., some time ago but is back and active again. KCE is a new ham in Hattiesburg on 1.75 Mc. EPY is again active on 1.75 Mc. at Starkville. EKV was acting NCS for 1.75-Mc. AARS net during July and August. JGP has swell signal on 1.75 Mc. at Biloxi. JTL expects to try reflector for his 1.75-Mc. antenna. BXG doesn't believe in Daylight Saving Time. Bill keeps his watch same as usual and sleeps through the FB morning QSO's of former days. JXK boosts power from 12 to 60 watts with nice increase in signal strength. HYN is active in Columbia. HAD spent two weeks in California recently and visited some of his 28 Mc. friends. HRX has been handling the La.-Miss. Storm Net.



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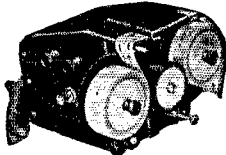
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Strays

For early beginners who are trying to memorize the code, I have found the following system of cards very helpful. There should be a card for each letter of the alphabet and the numerals. One letter or numeral is written on the side of each card and the code symbol on the other. The cards are then shuffled. Memory can be checked any time one has a few moments to spare.

— H. A. Brown.

To place QSL's on a cement wall, first cover the concrete with wall-paper paste. Then cover with desk blotters and let dry. The cards may be pinned or attached by tape to the blotters.

— W9CNL.

When Earl Olson of Grand Rapids, Minn. was married recently, the groom was W9UXK; best man W9VCH, and the minister W9UUF!

— W9QCP.

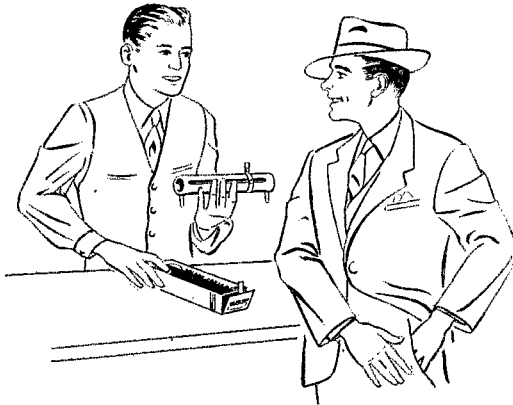
The Decade Calibrator

(Continued from page 25)

kc.; there should be a beat there also. Probably the last two beats won't be found, in which case go back to 1000 kc. and try another setting on C_{16} that will again give a beat note, then check 4000 and 5000 kc. again, and so on until all three beats are heard. Now turn on S_2 and turn S_5 to first one and then the other "on" position. Modulation should sound the same on both positions.

In normal operation, first let the heaters warm up thoroughly; 15 minutes is usually long enough to eliminate appreciable drift. Shut off the 1000-kc. oscillator (S_4) and zero beat the 100-kc. signal (on its 50th harmonic) against WWV. Go back to 1000 kc. and, with modulation on the 1000-kc. signal (S_4 and S_2 "on," S_5 to the right) zero beat the two local oscillators by adjustment of C_{15} . Disregard any beat which may be heard with a b.c. station operating on 1000 kc.

The frequency standard will put a marker signal on each of the band edges except the two ends of 160 and the two ends of the 20-meter 'phone band. Signals within about 5 kc. of any of our standard points can be checked by ear with the help of a piano or a pitch pipe. With the beat oscillator in the receiver off, compare the beat heard between the signal being checked and the standard to various notes on the piano, if one is available, or to any other source of a known musical tone. Reference to any physics handbook will give the frequency of musical tones, and the frequency of the audible beat either added to or subtracted from the standard signal's frequency (according to whether it is "high beat" or "low beat") will give the frequency of the unknown signal. With a little practice, readings can be made to a high degree of accuracy.



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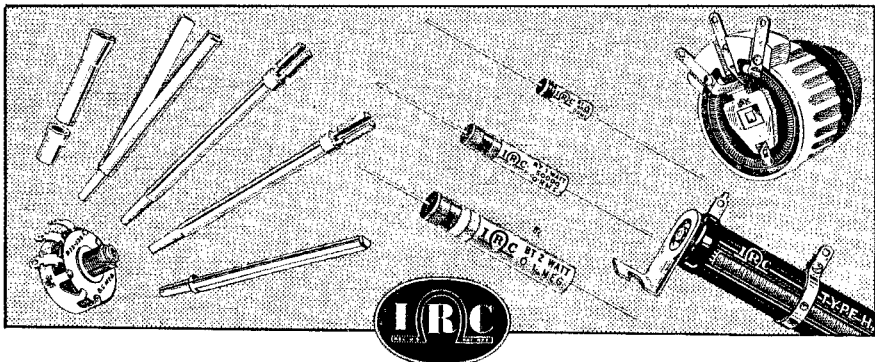
In the field of variable resistors, the record is much the same. Exclusive IRC Control features such as the positive coil contact between rotor shaft and center terminal, the 5-finger "knee action" element contactor, and the hard, smooth Metallized type element permanently bonded

to a moisture-proof phenolic base are positive assurance of quieter operation, longer life — and consequently fewer replacements for the man who uses them.

Going still further, the Tap-in shafts supplied for IRC's small Type D Universal Controls not only simplify control installations, they frequently enable you to use an inexpensive standard control on a job that might otherwise require a special unit.

And don't forget rheostats . . . All-Metal Rheostats pioneered by IRC drastically reduce operating temperatures, save space and weight, eliminate breakage and insure greater dependability.

Thus, while IRC fixed and variable resistors are selling faster today than ever before, it is only because more and more users in all branches of the electrical and electronics professions are insisting on having them.



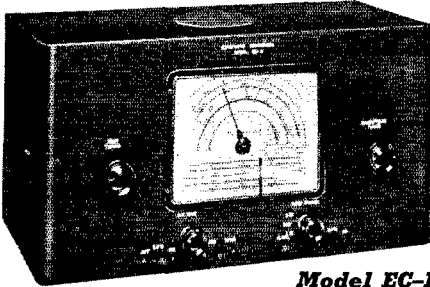
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In the case of a signal out of audible beat with any 100-kc. point, the process is a little more complicated. Turn the receiver beat oscillator on and tune in the unknown signal to exact zero beat. In most cases the tuning meter will no-show this kind of zero beat, so be careful and listen for a slow beat formed by variation of background noise as the b.f.o. and unknown signal alternately aid and buck. Note the dial reading on the receiver. Now similarly zero beat the nearest 100-kc. markers above and below the unknown signal, and note the dial readings. Subtract the dial reading for the low marker from the dial reading for the high marker, and divide into 100. This gives us kilocycles per dial division. Now multiply this figure by the number of dial divisions between the low marker and the unknown signal, and add the frequency of the low marker. The result is the frequency of the unknown signal, and the accuracy is usually limited only by the accuracy with which the receiver dial can be read, since this is, in most cases, much lower than the accuracy of the marker signals.

