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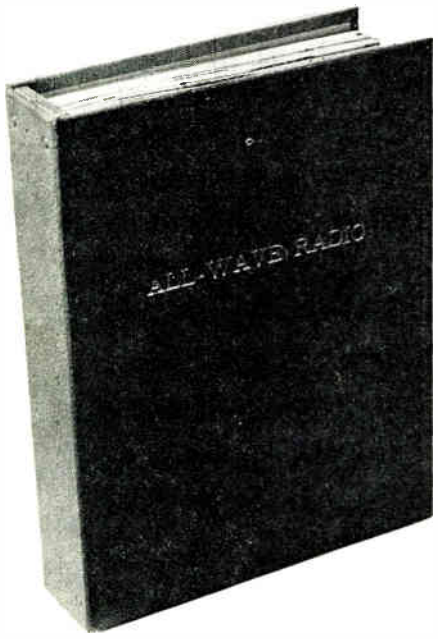

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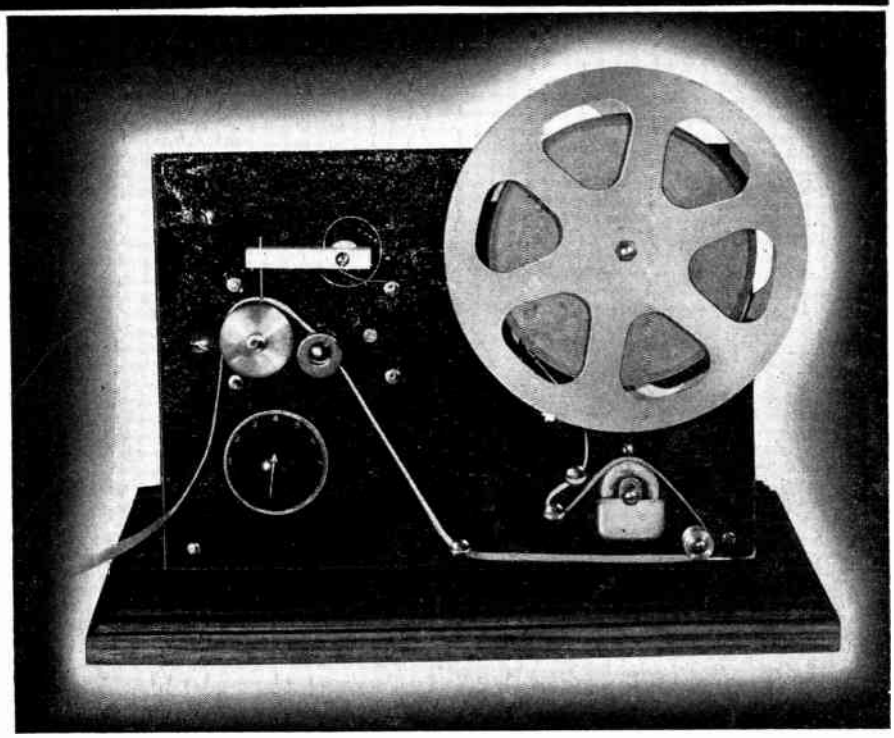

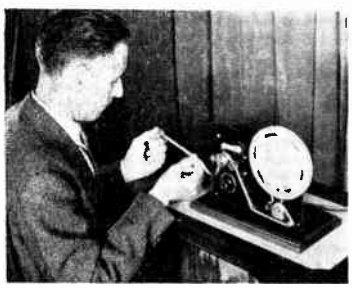

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AMERICAN COMMUNICATIONS CORP.
1650 Broadway • New York, N. Y.

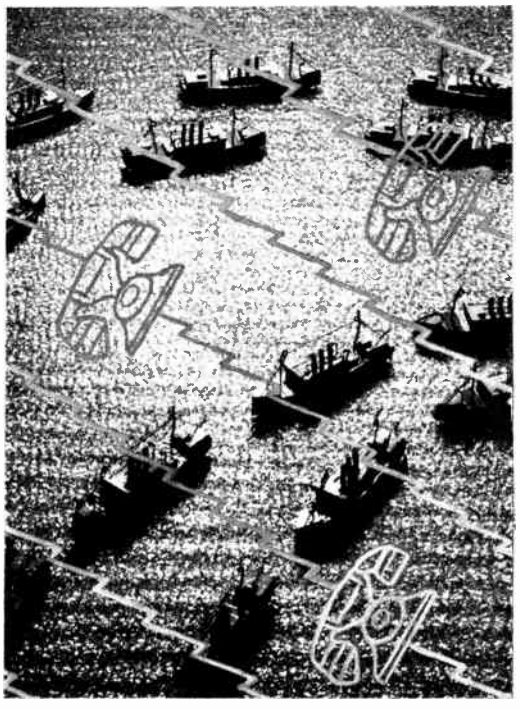
All-Wave Radio

EDITED BY M. L. MUHLEMAN

VOL. 3, NO. 10 OCTOBER, 1937

COVER ILLUSTRATION

TO SHIPS AT SEA- -THE WORDS OF THE TWO SPEAKERS FLASH BACK AND FORTH BETWEEN SHIP AND SHORE THROUGH THIS OVERSEAS SWITCHBOARD AT WALKER STREET, NEW YORK CITY. (W. E. - A. T. & T. PHOTO)



AN INTERESTING PHOTOGRAPH TYPIFYING AN INTERESTING PHASE OF MODERN LIFE—TELEPHONE CONNECTIONS BETWEEN SHORE AND SHIPS AT SEA. AMATEUR PHOTOGRAPHERS WILL BE INTERESTED TO KNOW THAT THE SHIPS ARE TOY MODELS LAID ON A PIECE OF OFFICE PARTITION GLASS. (W. E. - A. T. & T. PHOTO)

CONTENTS

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OFFICIAL ORGAN OF THE RADIO SIGNAL SURVEY LEAGUE

Editorial Quotes

BY THE EDITOR

BIRTHDAYS are exciting things for the youngster, but as he grows older his thrill at passing the milestones of life becomes less acute, until finally the birthday brings to him no emotions whatsoever.

The thrill we experienced in passing our first milestone with ALL-WAVE RADIO impelled us to advertise the news on the front cover of the October 1936 issue. But now that we have reached the second milestone, we find our emotions somewhat tempered.

Though ALL-WAVE RADIO is young as magazines go, it has, we feel, taken on the stature of a seasoned periodical. Certainly it is no longer necessary to herald its anniversaries in the "today I am a man" manner. Chest pounding seems to have become inappropriate.

But we cannot slide through the second anniversary without expressing our deep gratitude for the splendid support we have received from readers and advertisers alike. It is this support that has made it possible for us to lay new plans for the future.

◆

WE would suggest that you give consideration to your antenna system before winter sets in; you won't find it pleasant overhauling your present system or installing a new one once snow and sleet arrive.

A good overhauling should include the cleaning of insulators and corroded connections, the strengthening of supporting ropes so the whole works won't come down in a storm, and an inspection of all conducting leads to make sure that they do not touch or rub against other objects whether these objects are conducting or not.

If you have the time and the inclination, it will be worth your while to increase the height of the flat-top either by poles or other supporting structures. An additional ten feet or so will make a big difference, not only in relative signal strength but also in the signal-to-noise ratio. With each foot in height gained, signal level goes up and noise level goes down.

If you have the space, try using two directional antennas, such as doublets, one strung at right angles to the other. A double pole, double throw knife switch at the receiver will take care of the selection. In this way signals from any direction can be favored by the proper selection of antenna, and the resultant signal level in the receiver boosted a few R's.

If you specialize in a certain frequency band, a lot can be gained by using a tuned antenna, with the wire or wires, depending upon whether it is a Marconi or doublet, cut to proper length for the desired band. A tuned antenna will bring the weak stations right out of the mud. Two tuned antennas, with directional characteristics, and strung at right angles to each other, will improve conditions that much more.