There will probably be some who doubt the accuracy of this method of interpolation. They will point out that no variable condenser is exactly "straight line frequency," which is quite true. However, it can be shown that for a semi-circular-plate condenser when the capacity in use is not too small, the change in frequency over $\frac{1}{10}$ or less of condenser rotation will be essentially proportional to rotation. The error here will be much less than the error or reading the dial. Now, for sets using electrical bandspread, particularly of the parallel-condenser type, the error introduced by considering frequency change as proportional to rotation of the bandspread condenser will be even smaller, by the ratio of change in total capacity to total capacity in the circuit. Thus, the method of interpolation outlined above will be valid for any case where the distance between adjacent 100-kc. markers is less than $\frac{1}{10}$ rotation (18°) of the main tuning condenser. The argument for tapped coil bandspread is similar. In any case, the dial divisions referred to are the equally spaced divisions on the "reference scale," not the frequency calibration on the receiver dial. If the receiver in use has shaped plates (and most of them do) the error will be still further reduced.

It will be noted that the output of the audio oscillator is brought out to a separate terminal. It makes a nice tone for feeding into the speech amplifier to get those pretty pictures on the oscilloscope. And the output can very easily be keyed for code practice or for i.c.w. work on 5 meters. Just put a key in series with the output jack. By the addition of a tap switch to connect various sizes of condensers at C_{22} , together with a variable condenser (a 3-gang b.c. tuning condenser with the gangs paralleled) for fine adjustment, we could have a variable audio frequency generator too. We did not go to that much trouble, since we have no particular use for a variable audio tone.

This unit will, as stated above, put a marker signal on all the band edges except 160 and

DX-QSA5-R4 to 6 - on 2½ METERS

What we believe to be a new 2½ meter DX record was established on August 21, 1941. Armand Gamache, W2MPY, of Montrose, New York, working mobile from Mt. Katahdin, Maine, with an ABBOTT MRT-3, worked WJFF of Newport, Rhode Island, a distance of approximately 335 miles.

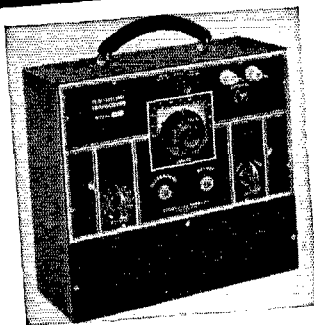
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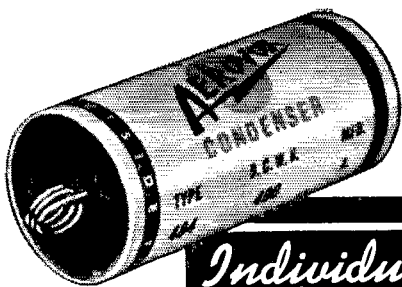


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the ends of the 20-meter 'phone band, which can be found by interpolation on the receiver dial. It therefore will comply with the F.C.C. rules which only require means to insure that the transmitting frequency is inside the band. Properly used it will measure frequencies with a high degree of accuracy. Ours cost just \$1.17, not including cabinet; we had to buy the chassis, R_1 , and S_5 , the rest came from the junk box and from old b.c. sets we inherited from the ash can. Others may not be quite so lucky, but it should be possible to build the unit for less than \$10, plus a little help from the junk box. Cost of new parts is \$12.05. Isn't that cheap for frequency insurance?

Election Notices

(Continued from page 28)

of the machinery of self-government in ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. Members are urged to take the initiative and to file nominating petitions immediately.

For the Board of Directors:

K. B. WARNER,
Secretary

A Lecher Wire System

(Continued from page 19)

allows the block to slide freely, the wires being pressed down on the bar only when an actual reading is to be taken. A small piece of wood held in the hand can be used for pressing them down, and it is an easy matter to regulate the pressure so that free movement is secured. It would be relatively simple to arrange a spring device for the same purpose.

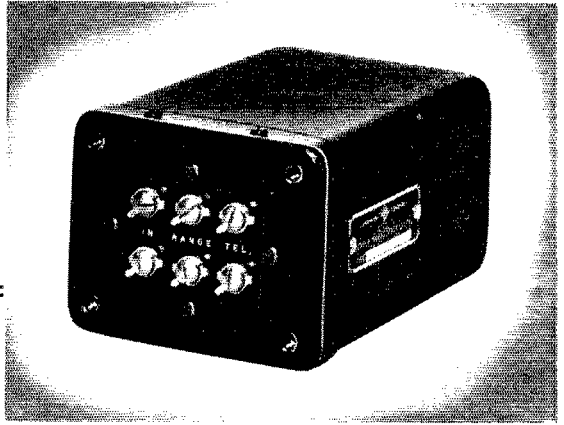
As it is convenient to measure lengths directly in the metric system used for wavelength rather than in inches, the top of the "T" beam has been marked off in decimeter (10-centimeter) units. Since the photographs were taken a 10-centimeter transparent scale (also obtained at the five-and-ten) has been cemented to the slider, extending out from the front, so that readings can be taken to the nearest millimeter. Thus the difference between any two readings on the scale gives the half wavelength directly.

The "T" beam will tend to bow outward if the turnbuckles are tightened too much, which will bend the scale slightly out of parallel with the wires. It is best to use just enough tension to keep the wires fairly taut, but not enough to put an appreciable bend in the wooden member. This makes the slide move more freely and also helps avoid small errors in measuring the length.

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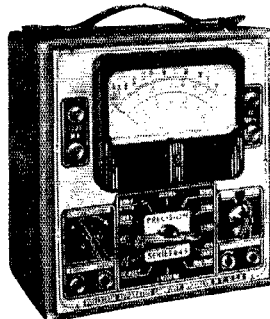
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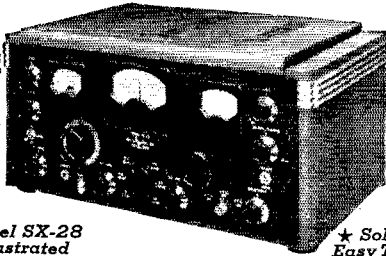
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of energy, if accurate wavelength measurements are to be obtained. Really loose coupling requires a highly sensitive resonance indicator — preferably one which will give a good indication with so little energy that it has practically no reaction on the oscillator being measured. For checking transmitters the absorption wavemeter described in July *QST*² will meet this specification, needing only to be supplied with one more coil to cover the 112-Mc. band. A satisfactory coil will consist of $\frac{3}{4}$ turn each for L_1 and L_2 , with about a half inch separation between them. The 112-Mc. band will be found near minimum capacity on C_1 with such a coil.

The measurement procedure using the wavemeter as a resonance indicator involves very few additional operations. First tune the meter to resonance as indicated by maximum milliammeter reading, then move it as far as possible from the transmitter while still getting a reading of the order of 25% of maximum on the most sensitive scale (with the shunt switched out). Then couple the loop at the end of the Lecher wires to the wavemeter coil and take a trial setting of the shorting bar. The resonance point will be given by a sharp dip in the meter reading. Pay no attention to slow variations as the bar is slid along; these simply mean that some detuning of the wavemeter circuit is taking place. The resonance dip will be quite pronounced and the bar should not have to be moved more than a half inch or so to go completely through it. Once it is identified, loosen the coupling between the wires and the wavemeter circuit until the dip is just a small downward kick in the reading. From this point on the measurement procedure is the same as before. By this means it is possible to avoid detuning of the oscillator by the lines, some amount of which usually takes place even with loose coupling when the line is coupled to the oscillator itself. This occurs because of the necessity for abstracting an appreciable amount of energy from the circuit to get a good resonance indication from a flashlight lamp or similar device. With the crystal-detector wavemeter, it is usually possible to work at least a foot or two from even a low-power oscillator.

Using this method of measurement, we have been able to determine the frequency of a crystal-controlled 112-Mc. transmitter to within 100 kilocycles of the known frequency, in repeated measurements by different observers. Since such a deviation represents about a millimeter in measurement it can be appreciated that the attainable precision in determining the resonance points is quite high. It seems that the limit is likely to be the possible precision in measuring the length, which of course is fundamentally a question of how accurate the measuring stick is. At any rate, there is no doubt that sufficiently good frequency measurements can be made with Lecher wires provided due care is used in making them; if the results are wrong the odds are pretty high that the operator is to blame rather than the equipment.

— G. G.

² "A Sensitive Absorption Wavemeter," *QST*, July, 1941.

QST

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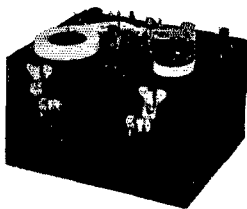
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Around the World With the Yankee

(Continued from page 14)

Al Jackson, W1NI, in West Hartford, also helped us with contacts from time to time. In addition several contacts were made with W9DWD, W2FA, W2FJ and others who very kindly offered their services.

Soon after the *Yankee* left on its world trip, my wife decided that she would take up ham radio. With the help of Al Carr, W1LOH, Al Jackson, W1NI, Pat Clancy, W1BAH, and several of the other hams around Hartford she managed to get her ticket in January, 1941, with the call W1NDT although she had absolutely no knowledge of radio beforehand. Pat Clancy built up a "fool-proof" transmitter for her, and during the last part of the trip I was able to talk directly home.

The two most important factors in maintaining schedules were picking the correct times and frequencies and the antenna systems used. When we were in the open ocean WCFT could put out a pretty consistent signal, but if we were in the vicinity of an island with the land between us and W1AW our signal would drop off sharply. In receiving, the rhombic was of great aid to W1AW; several times they could copy us when W1NI could just barely hear our signal. The exact times of schedules was also very important. Near Singapore there was only a small period of the day, usually about sunrise in the United States, when the 40-meter signals would get through.

Although not much traffic was handled with the commercial stations, we always found them very obliging. Amateurs can learn much from the clean-cut traffic handling done by the commercials. Some idea of their problem can be had by listening to them during a busy period. At Christmas time last year, the RCA station WCC had 108 ships on their traffic list and WSL, the Mackay station, had 78. This meant that the stations had to be handling three or four boats at the same time, as there were a corresponding number of messages coming from the vessels. Three or four operators would be employed on the same frequency, all keying the same transmitter. Even with all the traffic, the commercials never tried to rush a message, realizing that sending the message once at a reasonable speed was better than a series of repeats. Everywhere we went we found the commercial operators always glad to see us and offering to QSP for us at any time.

Another interesting point that was noticed on the trip is that when we were within 5 degrees of the Equator, either north or south, signals on all frequencies fell off sharply, and around noon there was almost a complete fade-out.

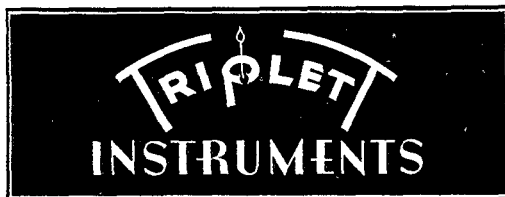
The transmitter carried on the present trip was built by Eurich and was designed to combine efficiency with stability and ruggedness. Brass was used throughout to minimize corrosion by

Where to buy it

A directory of suppliers who carry in stock the products of these dependable manufacturers.