Use vertical antennas only when you can get them well above the ground. They are more susceptible to noise pick-up than the horizontal type. In either case, use a balanced twisted pair or shielded transmission line if the location is noisy.

◆

THE belief still persists that a license is not required for the operation of low-powered transmitters—particularly the type known as "transceivers." This is not the case.

A license is required for the operation of any type of radio transmitter, with the exception of a few used in special commercial services. Power has no bearing on the matter. The operation of transceivers without a Federal license is illegal, and makes the user subject to severe penalties.

Transceivers are combination receivers and transmitters using power of only a few watts and working on ultra-high frequencies. Because the range of these devices is usually limited to a few miles many purchasers have been unaware that they cannot be legally operated until the owner has passed the standard amateur examination for proficiency in code and technical knowledge.

◆

IT will be well worth your while to give 10 meters a twirl if your receiver covers that band. It has very definitely come to life, and being more or less of a winter band it should be open from now until next spring.

When it is in good form, the 10-meter band has all the good points of 20 meters, plus a few of its own. It is used principally for phone work, is occupied by the same class of amateur heard on 20, and is extremely good for super DX. It has the edge on 20 in that station interference is seldom encountered. It suffers from auto ignition interference, but a noise silencer installed in the receiver will take care of that.

You can't afford to overlook 10 meters if you're anxious to chalk up some real DX records.

◆

A HAM is judged by the reliability of his station signal, the manner in which he operates his transmitter, and by his "ether etiquette." His standing among other Hams depends a great deal on how he plays the game.

The standing of a listener is also dependent upon how he plays the game, but in this respect judgment is not passed so much on an individual as on listeners as a group. And it is a case of the many being judged by the actions of a few.

A listener may suppose that he can conduct his hobby the way he pleases without affecting other listeners, but he is wrong if that is his supposition. In the long run any inclination on his part to cut corners will react on him as well as other listeners.

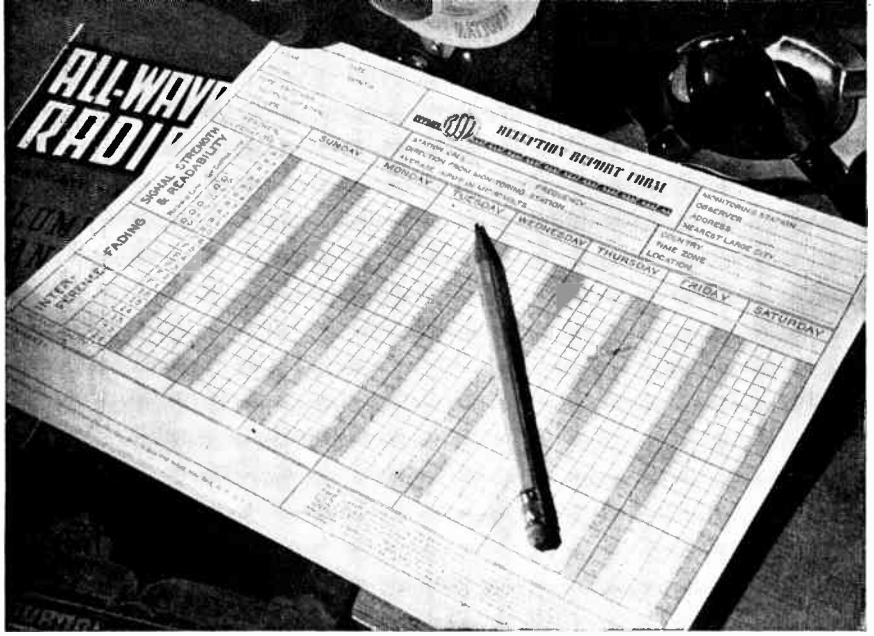
The Ham, for instance, is not in the business of distributing QSL cards. Every card he sends out costs him money. Consequently, if he is to send QSL cards to listeners at all, he has a right to expect something in return for the courtesy. Yet all he asks is a signal report that is of some use to him. Surely that isn't asking much of the listener who expects a verification.

Nevertheless, there are many listeners who either won't take the time to write out a sensible report, or consider that the mere mention of having heard the Ham's transmitter is sufficient.

If a report is to be of value it should at least include data on signal strength, relative fading, quality of signal, signal readability, extent and nature of station and/or noise interference, the time the transmission was heard, the call of the station being worked, and some scrap of conversation to indicate the validity of the report.

The last item is particularly important, as no Ham can conscientiously issue what amounts to a verification unless the report includes a part of his conversation. Otherwise it is too simple a matter for a listener with no objections to cutting corners, to base his report on what he hears from a nearby Ham station in communication with a distant point—a sta-

(Continued on page 545)



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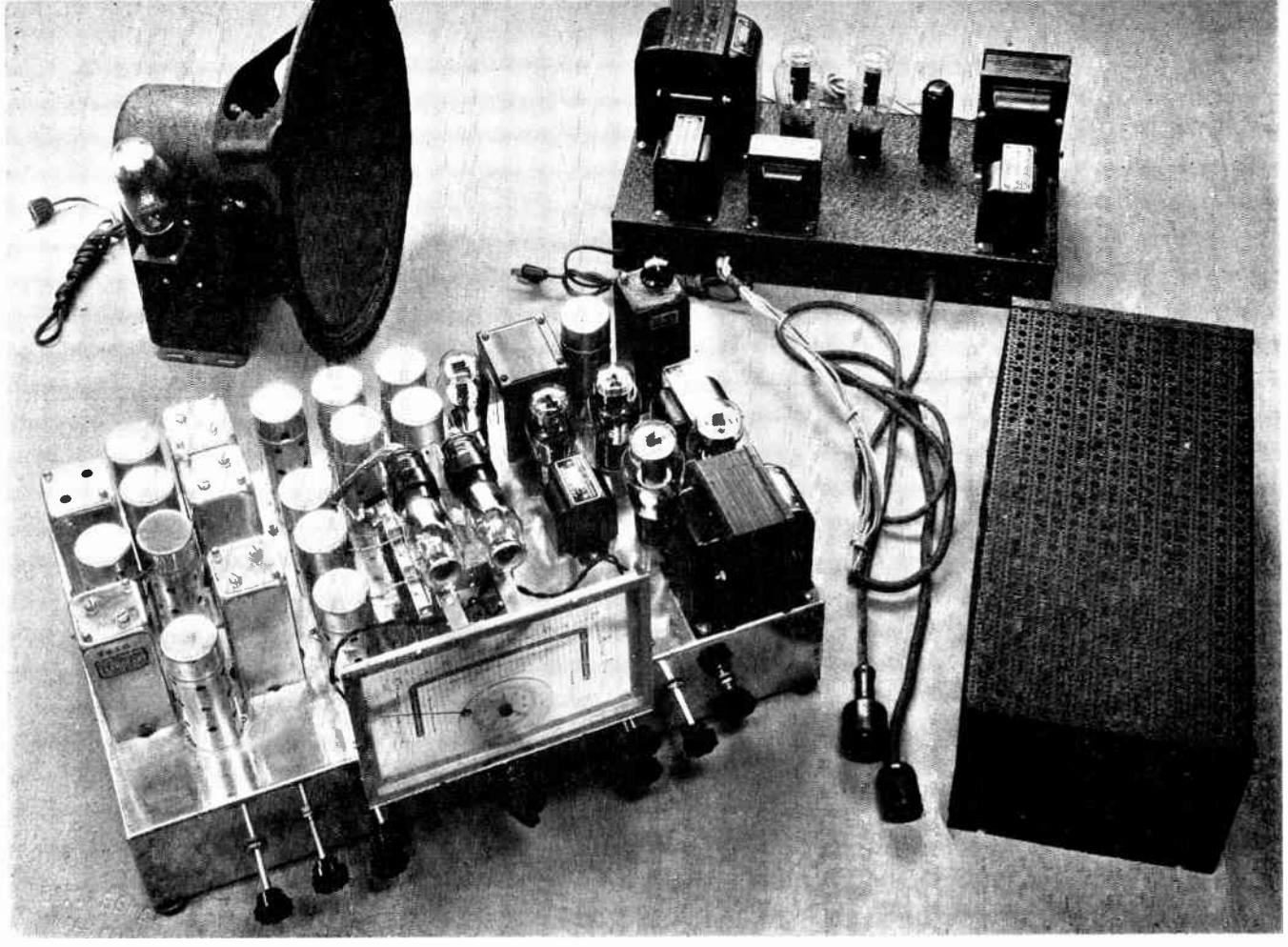


THE ORTHOTECH UNIVERSAL SUPER IN FULL ARRAY. THE BASIC UNIT IS DESCRIBED IN THIS ARTICLE.

THE ORTHOTECH UNIVERSAL SUPER

Design Features Permit Progressive Construction

PART I **BY RAYMOND P. ADAMS**

IN introducing this new receiver, we should like to point out that the illustrated advanced laboratory model—presented as a complete, perhaps somewhat complex job with every practical refinement and reserve power—is introduced more to demonstrate the *flexibility* of our *basic* design and to suggest a working plan than to become, of itself, a model for precise duplication.

In the course of this writing we will describe it carefully, so that readers who wish to do so may build receivers like it; we will go so far as to present complete layout and circuit information; but we nonetheless offer it to your attention as an individual job meeting certain individual requirements and indicating pretty clearly just what can be done with the fundamental circuit in general design as a groundwork structure supporting such refinement as usage and application may call for.

Fundamentally, this new design is a straight, simplified, all-wave superheterodyne, adaptable to either communications or general service—a 10-tube receiver of unusual short and long-wave efficiency. In basic form it meets ninety percent of custom construction requirements. It lends itself easily to minor circuit changes and constructional refinements or simplifications—such as suggested where the receiver is to be primarily used by the operating amateur; it is so presented, for that matter, that it may be built up as a fundamental structure and then refined and changed as circumstances demand or permit.

As illustrated at the head of this article, the receiver is a superheterodyne with Lamb noise suppression, separate a.v.c. circuit, volume range expansion, beat oscillator, phono-radio switching facilities, dual a.f. preamplifier channels for fader selection of crystal mike or phono-radio input, and 30 to 60 watt output—a multi-tube but practical piece of equipment which not only suggests the perfect all-wave custom super, but a thoroughly advanced and flexible public-address set-up particularly suitable for program distribution service.

The R. F. Tuning Unit

Universality of design begins with the r.f. tuning unit—selected both because of its high efficiency when properly installed and related to associated components, and because of its availability in various physically similar coil assembly arrangements.

It is first advisable for the individual builder to decide upon tuning require-

ments and the proper assembly for his receiver. If the instrument is to be used for largely communications purposes or perhaps general short-wave DXing, then he might find it advisable to secure one of two r.f. set-ups affording fairly wide band spread and maximum high-frequency sensitivity; either a five-band job covering a range from 550 kc. to 60 mc. (affording broadcast reception); or a four-band affair simply eliminating the broadcast-band coils. Both assemblies get down through the 5-meter spectrum—and both will require a three-gang variable condenser of low minimum and 260 mmfd. maximum capacity per section.

If, on the other hand, the receiver is to be employed in standard service and a wide band-spreading of amateur frequency spectrums is not imperative, then he might secure either a five-band assembly extending in range from 140 kc. down to 43 mc. and hitting both long wave and ultra-high frequencies; a four-band job eliminating simply the long-wave coils; or a three-band affair eliminating both long-wave and ultra-high frequency range extension. All three of these latter assemblies will require a three-gang low minimum variable gang condenser of 410 mmfd. maximum capacity per section and are so designed that most of the high-frequency broadcast stations—those operating in the 19, 25, 31, and 49-meter portions of the spectrum—may be tuned in with a single set of coils switched into service.

Fig. 2 illustrates the general construction of these various assembles, and Table I reviews and condenses what we have said here regarding particular set-ups and frequency ranges.

The assemblies are complete—with shield partitions, self-chassis, trimmers, padders, tuned circuit ground-return capacities, and oscillator plate bypass condenser installed—and are factory adjusted for 456-kc. i.f. operation. So far as general construction goes, all types are physically similar; and, as the matching 260- or 410-mmfd. gang condensers are themselves alike as to frame size, the layout data given in Fig. 3 holds for any of these assemblies and either of these capacities.

It might be wise at this point to study the Fig. 3 layout carefully; condenser, r.f. sockets, and r.f. assembly *must* be positioned in relation as shown, no matter how simple or complex your final job is going to be. This is most important to remember, as any departure from recommended layout may prevent accurate realignment and the realization of maximum r.f. efficiency.

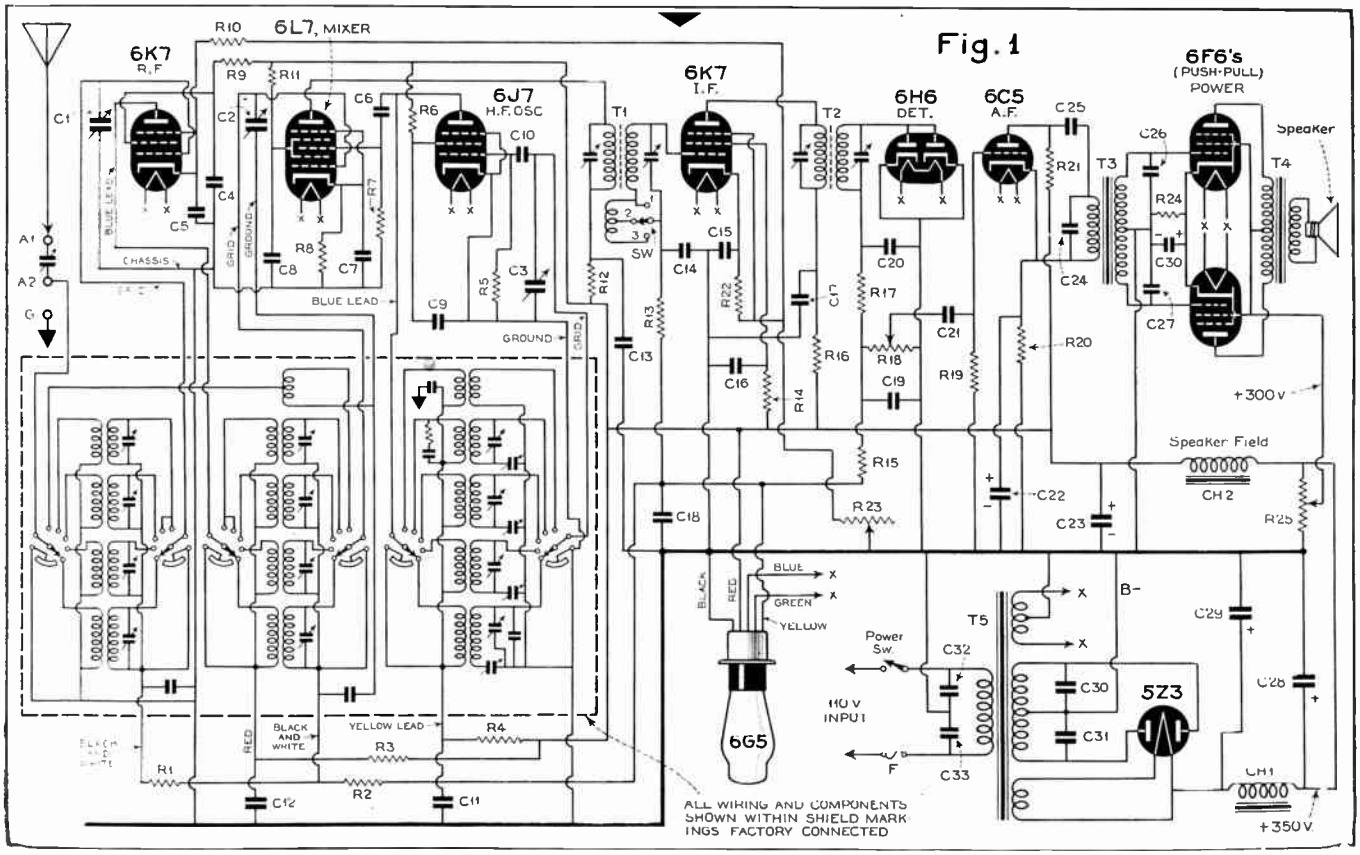
It should be noted that a dual-pointer, dual-ratio dial of the familiar Micromaster type will be definitely necessary, both for adequate band spreading and to permit accurate logging. A control with a clear wide face and a separate band-spread scale is suggesed, with the particular type illustrated with our advanced lab. model being perhaps the most suitable of all available units.