ALBANY, N. Y. Uncle Dave's Radio Shack 356 Broadway
 ATLANTA, GEORGIA Radio Wire Television Inc. 265 Peachtree Street
 BOMBAY, INDIA Eastern Electric & Engineering Company
 BOSTON, MASS. Radio Shack 167 Washington Street
 BOSTON, MASS. 110 Federal Street
 Radio Wire Television Inc.
 BRIDGEPORT, CONN. 177 Cannon Street
 Hatry & Young, Inc.
 BRONX, N. Y. 542 East Fordham Rd.
 Radio Wire Television Inc.
 BUFFALO, N. Y. 1531 Main Street
 Dymac, Inc.
 BUTLER, MISSOURI 211-215 N. Main Street
 Henry Radio Shop
 CHICAGO, ILL. 833 W. Jackson Blvd.
 Allied Radio Corp.
 CHICAGO, ILL. 901-911 W. Jackson Blvd.
 Radio Wire Television Inc.
 CINCINNATI, OHIO 1103 Vine Street
 United Radio, Inc.
 DETROIT, MICH. 325 E. Jefferson Ave.
 Radio Specialties Co.
 DETROIT, MICHIGAN 11800 Woodward Ave.
 Radio Specialties Co.
 HARTFORD, CONNECTICUT 227 Asylum Street
 Radio Inspection Service Company
 HOUSTON, TEXAS 1021 Caroline Street
 R. C. & L. F. Hall
 INDIANAPOLIS, INDIANA 34 West Ohio Street
 Van Sickle Radio Supply Co.
 KANSAS CITY, MO. 1012 McGee Street
 Burstein-Applebee Company
 LITTLE ROCK, ARKANSAS 409 W. 3rd Street
 Beem Radio Company
 NEW HAVEN, CONN. 1172 Chapel Street
 Hatry & Young, Inc.
 NEW YORK, N. Y. Harrison Radio Co. 12 West Broadway
 NEW YORK, N. Y. 100 Sixth Ave.
 Radio Wire Television Inc.
 NEWARK, N. J. 24 Central Ave.
 Radio Wire Television Inc.
 READING, PENN. 404 Walnut Street
 George D. Barbey Company
 SCRANTON, PENN. 519-21 Mulberry Street
 Scranton Radio & Television Supply Co.
 WASHINGTON, D. C. 938 F Street, N. W.
 Sun Radio & Service Supply Co.



ALBANY, N. Y. Uncle Dave's Radio Shack 356 Broadway
 ATLANTA, GEORGIA 265 Peachtree Street
 Radio Wire Television Inc.
 BOSTON, MASS. Radio Shack 167 Washington Street
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 Radio Wire Television Inc.
 CINCINNATI, OHIO 1103 Vine Street
 United Radio, Inc.
 HARTFORD, CONN. 203 Ann Street
 Hatry & Young, Inc.
 LITTLE ROCK, ARKANSAS 409 W. 3rd Street
 Beem Radio Company
 MINNEAPOLIS, MINNESOTA 1211 LaSalle Avenue
 Lew Bonn Company
 NEW HAVEN, CONN. 1172 Chapel Street
 Hatry & Young, Inc.
 NEW YORK, N. Y. 100 Sixth Avenue
 Radio Wire Television Inc.
 NEWARK, N. J. 24 Central Ave.
 Radio Wire Television Inc.
 READING, PENN. 404 Walnut Street
 George D. Barbey Company
 WASHINGTON, D. C. 938 F Street, N. W.
 Sun Radio & Service Supply Co.

Listings on this page do not necessarily imply endorsement by QST of the dealers or of other equipment sold by them.



The LOW-PRICED communication receiver that is so popular, especially with men in the services.

Echophone COMMERCIAL

EC-1

COMPLETE

\$24.50

- Three Bands
- PM Speaker
- Six Tubes
- AC-DC-115/125 volts



Electrical bandspread on all bands. Beat frequency oscillator. Bandspread logging scale. Isolation for headphones through phone circuit transformer. Dial calibrated in megacycles with service bands indicated.

All Other Communication Receivers

- ★ HALLICRAFTERS... all models in stock now for immediate shipment.
- ★ HAMMARLUND... "HQ-120-X" and the "SUPER PRO"... both available immediately.
- ★ NATIONAL, ★ HOWARD and other recognized makes are now on hand.

CAMERAS and CAMERA ACCESSORIES

... are in a separate department, but attractive trade-in allowances or "swap" deals can be arranged on camera for radio or radio gear for camera equipment. What have you?

W2IIL • W2LJA • W2PL • W2KWY

OUR *Best* VALUE IS OUR RECORD OF LOYAL SERVICE

HARVEY

Radio Company of New York

103 WEST 43rd STREET • NEW YORK, N. Y.

CABLE ADDRESS: "HARADIO"

salt air and spray, and the construction was made as heavy as possible. An RCA 803 was used in an electron-coupled oscillator circuit with an input of approximately 200 watts. The oscillator circuit was operated at half the desired frequency and the harmonic taken in the plate section in order to maintain stability and minimize frequency changes due to the swinging of the antenna. An ingenious "plug-in" coil drawer with pre-tuned circuits was provided so that the transmitter could be changed instantly for use on the intermediate ship wavelengths of 600 to 800 meters and the short wavelengths of 18, 24, 27, 36 meters. Since 36 meters was found to be by far the best all-around wave, it was used about 90% of the time. W1AW's signal on 40 meters was consistently good practically the whole way around, and American stations were heard much more often on 40 than on any other band. Signals on 14 Mc. would be very good one night and practically non-existent the next night. I believe that the antenna systems had much to do with this as we would hear one amateur every night while we were in one locality and then when we moved another amateur's signal would become the outstanding one.

Power for the transmitter was furnished by a motor-generator running off the ship's 110-volt bank of storage batteries. This furnished 110 volts of 500 cycle a.c. which was stepped up and rectified by 866's to furnish 2000 volts for the 803. The 110-volt a.c. was also stepped down for use on the filaments. In consequence none of the filaments of the tubes were lit until the generator was started and transmission always began with cold tubes. When the ship's batteries were low the line voltage would be down to around 95, with corresponding lowering of the filament voltages. Yet in the year and a half of operating no trouble of any kind was experienced.

The receiver was my own HRO which was changed over for 6-volt operation and was used with a storage "A" battery and "B" batteries. A vibrapack was purchased in Singapore and was used instead of "B" batteries for the last part of the trip, and it worked very well.

The antenna, always a problem on a sailing vessel, was a single vertical wire running from the deck to the cross trees of the mainmast. The length to the set was approximately a half wave on 36 meters, and it worked out remarkably well. Of course, on 600 meters it had to be loaded so heavily in the cabin that not very much was radiated. Nevertheless, the results were satisfactory for our use as our only 600-meter contacts were with passing ships and with coastal stations when we approached a port.

In conclusion, I wish to thank the many amateurs and commercial operators that we met on the trip and over the air from home for their kindness and coöperation. It has been impossible to name every one of them in this article, but their hospitality and help will always be remembered.

★ It's **HARRISON** for **HAMMARLUND** and **SERVICE!**

PRICES?

No matter what happens to prices—here at Harrison our large scale purchasing and our tremendous stock enable us to continue to give you the lowest possible prices at all times.

It pays to buy from Harrison!



DELIVERY?

With production facilities already greatly over-taxed, deliveries are falling behind more every day. But, we anticipated this "Back-order Era" and placed protective orders many months ahead. Right now we have more receivers, parts, tubes, etc. *on hand* than at any time in our busy sixteen year history!

You get faster delivery from Harrison!



TRIAL?

When you buy anything from Harrison it has to be entirely satisfactory or you don't keep it. Try out your next receiver for ten days without charge or obligation by ordering it from us.

You get 100% cooperation from Harrison!



TRADE-IN?

By fair dealing we have built up the largest Reconditioned Receiver business in the world! We have a ready market for your old set, and that means we can give you the very best trade-in allowance. (We also buy receivers, transmitters, etc., for cash.)

You get the best deal at Harrison!



TERMS?

Certainly! Charge Account or Easy Payment Plan. Buy your Receiver, transmitter, parts, etc., on our easier terms at lowest cost.

Your credit is good at Harrison!



GUARANTEE?

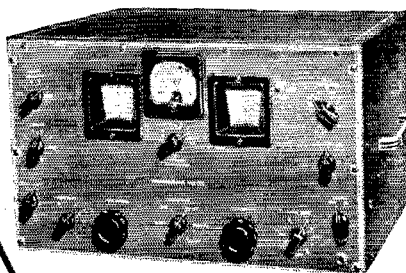
Everything is "guaranteed," but your best guarantee is the integrity of the person with whom you deal. Here at Harrison we go far beyond the standard warranty in order to please you!

You get a square deal from Harrison!



I'll be looking for your order!

73,
BILL HARRISON, W2AVA



HAMMARLUND HQ-120-X

A world famous receiver! Strictly up to the minute with the kind of performance required by the exacting professional, amateur, or short wave listener. Dual stabilized with electronic voltage regulation and drift compensation! Twelve tubes, high gain RF stage, antenna trimmer, three IF stages with silvered condensers and permeability tuned transformers. Covers 9.7 to 555 meters in six bands with calibrated bandspread.

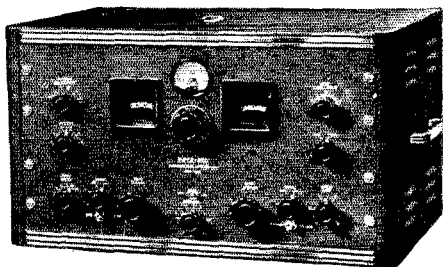
Harrison has it — in stock!



*[Send for latest list
of New and Re-
conditioned Sets]*

The **HAMMARLUND** **"SUPER-PRO"**

One of the most desirable communications receivers available today! 18 tubes, improved noise limiter, two stages of preselection, superb audio quality, and many other features that make it "tops." *Two models:* 15 to 550 meters, or 7 $\frac{1}{4}$ to 240 meters.



★ ★ ★
HARRISON RADIO CO.

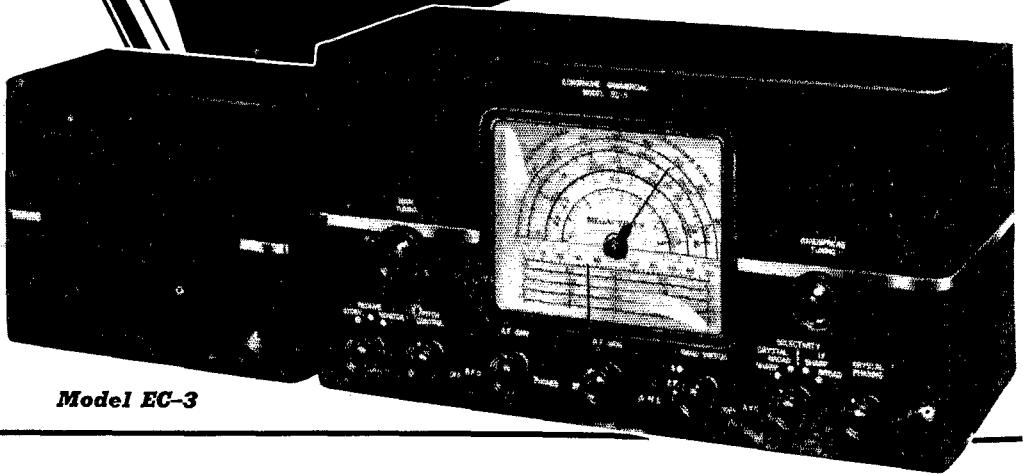
12 WEST BROADWAY • NEW YORK CITY

WOrth 2-6276

★ ★ ★

Echophone COMMERCIAL

"The Ears of the World"



Model EC-3

Now you can buy all these communications features at moderate prices. Echophone, Model EC-3: Crystal filter (four position variable selectivity). Calibrated bandspread, automatic noise limiter. Preselection on all bands. Two stage IF amplifier. Fly-wheel tuning. Separate 6"

PM speaker housed in matching cabinet. CW monitor. 10 tubes. 3 bands. Covers from 550 to 2100 kc. — 2.1 to 8.1 mc — 7.9 to 30 mc. Electrical bandspread. Operates on 115 volts AC/DC.

Echophone (Model EC-3)
\$59.50

Echophone COMMERCIAL

"The Ears of the World"

ECHOPHONE RADIO CO., 201 EAST 26th ST., CHICAGO, U.S.A.

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 15¢ 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 25th 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 takes 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 15¢ rate. Provisions of paragraphs (1), (2), (4) and (5) apply to all advertising in this column regardless of which rate may apply.

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 advertised

QUARTZ — direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

QSL'S, Cartoons. Free samples. Theodore Porcher, 7708 Navajo, Philadelphia, Pa.

CALLBOOKS — Fall edition now on sale containing complete up-to-date list of radio hams throughout entire world. Single copies \$1.25. Canada and foreign \$1.35. Radio Amateur Call Book, 610 S. Dearborn, Chicago.

COMMERCIAL radio operators examination questions and answers. One dollar per element. G. C. Waller, W5ATV, 6540 Washington Blvd., Tulsa, Okla.

QSL'S — Brownie, W3CJI, 1725 Frankfield Ave., Allentown, Pa.