The Fundamental Circuit

The fundamental circuit and its component parts are the heart of our design—with the circuit itself a carefully worked out hookup from which no departures need be made. Fig. 1 illustrates this circuit.

In the r.f. section we use a 6K7 r.f. tube, a 6L7 mixer, and a 6J7 oscillator. All three tubes are series screen-fed through individual voltage-dropping resistors. The r.f. and oscillator plate circuits are decoupled and by-passed, the mixer cathode circuit returns to chassis, and the r.f. bias-limiting resistor is left free for manual r.f. fading control connection.

R7 is the usual 50,000-ohm return component for the 6L7 injector circuit, C6 the usual oscillator plate-to-mixer injector grid coupling capacity, and R5 the conventional 50,000-ohm bias resistor for the oscillator. C10 is the oscillator grid condenser *which should be of .00005 mfd. value when the coil assembly is designed for use with a 410 mmfd. variable condenser and .00025 mfd. when the assembly is designed for use with the 260 mmfd. condenser.* R1 and R2 are in the a.v.c. line and a.v.c. control is afforded both mixer and r.f. circuits except when the ultra-high frequency coils are switched into service.



Circuit diagram of basic receiver. The condensers C30-31-32-33 across power transformer are 0.1 mfd., 400 volts.

Note that when switched to the ultra-high frequency band—if such a band is in the chosen assembly—the r.f. stage is eliminated, the antenna being brought to direct connection with the u.h.f. mixer tuned inductance. This arrangement simplifies the design and alignment; and though the relative sensitivity as compared to that with other bands switched into operation might seem low, it is nevertheless entirely adequate, and certainly consistent with general-service 10-meter and amateur 5-meter receiving requirements.

The 5- or 10-meter (as the case may be) oscillator circuit is not padded, as coils are wound to very close limits. The immediately lower frequency band circuit—11.38 to 32 mc. or 5.9 to 18 mc., according to the type of assembly—is fixed-padded. Variable oscillator padding on all other bands is afforded for low frequency limit alignment accuracy.

A study of Fig. 1 will give all the necessary wiring information, and our list of parts for the r.f. section will afford specific values for resistor and condenser components. Fig. 3, to which we have previously referred, and the chassis drawing, Fig. 4, should adequately explain matters of layout and parts placement.

The I.F. and Audio Section

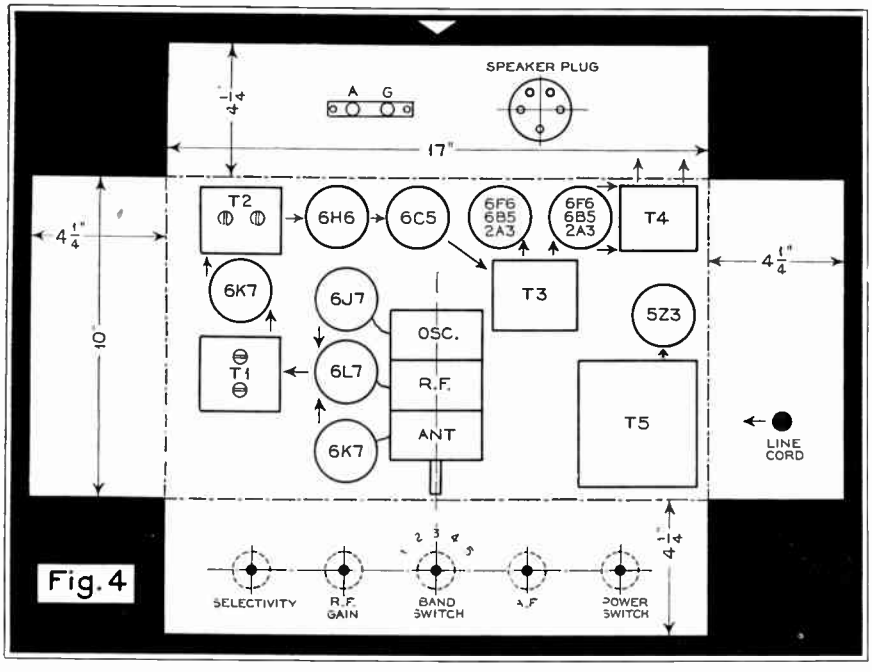
The basic or fundamental i.f.-a.f. circuit for the overall 10-tube design affords a high measure of general operating efficiency. Features of a completed set employing this particular set-up include: band expansion (variable selectivity) for high-fidelity broadcast or DX reception; adequate i.f. gain for all purposes; separate second detector and first audio tubes; a.v.c.; push-pull 6-watt distortionless 6F6 output; excellent signal-to-noise and signal-to-image characteristics; and, last but not least, a layout permitting refinement from time to time and without much of any trouble.

A single stage of 456-kc. i.f. is used, with ironcore (Ferrocart) transformers in both input and output positions. The transformer T1 is a band-expansion affair and permits a three-point adjustment of coupling for broad, medium, or sharp tuning, and thus a manual control of the selectivity characteristic. Both transformers (T1 and T2) are Alignaire tuned, which implies 3600 degrees of individual air-trimmer rotation and the means for a very accurate and stable adjustment.

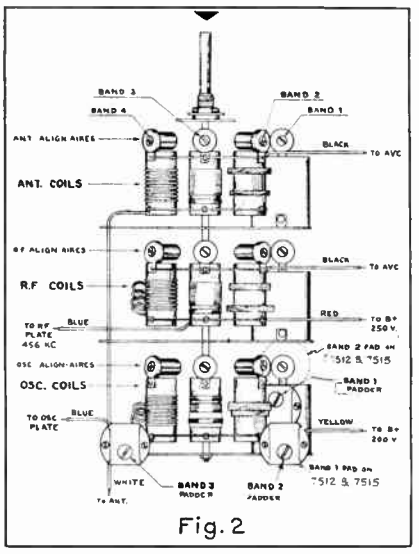
The 6K7 is a.v.c. controlled, individually bias limited, screen fed through a decoupling and voltage-dropping resistor, and properly decoupled in the plate circuit. Plenty of bypassing assures circuit stability. R23 permits a manual adjustment of gain and is the potentiometer to which the bias limiter in the 6K7 r.f. stage is tied.

The volume control in the diode load circuit (the detector is a 6H6, with sections paralleled) selects a.f. input to the 6C5 first audio driver for the transformer-fed 6F6s in the output stage.

The power unit, T5, supplies 6.3 volts for all tubes in the complete line-up, 5 volts for a 5Z3 rectifier, and high voltage for all plates. CH1 is the one necessary input filter choke of 150 ma. capacity rating, and note that though the sum total plate current as drawn by the receiver flows through this unit, only that portion of it drawn by tubes preceding those in the output stage passes through the 2500-ohm speaker field, CH2.



Chassis dimensions and layout for basic receiver. See text regarding progressive chassis.



The r.f. coil assembly. See Table I near end of article for alignment data.