TELEPLEXES, Instructographs bought, sold. Ryan's, Hannibal, Mo.

QSL'S, SWL'S. 100 — 3 color — 75¢. Lapco, 344 W. 39th, Indianapolis, Ind.

1000 watt G.E. transformers 1100-2200-4400 volts each side c.t. Guaranteed \$13.50. Dawson, 5740 Woodrow, Detroit, Mich.

QSL'S & SWL'S — Fritz, 1213 Briargate, Joliet, Ill.

NEW England Division A.R.R.L. Convention, Boston Hamfest, Hotel Bradford, Boston, October 18.

TWO modern transmitters, bargains, 300 watt CW, 250 phone. W2JBW.

CRYSTALS, commercial or amateur: police, marine, aircraft, defense projects, etc. A complete line of dependable crystal units is available for commercial services. Over a period of years, Eidson commercial crystals have a record of 70.7% repeat sales — satisfaction set that record. Send for catalog. Amateurs: those unbeatable T9 40 and 80 meter crystals still sell for \$1.60. T9 spot frequencies 40 or 80 meter bands \$2.50 or \$3.60 with holder. Order from Eidson's, Temple, Texas, or dealers previously listed. Wanted: Experienced crystal grinder, write us.

QSL samples, prices on request. W2AEY, 338 Elmora, Elizabeth, N. J.

SELL: RTL model TR112 2½ meter transmitter, receiver, power supply, \$30. Portable transmitter, 6C5, 6L6, TRF receiver, a.c. power supply, 300 watt vibropack, \$30. f.o.b. Detroit. Dr. Grant, W8NXT.

WRITE Bob Henry, W9ARA, for best deal on all amateur receivers, transmitters, kits, parts. You get best terms (financed by myself); largest trade-in; personal cooperation; lowest prices; prompt shipment from world's largest stock amateur receivers and parts. Immediate shipment NC-200 and all makes and models receivers. Let's get acquainted. Write us for anything. Henry Radio Shop, Butler, Mo.

NEW Mac \$7.50 bugs \$4.50 on approval. Special prices on several makes amateur receivers. Code machines rented. A.C. or spring wound. Lowest and best rates. Write. W9ARA, Butler, Mo.

RECONDITIONED guaranteed amateur receivers and transmitters. All makes and models cheap. Free trial. Terms. List free. Write. W9ARA, Butler, Mo.

NEW England Division A.R.R.L. Convention, Boston Hamfest, Hotel Bradford, Boston, October 18.

QSL'S? — SWL'S? — Biley crystals? Patronize the ham. Samples? W8DED, Holland, Mich.

SELL — QST's January 1924 to December 1939 inclusive, in good shape. Also brand new unused Eimac 75T, Amperex 80L, Guardian X100 overload relay. Best offer. W6PCA.

SELL — Hickok RFO-5, 180-X generator. Like new, best cash offer. Also Riders 10 & 11, Solar BQC, RCP 411, 504, Jackson 634-D, cheap. write: E. C. Heysek, 1st Bn. Hqs., 30th A.R., Pine Camp, N. Y.

QSL'S — SWL'S. Colorful, economical. W9KXL, 819 Wyandotte, Kansas City, Mo.

SELL — Hallcrafters HT6 transmitter with coils and ECO units for all bands. Used less than 6 months. \$120 or best offer gets it. W9RSN, Robert Hill, 401 E. 15th St., Anderson, Ind.

NEW England Division A.R.R.L. Convention, Boston Hamfest, Hotel Bradford, Boston, October 18.

FOR sale: new RCA transmitting tubes in original cartons at a bargain price, send stamp for list. Lowell Ecker, Sedan, Kansas.

QSL'S. Finest. Samples. Maleco, 1805 St. Johns Place, Brooklyn, N. Y.

85 watt transmitter, 100 watt modulator, complete, excellent condition, \$85. W3HHE.

WANT latest model complete HRO or Super Pro. Lieut. Macy, AFRTC, Ft. Knox, Ky.

NATIONAL NTX transmitter, extra holder, eight crystals; matching NSM modulator both perfect, like new; cheap, quick. W2WD.

PRACTICALLY new kilowatt transmitter — phone and CW. Heavy duty parts. A good bargain for any ham who wishes to invest in a complete kw. or kw. amplifier. Write for details. WILUN, Theodore C. Hamlin, Newtown, Conn.

SELL — complete Rider's III, V, VI, VII, index; incomplete combination type Vol. I; \$18. Baier, 202 Riverside Drive, N. Y. C.

NEW England Division A.R.R.L. Convention, Boston Hamfest, Hotel Bradford, Boston, October 18.

NEW transmitting kits all phone and CW from 15 watts through 150 watts. Also new ECO unit for \$35. New 40 meter phone transmitter reasonable. Also plenty of 40 meter crystals. Write for details today. Leo, W9GFQ.

RECEIVERS — all types — new and reconditioned. Easy terms. Free trial. Send for big list and other specials. Get acquainted with Leo, W9GFQ.

TRANSMITTING headquarters on latest Stancor, Thordarson and other kits — commercially priced at low cost. New 70 watt transmitter kits complete only \$35. — speech amplifier modulator up to 80 watts at \$25 — up to 150 watts \$49.50. New HY25's at 99¢. New HY51's at \$2.95. Easy terms. Write Leo, W9GFQ, today.

LEO, W9GFQ, offers the hams more and a better deal always. Lowest terms without red tape on all new and used equipment. Free trial, personalized service. Write for big free ham bargain catalog and used receiver list. Wholesale Radio Labs., Council Bluffs, Iowa.

CRYSTALS: famous P.R., mounted in latest Alsimag 35 holders — 40, 80 meter PR-X, 160 meter PR-Z \$3, 40, 80 meter PR-Z (low drift) \$3.50; 20 meter PR-20 \$4.50; unconditionally guaranteed. Immediate shipment. Quality blank 70¢. Wholesale Radio Labs., Council Bluffs, Iowa, W9GFQ.