With approximately 40 ma. being drawn by these tubes collectively, and with a 2500-ohm speaker field, a drop of 100 volts appears across the latter, sufficient to energize a really husky wide-range reproducer such as the one pictured with the advanced model. As 250 volts is required for proper operation of these tubes, 350 volts must be applied to the field; and with the 6F6s drawing about 80 ma. and a total of 120 ma. flowing through the 190-ohm input choke, CH1, the measured d.c. delivered by the rectifier must be in the neighborhood of 370 volts.

The transformer actually delivers 360 volts, and though output under full load might seem insufficient "on paper," to meet our requirements, laboratory tests have shown that proper voltages are indicated at all points with the receiver in operation and the T5 component in use. This transformer, by the way, is in itself a universal job, is not expensive, and supplies the following filament voltages: 2.5 v. at 1.75 amps. ct; 2.5 v. at 12.2 amps. ct; 6.3 v. at 4 amps, ct; and the 5 volts at 3 amps. necessary for the 5Z3 or a substituted 83 where increased high voltage output is called for. If we substitute 2A3s in the output stage for the suggested 6F6 pentodes, (with higher output and perhaps better quality), the 2.5-v. 12.2-a. winding may be used for their filament supply, leaving us 4 amps. at 6.3 volts for as many as thirteen .3 amp. tubes. If we use 6F6s, which draw .7 amp. filament current each, we'll have enough 6.3-v. power left over for as many as 8 other tubes, permitting us to add another tube to the line-up (such as a b.f.o. or second i.f. tube); and if we substitute a 2.5-volt tuning indicator tube for the 6G5 and power this from the extra 2.5-volt winding, then we may add still another 6.3-volt, .3-amp. tube without exceeding transformer capacity. 6B5s in the output stage would require

6.3 volts at 1.6 amps.—reducing available filament power for other 6.3 volt tubes to 2.4 a.—still enough for 8 filaments.

Though we have shown 6F6 pentodes in the output stage, a number of other arrangements will be permissible. In some instances input and output transformers need not be changed. In others, substitute components will be required, as indicated in the parts list.

The 6F6s may be connected either as triodes or as pentodes and driven Class AB. Or 6B5s may be used—or equivalent octals. The old familiar 45s might work out well, or the 2A3s. So long as our driver tube produces enough power to swing grids properly, and audio components are in proper functional relationship in driver and output stages, and so long as our power unit capacity is not exceeded, we can use any one of these and some other arrangements. 6B5s, perhaps, would require no biasing. Bias for other tubes is given in any tube table, and, with the plate current of the two tubes in push-pull known or estimated, it would be a simple matter to find the proper value in resistance for R24 through the application of Ohm's Law.

If push-pull output is not required and a single 6F6 pentode will afford sufficient audio level for good speaker operation, a smaller power unit is suggested—one supplying 350 volts d.c. at 85 ma.

PARTS LIST FOR BASIC RECEIVER

List Parts—Tuner Unit Only

AEROVOX
5—type 284 .1 mfd. (C4, C5, C7, C8, C9)
2—type 484 .1 mfd. (C11, C12)
1—type 1468 .00005 mfd. mica (C6)
1—type 1468 .0001 mfd. mica (C10)

AMPHENOL
3—RSS-8 steatite octal sockets

CONTINENTAL
3—type M-5 100,000 ohms, ½ watt (R1, R2, R9)
2—type M-5 50,000 ohms, ½ watt (R5, R7)
1—type M-5 40,000 ohms, ½ watt (R6)
1—type M-5 15,000 ohms, ½ watt (R11)
1—type M-5 10,000 ohms, ½ watt (R4)
1—type M-5 1,000 ohms, ½ watt (R3)
1—type M-5 600 ohms, ½ watt (R8)
1—type M-5 300 ohms, ½ watt (R10)

CROWE NAMEPLATE
1—type 481 Micromaster dial
1—type 588 pointer knob

EBY
1—two (or three) post antenna-ground assembly

MEISSNER
1—coil assembly (see Fig. 2 and text)
1—three gang variable condenser (See text) (C1, C2, C3)

NATIONAL UNION
1—6K7
1—6L7
1—6J7

Parts for Basic I.F.-A.F. Assembly

AEROVOX
2—type 484 .1 mfd. (C13, C17)
2—type 284 .1 mfd. (C15, C16)
3—type 284 .05 mfd. (C14, C18, C21)
1—type 484 .25 mfd. (C25)
1—type 284 .01 mfd. (C24)
2—type 1468 .0001 mfd. mica (C19, C20)
2—type 1468 .0025 mfd. mica (C26, C27)
3—8 mfds. 450-v type PB5 (C23, C28, C29)
1—type PB25 10 mfd. 25-v. (C30)
1—PB25 25mfd. 25-v. (C22)

AMPHENOL
5—type S-8 octal sockets
1—type S-4 octal socket
1—type S-5 octal socket
1—type PM-5 plug
1—type MEA-6 magic eye assembly

CONTINENTAL
1—200 ohm, 3 watt (for p.p. 6F6 Class A) (R24)
1—type M-5 .5 meg, ½ watt (R19)
1—type M-5 .25 meg, ½ watt (R15)
2—type M-5 .1 meg, ½ watt (R13, R14)
2—type M-5 .05 meg, ½ watt (R17, R21)
1—type M-5 3000 ohms, ½ watt (R20)
2—type M-5 1000 ohms, ½ watt (R12, R16)
1—type M-5 300 ohms, ½ watt (R22)

CROWE NAMEPLATE
4—type 284 knobs

ELECTRAD (or Yaxley equivalent)
1—type 573, 12,000-ohm potentiometer (R23)
1—type 203, 500,000-ohm audio potentiometer (R18) (with or without SW-AC switch, as desired)
1—type C-250 Truvolt resistor with slider (R25)

JEFFERSON ELECTRIC
1—463-361 power trans., 125 ma., 360 volts d.c., for p.p. 6F6 service (TR5)
1—universal output trans., type 467-171 for single or p.p. output tubes up to 6 watts output (TR4)
1—driver trans. type 467-454 for all p.p. inputs except 6F6 Class A Prime which requires type 467-461 (TR3)
1—type 466-430 10 henry, 290-ohm choke (CH1)

MEISSNER
1—type 7416 variable selectivity 456-kc. i.f.t. (TR1)
1—type 6645 output i.f.t. (TR2)
1—type 18254, 2 pole, multi-way switch (SW)

NATIONAL UNION
1—6K7
1—6H6
1—6C5
2—6F6
1—6G5
1—5Z3 or 5Z4

OXFORD-TARTAK
1—14-D 14" wide-range speaker, less trans., with 2500-ohm (CH2) field.

Miscellaneous
1—chassis 17" long x 12" deep x 4¼" high, drilled as required, or preferably one 22" long x 12" deep x 4¼" high, drilled to Orthotech Universal specifications.
1—fuse block
1—2-amp. fuse

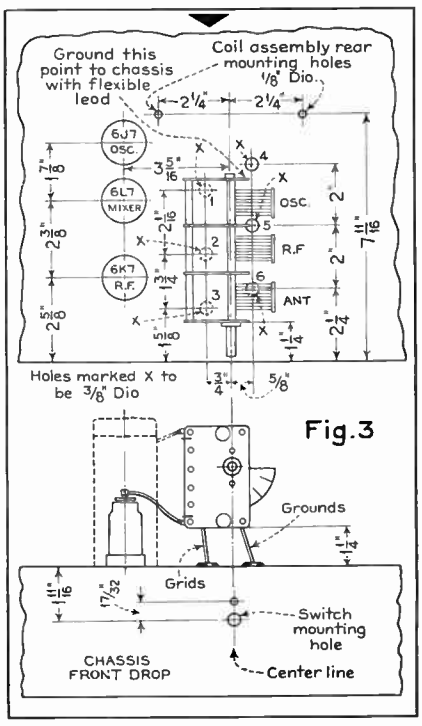


Fig.3

Chassis mounting details for r.f. assembly units.

and fairly universal in filament voltage capacity.

Antenna Sensitivity

The fundamental set-up with single i.f. stage, diode detector, high-gain first audio substituted for 6C5, single pentode output, and five-band r.f. assembly using 410-mmfd. variable condenser, has the following characteristics:

For 50 milliwatts output—longwave, 5 microvolts or better; broadcast, 5 microvolts or better; middle and high frequency, 1 microvolt or better; ultra-high frequency, 100 microvolts or better.

Constructing the Receiver

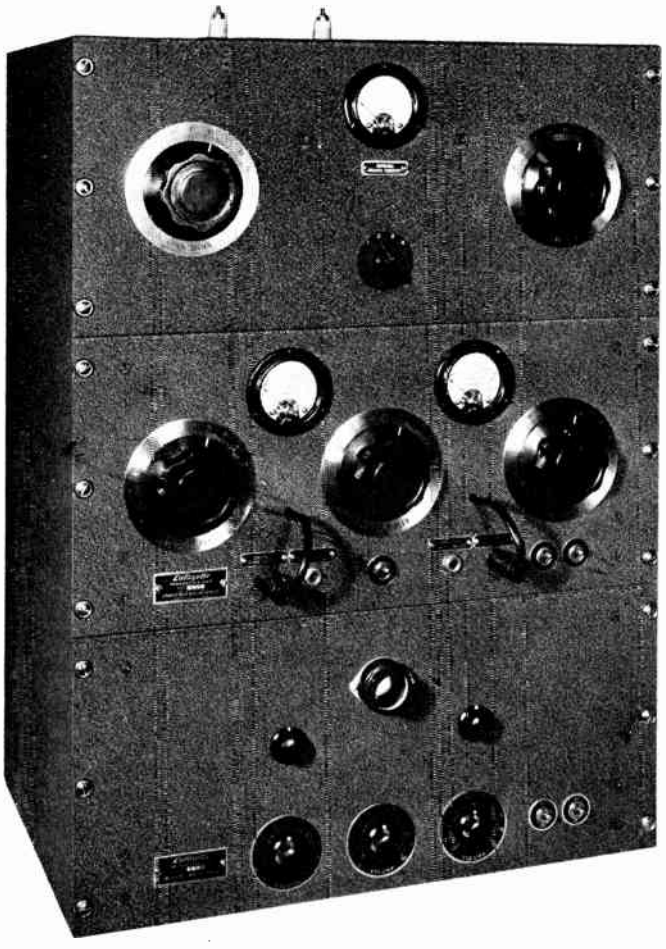
The simplified receiver may be built upon a 10 by 17 by 4¼ inch chassis, with the coil assembly installed and the chassis drilled to the specifications given in Figs. 3 and 4. In such a case other components may be added later on, as will be covered in the next article. We do not, however, recommend such a move where the builder intends to enlarge upon and refine his basic construction at some future date; here we advise the use of a larger chassis—also to be dealt with next month—which presents drilling and cutout information in detail and which permits several parts arrangements and the building of a job in basic, advanced lab. model, or any other recommended form.

And here's some good constructional advice and a few explanatory pointers:

1. Do not alter the length of braided cable leads from the r.f. coil assembly.

2. If glass-octal tubes, such as those used in the lab. model, are employed,

(Continued on page 547)



THE 5B40W TRANSMITTER

5 Bands--40 Watts

By Frank Lester • W2AM-J

Chief Engineer, Wholesale Radio Service Co., Inc.

THE 5B40W transmitter—meaning "5 Bands, 40 Watts"—is of ultra-modern design, which enables it to operate on any of the amateur bands from 10 to 160 meters. Moreover, by doubling in the final amplifier, the transmitter is actually capable of 5-meter performance.

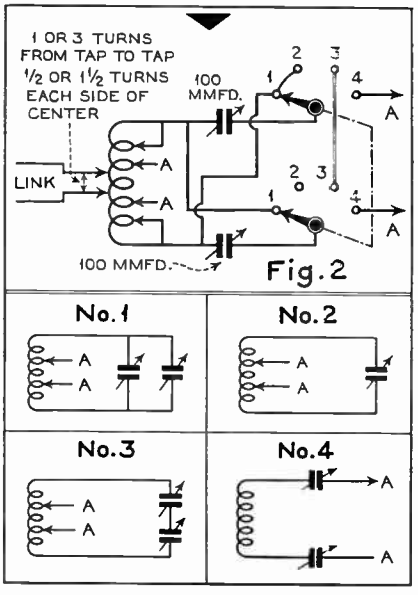
Uses Les-tet Exciter

Upon referring to the schematic diagram of Fig. 1, it will be found that the well-known and now more popular than ever Les-tet exciter is employed. This comprises the 6C5 crystal oscillator which is directly coupled to a 6L6 frequency multiplier or straight amplifier. Due to the proper selection of parts and layout, it is possible to operate straight through on the fundamental crystal frequency without resorting to neutralization of any kind. This is mainly due to the good screening of the 6L6 tube, as well as careful circuit design with one or two little tricks. In view of this, it is therefore possible to employ a 40-meter crystal, and actually operate the transmitter on 40 meters for c.w., 20 meters, 10 meters and 5 meters. In other words, the one crystal will act as the frequency control unit for 4 bands if the occasion demands this. Forty watts output will be obtained from the Raytheon type RK-37 hi-mu triode which is employed as the final amplifier on all bands with the exception of 5 meters. The power output at 5 meters, due to the fact that frequency doubling is resorted to in the final stage, is approximately 25 watts.

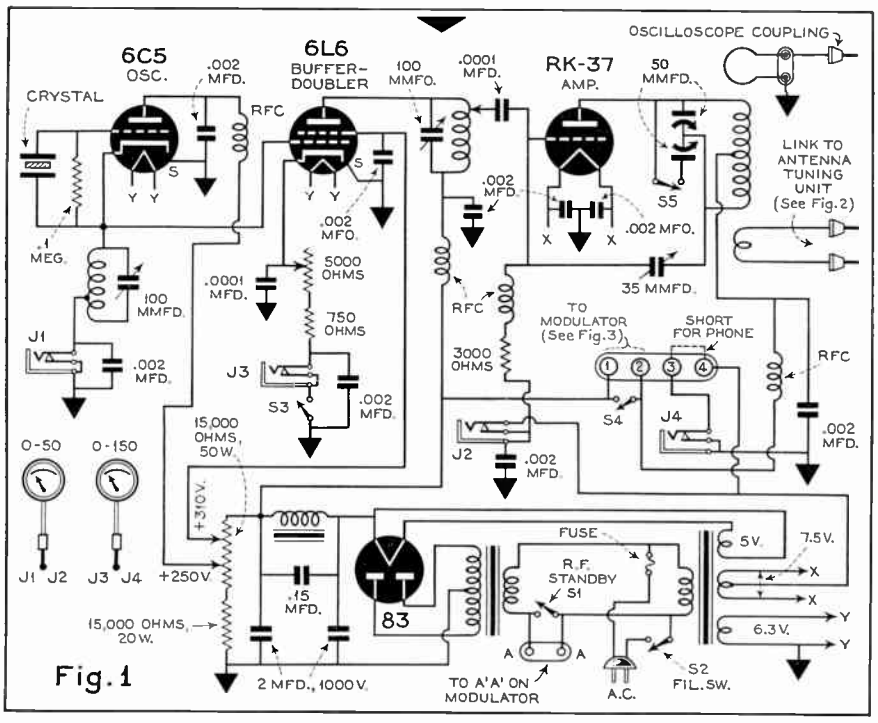
Since the 5B40W is a complete 3-unit transmitter comprising the antenna panel, the r.f. unit and the modulator, the information given in the previous paragraph applies only to the r.f. unit, which is usually the first item of interest in the operator's mind. The entire unit has exceptionally good appearance, for the 3-unit cabinet it is housed in, as well as the panels, are done in the new gray wrinkled finish. Unlike the former black crackle or wrinkled finish, the gray finish will not show finger-prints or absorb dust. Therefore, in addition to improving the appearance, the new finish also has other advantages. The new contrast presented by the nickeled silver dials and black knobs on the gray finished panels really must be seen to be appreciated.