SWAP or sell — Weston model 372 capacity meter, zero to 3 μ d, \$50 — Jas. Biddle Meeger zero to 100 megohms \$50 — RCA TMV-122B 3' scope \$50 — General Rotary 3 element 10 m. beam everything \$60 — Pioneer 400 watt 110 a.c. gas driven generator \$40 — General Radio absorption frequency meter \$10 — Gross Eagle receiver (new) \$10. **WANT** Hallcrafters S27 receiver or HT6 phone — Abbott DK3 or MRT3 — Jensen Bass reflex speaker — DM36 or good 2½-5 m. converter — Zeiss Contax II or Leica camera — good 35 mm. still projector — wide angle or telephoto lens for Contax II — or what have you? Lou Springer, W8BGV, Auburn, N. Y.

CRYSTALS for all bands but 10. Write your wants and for prices. W8KJ.

USED Thordarson — Standor — UTC parts A-1 condition for sale. Also various types transmitting tubes. Send stamped addressed envelope for list to W8ICQ, Piqua, Ohio.

TRANSMITTER 150 watts CW complete, new, best of parts: \$60 takes it. W3ASQ.

EMERGENCY portable power — 750-watt, 110 a.c. 60-cycle. Engine, new Wisconsin; generator newly wound on Dodge 12 v. frame. Ready to run — requires one 6-volt storage battery. Complete with automatic governor, muffler and meter panel; fully shielded and filtered. Net wt. 252 lbs — \$169. A. Gilbert Moore, W1LPJ, Sharon, Mass.

BRIDGE Universal a.c. RCA type TMV-132-A, DuMont frequency modulator tube 15L. QST's November 1929 to December 1940, all or part. Make offer. W2DRK.

NEW England Division A.R.R.L. convention, Boston Hamfest, Hotel Bradford, Boston, October 18.

CRYSTAL-swap Hamads should use the following standard form. Simply say: the frequency of your crystal, its make and type, the frequency (or between what frequencies) you want, your call. For instance: **1890 Biley LD2 — 1817-1823. W1KH.** means W1KH has an 1890 kc. Biley type LD2 he wants to swap for some crystal between 1817 and 1823. For so long as there is considerable demand for crystal-swap Hamads, this explanation will appear each month.

The Radio Amateur's **HANDBOOK**

THE HANDBOOK tells the things which are needed for a comprehensive understanding of Amateur Radio. From the story of how Amateur Radio started through an outline of its wide scope of the present — from suggestions on how to learn the code through explanations of traffic-handling procedure and good operating practices — from electrical and radio fundamentals through the design, construction, and operation of amateur equipment — this book covers the subject thoroughly. It includes the latest and the best information on everything in Amateur Radio.

\$1 **POSTPAID**

\$1.50 Outside Continental U. S. A.

Buckram Bound \$2.50 Postpaid

Spanish Edition \$1.50 Postpaid

AMERICAN RADIO RELAY LEAGUE, WEST HARTFORD, CONN.

Your Nearby Dealer Is Your Best Friend

Your nearby dealer is entitled to your patronage. He is equipped with a knowledge and understanding of amateur radio. He is your logical source of advice and counsel on what equipment you should buy. His stock is complete. He can supply your needs without delay. His prices are fair and consistent with the high quality of the goods he carries. He is responsible to you and interested in you.

One of these dealers is probably in your city — Patronize him!

ATLANTA, GEORGIA

Radio Wire Television Inc.
265 Peachtree Street
"The World's Largest Radio Supply House"

HOUSTON, TEXAS

R. C. & L. F. Hall
1021 Caroline Street (C 0721)
"Specialists in Amateur Supplies"

BALTIMORE, MARYLAND

Radio Electric Service Co.
3 N. Howard St.
Everything for the Amateur

NEWARK, N. J.

Radio Wire Television Inc.
24 Central Avenue
"The World's Largest Radio Supply House"

BOSTON, MASS.

Radio Wire Television Inc.
110 Federal Street
"The World's Largest Radio Supply House"

NEW YORK, N. Y.

Radio Wire Television Inc.
100 Sixth Avenue
"The World's Largest Radio Supply House"

BUFFALO, NEW YORK

Radio Equipment Corp.
326 Elm Street
W8PMC and W8NEL — Ham service and sound equipment

NEW YORK, N. Y.

Harrison Radio Company
12 West Broadway
Harrison Has It! Phone WOrth 2-6276 for information or rush service

BUFFALO, NEW YORK

Dymac, Inc.
1531 Main Street — Cor. Ferry
One of the Largest Ham Supply Houses in Western New York
GA. 0252

PHILADELPHIA, PENNSYLVANIA

Eugene G. Wile
10 S. Tenth Street
Complete Stock of Quality Merchandise

HARTFORD, CONNECTICUT

Radio Inspection Service Company
227 Asylum Street
What do you want? We have it. Radio exclusively

PROVIDENCE, RHODE ISLAND

W. H. Edwards Company
85 Broadway
National, Hammarlund, Hallicrafter, Thordarson, Taylor, RCA

HARTFORD, CONNECTICUT

Hatry & Young, Inc.
203 Ann Street
Stores also in Bridgeport and New Haven

SCRANTON, PENNSYLVANIA

Scranton Radio & Television Supply Co.
519-521 Mulberry Street
Complete Stock of Quality Amateur Supplies

YOU CAN BE SURE
WHEN YOU BUY FROM

QST

ADVERTISERS

“Advertising for *QST* is accepted only from firms who, in the publisher’s opinion, are of established integrity and whose products secure the approval of the technical staff of the American Radio Relay League.”

Quoted from QST’s advertising rate card.

Every conceivable need of a radio amateur can be supplied by the advertisers in QST. And you will know the product has the approval of the League’s technical staff

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DO YOU WANT A BETTER RECEIVER?

If you do, we should get acquainted. I'm Bob Henry, W9ARA, at Butler, Missouri in the "Heart of America" where I can serve all the USA easily and quickly. I sell more amateur receivers than anyone else in the world, because I really make it to your advantage to buy from me. I have the biggest stock of all makes and models. I personally cooperate with you to help you get the best receiver for your use and to see that you are 100% satisfied. I will give you a trade-in on your receiver that will make your eyes pop. I finance all terms myself so I can give you a better break (write me for proof that my terms are the best of all). I ship everything on a ten-day free trial. Drop me a line. Tell me what you want; what you have to trade-in; what terms you want arranged. We can help each other.