Antenna Panel

In designing the antenna panel, every effort was made to make this unit match about every antenna tuning combination it is possible to obtain. This panel comprises two Hammarlund 100-mmfd. double-spaced tuning condensers, and a tapped air-wound and spaced inductance unit. By means of the special Isolantite type rotary switch, it is possible to obtain four different circuits, as shown in Fig. 2. Position 1 of the switch connects the two variable condensers in parallel across the inductance for tuning at the lower frequencies. Position 2 connects only one of the 100-mmfd. condensers across the inductance. Position 3



The neat switching arrangement in the antenna circuit to provide proper matching on all bands.



Circuit of the r.f. unit and its power supply.

connects both the 100-mmfd. variable condensers in series across the inductance, while Position 4 connects both the condensers in series with the feeders. A Triplett thermo-coupled r.f. ammeter is also incorporated to aid in tuning and output indication. The antenna unit is link coupled to the r.f. unit.

R.F. Unit

As the first paragraph and schematic diagram describes the r.f. unit rather thoroughly insofar as the circuit, tubes employed and output are concerned, we will not repeat this information.

Two Triplett milliammeters are employed with four jacks, making it possible to tune and operate the transmitter with a minimum of difficulty and expense. All of the jacks are at ground potential, completely eliminating possible contact with high voltage. A 0-to-50 milliammeter is employed to measure the oscillator plate current, and amplifier grid current, while a 0-to-150 milliammeter is employed for measuring buffer plate current and final amplifier plate current. All tuning controls and jacks are clearly marked.

As the final amplifier is the only one requiring neutralization, this control is brought out at the rear and is equipped with a calibrated dial and knob. Terminals for keying the final amplifier in the filament center tap and for insertion of the modulation transformer secondary are also brought out at the rear of the chassis. A fuse is employed in series with the primaries of the two transformers employed, one of which incorporates all filament windings, and the other high voltage. The filament and plate switches are located on the front panel along with a third switch which opens the cathode circuit of the 6L6 buffer multiplier.

If you will refer to the schematic diagram of Fig. 1, it will be noticed that a split-stator condenser is employed to tune the final amplifier plate circuit. This however, is not connected in usual split-stator fashion. In order to cover all amateur bands from 160 to 5 meters efficiently, it is necessary that the proper LC ratio be maintained in the tank circuit. This is very effectively accomplished by the use of a split-stator condenser which is really used as a straight condenser, enabling 50 mmfd. to be employed for tuning the high-frequency band from 14 megacycles up, and 100 mmfd. for tuning from 7 megacycles down. Switch S5 is mounted right on the variable condenser frame, keeping all leads exceptionally short. As a matter of fact, the entire r.f. unit has been so designed that all leads are less than 3 inches long in the grid and plate circuits.

Coils

All of the coils, with the exception of the 10-meter buffer coil, and 5- and 10-meter final amplifier plate coil, are wound on bakelite forms of the standard 5-prong type. All of the amplifier plate coils, with the exception of the aforementioned, are wound on large bakelite 5-prong forms, the higher frequency coils being space-wound on the threaded form.

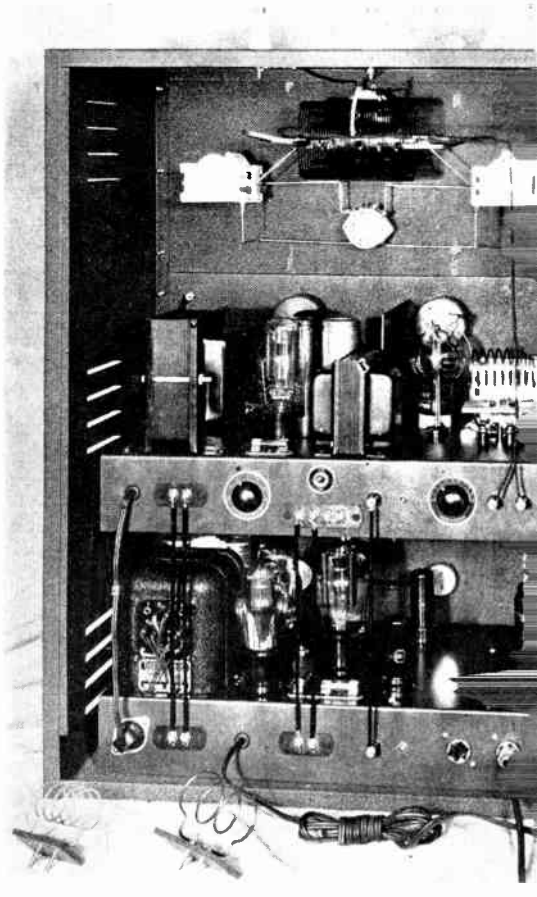
The 10-meter buffer plate coil, and the 5- and 10-meter final amplifier plate coil are of the air-wound and air-spaced type, mounted on a small piece of mycalex, in order to keep losses at a minimum.

An excitation control is provided in the buffer stage of the r.f. unit, which adequately takes care of the variable excitation requirements that must be contended with.

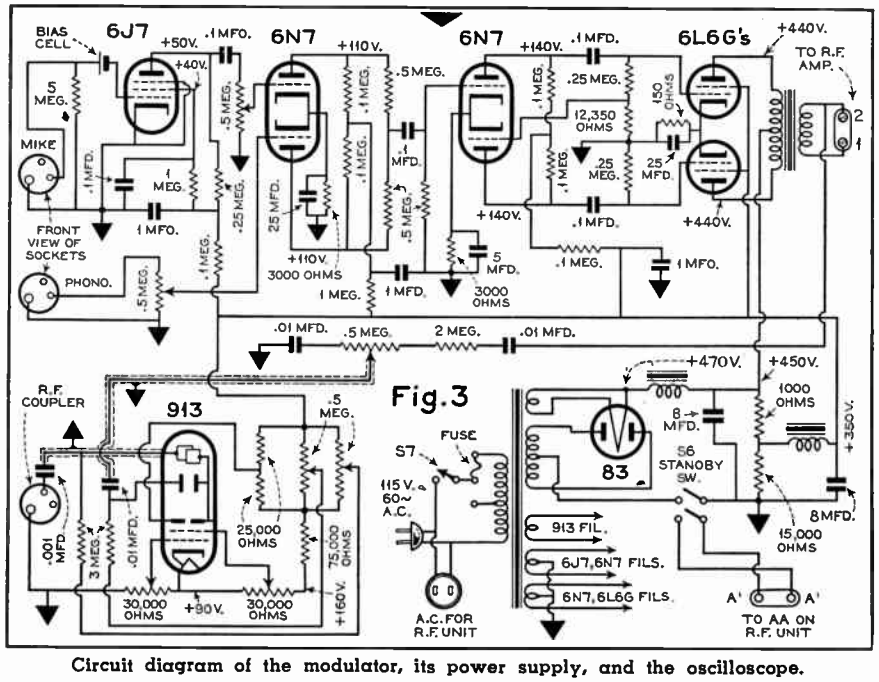
Modulator Units

The combined speech amplifier-modulator, the circuit of which is shown in Fig. 3, employs the following tube line-up; a 6J7 high-gain, high-impedance input; a 6N7 low-gain, high-impedance input and mixer stage; a 6N7 phase-inverter; and a pair of 6L6G tubes in push-pull. A 913 cathode-ray tube may be employed for modulation monitoring purposes, for the modulator is also equipped to supply the various plate and filament voltages for this tube. Five controls are also provided for the 913 tube. The focus and intensity controls are brought out to the panel, and are therefore equipped with knobs. The vertical and horizontal centering controls are of the screw-driver adjustment type, as one set may very seldom require readjustment. These screw-driver adjustment controls are brought out on the chassis. The fifth control is for the audio-frequency sweep and enables a trapezoidal pattern to be obtained.