Let's get acquainted

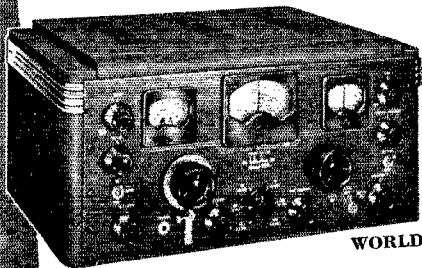
Bob Henry

W9ARA

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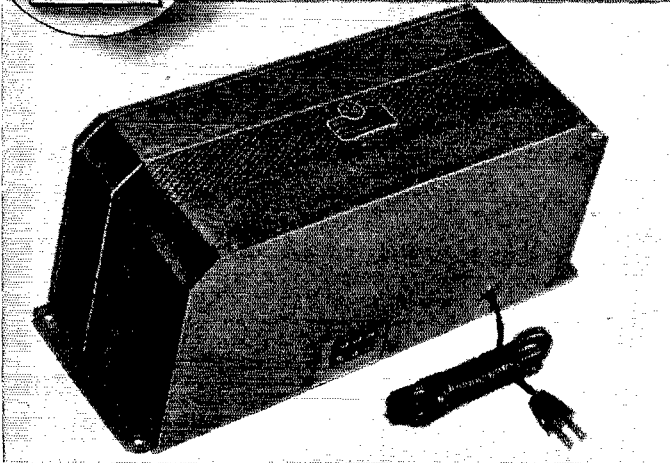
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The UTC automatic voltage regulator is NEW. It involves no moving parts and effects instantaneous correction for either transient or chronic line voltage fluctuations.

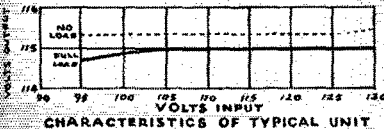
STANDARD TYPES

Type No.	Capacity VA — 60 Cys.	Net Price
AR-1	15	\$12.00
AR-2	30	15.00
AR-3	60	21.00
AR-4	120	28.00
AR-5	250	46.00
AR-6	500	67.00
AR-7	1000	110.00
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Designs for 220 volt service available at 25% increase in price. for 50 cycle units increase price 25%; for 42 cycles, 35% increase; for 25 cycles, increase price 100%. Special secondary voltages available to customers' specifications at small increase in price.

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The unique design of these regulators makes possible the construction of special units with relative ease. The output can be arranged to provide filament and plate voltage, or any other special voltages that may be required. Write for details.

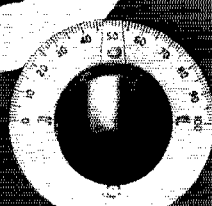
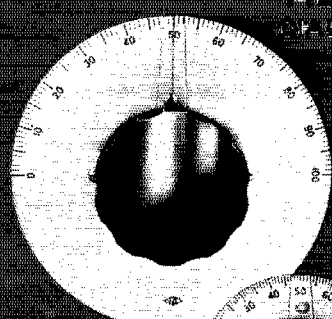
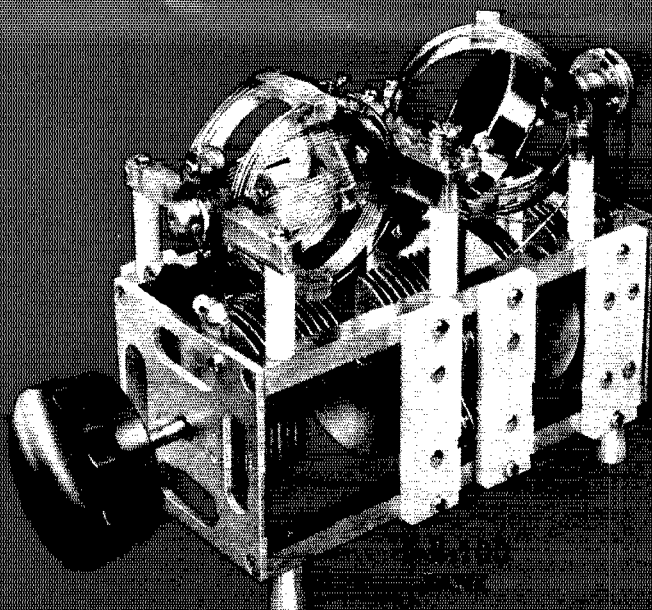


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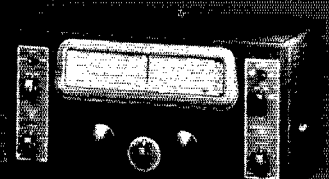
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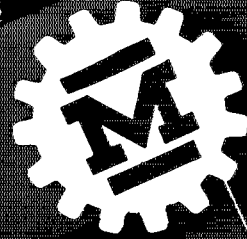
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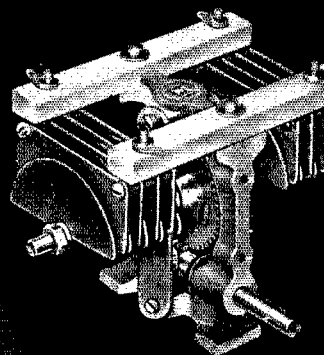


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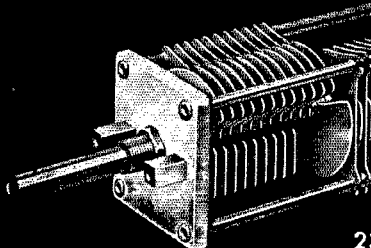
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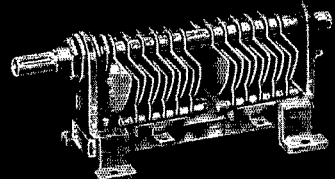
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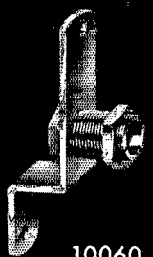


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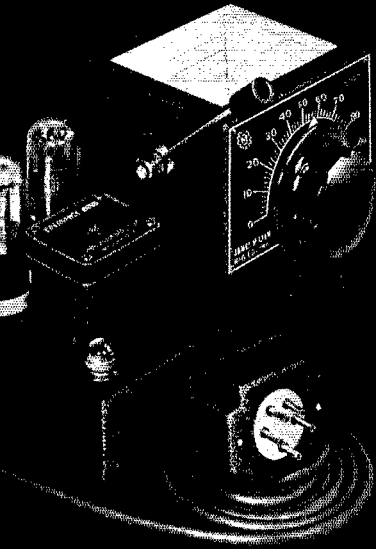
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