The undistorted output of the modulator is conservatively rated at 30 watts, which is more than enough to modulate the r.f. unit at 100%. A Thordarson multi-match modulation transformer is employed, which means that this modu-



Rear of transmitter, with door open. Bottom to top: Modulator, R.F. Unit, Antenna Panel. Oscilloscope is on lower chassis.



Circuit diagram of the modulator, its power supply, and the oscilloscope.

lator is capable of matching practically any r.f. load that will ever have to be contended with. It is also possible to obtain a 500-ohm output impedance, which means that the unit may also serve for p.a. use if the occasion demands.

Two switches are employed for plate and filament control. The plate control switch is of the double-pole, double-throw variety, and is so wired that when the three units are properly interconnected, the plate switch of the modulation unit controls both the modulator and the plate supply of the r.f. unit. This means that this switch is the only one that has to be thrown for transmit and standby periods.

The frequency response of the modulator is within 3 db. from 50 to 10,000 cycles. The high-level input circuit has a gain of 125 db., while the low-level channel has a gain of 85 db.

As previously explained, this transmitter is capable of operating on all of the amateur bands from 10 to 160 meters. On all of these bands the final amplifier is operating as a straight neutralized Class C amplifier. For 5-meter operation, the RK-37 operates as a frequency doubler, which is the reason that it is only possible to obtain approximately 25 watts output on this band, rather than the 40 watts output which is obtained on all of the other bands.

The writer does not like to advocate modulating a frequency doubler; however, for 5-meter operation this is perfectly O.K., for a far superior signal will be emitted from this transmitter on the 5-meter band than it is possible to obtain from any of the self-excited rigs which are still in the majority on 5 meters. All reports received when this transmitter was being tested were more than gratifying regardless of what band was being employed. Five-meter reports usually met with the query, "Say, O.M., what are you using anyway?" This is due to the exceptionally stable signal and lack of frequency modulation that is immediately noticed when a signal of this type is tuned in on the 5-meter band.

High Power

For the high-power man who may desire to operate a transmitter capable of 250 watts input or thereabouts, the r.f. unit only makes an exceptionally good exciter unit. As it is possible to merely open the modulation link and use the built-in power supply for only the oscillator and buffer-doubler stages and use an external supply delivering 1000 or 1250 volts to the RK-37 plate circuit, much higher output can be obtained from the RK-37. As the final amplifier in this case will require a separate power supply, there is no reason why this supply cannot also be employed for the RK-37 in the r.f. unit, which naturally would greatly increase the output of the RK-37. Only approximately 600 volts is applied to the RK-37 in the r.f. unit; however, this tube is capable of taking up to 1250 volts on the plate without showing any signs of discomfort whatsoever.

The modulator likewise may be employed to modulate any other r.f. amplifier or oscillator running at no more than 75 or 80 watts input. Due to the built-in Thordarson multi-match modulation transformer, any Class C or oscillator plate load may be matched.

As the various illustrations showing this transmitter will speak for themselves, we will close now, with 73.

INTERSTATE 5-METER NET

WITH the arrival of the active radio months, the Interstate 5-Meter Net, which has shown marked progress since its founding in November, 1935 by W2HUT, is again getting into swing. The Net will be active from October to March.

The various network groups, comprised of a minimum of four stations supervised by a Control Station, congregate on the air in the 5-meter band each Sunday morning at 10:30 and usually remain until 11:30. The various groups are connected into chains by means of relay stations able to maintain two-way contacts between the widely separated areas.

There are groups in New York City, Brooklyn, N. Y., Connecticut, Massachusetts, New Jersey, and Pennsylvania. One group-chain is formed by W2COT, W2DYO, W2HUT, W2IAG, W2IZP, W2JAM, W2JDO, W2JHN, W2JIK, W1HIR, and W1JBS. With W1JBS functioning as a relay station, connection is made with a second group-chain formed by W1AEY, W1AUK, W1CDR, W1DDP, W1FLQ, W1GYT, W1IKB, W1IJ and W1JRV in Connecticut and Massachusetts.

The New York area groups are formed by W2BCC, W2BOT, W2COT, W2EIG, W2HNT, W2HRV, W2HUT, W2HWY, W2IAG, W2INO, W2IXD, W2IZP, W2JBD, W2JBL, W2JDR, W2JGZ, W2JIK, W2JJX, W2JLY, W2JSF, W2JUO, W2JWX, W2JZD, W2KCT, W2KEA, and W2KJV, the control stations for these groups being W2HUT as the Chief Control Station and W2HWY, W2IAG, W2IMM, W2JDO, W2JIB, W2JIK and W2JUO.

The group in Philadelphia is formed by W3DDT, W3DRA, W3EPO, W3EUY, W3FGB, W3FJH, W3GCN, W3GEF, W3GKO, and W3GQS, the control station being W3FHU.

The purposes of the Interstate 5-Meter Net are to encourage good operating procedure, prevent offenses against F.C.C. regulations, conduct DX tests among members, handle "doorstep" messages, promote QSO's, promote activities in the 5-meter band, institute interstate chain networks, and organize for communication work in times of emergency.

Membership requirements call for operation inside the 5-meter band, a fixed

(Continued on page 545)

AT LAST —
DX Records Certified

LISTENERS CAN NOW ESTABLISH PROOF OF THEIR DX ABILITY BEYOND DOUBT

OFFICIAL CITATION ISSUED TO S. W. BROADCAST DXERS.

THERE are few fields in which the competitive spirit is at a higher pitch than in DX radio reception. Thousands of listeners spend their spare hours tapping the ether with the hopes of making rare station catches. Many such catches are made, and in most instances the listener is at least rewarded with a verification card which bears proof of reception. But beyond this, small opportunity of complete recognition is afforded the listener for his pains.

Championship prizes, loving cups and medals are, of course, always acceptable to anyone entering a competition, but such awards either do not carry a complete and specific recording of the abilities of the winner, or if they do, the awards fail to establish recognition for more than a single contest. Moreover, since the records chalked up by the listener-contestants are not cumulative, but merely cite the abilities of a limited group over a limited period of time, sustained DX superiority is not established. The result parallels the situation in the field of professional wrestling—there are numerous "World Champions" rather than one, and there are no means of establishing relative ability.

Official Judging Body

Realizing the urgent need for an official and impartial judging body to provide authentic recognition of a cumulative nature, so that the listener can continually increase his standing record of DX reception, ALL-WAVE RADIO in cooperation with the Radio Signal Survey League, has instituted a system of recording, and has had prepared a series of DX Reception Citation certificates, that will definitely certify each listener's standing in distance reception.

The official judging body is composed of members of the staff of ALL-WAVE RADIO and Directors of the Radio Signal Survey League. This body will pass on the authenticity of all proofs of reception submitted by listeners applying for recognition.

The Citation certificates, issued by ALL-WAVE RADIO and certified by the Radio Signal Survey League, will be furnished those whose reception records are found to be satisfactory. Once a listener has made application for a citation, an individual file is set up for him at R.S.S.L. headquarters. Subsequent applications, together with the calls of the stations received and verified, are added to the previous records in the listener's own personal file. The accumulated list of stations appear on each additional Citation certificate issued so that, in a sense, each new certificate supersedes the previous ones, although the number of certificates alone serve to indicate the listener's standing, each new one verifying the authenticity of the previous ones.

The Citation Certificates

Three separate and distinct DX Reception Citation certificates have been made available; one covering DX reception in the Standard Broadcast Band, a second for Short-Wave Broadcast Band reception, and a third for the Amateur Phone Bands. All three certificates measure 8½ by 11 inches and are printed on high-grade bond paper with engraved borders and background. Each of the three certificates is a different color and is suitable for framing. Specimen blanks are illustrated on this page.

Citations are granted only to those able to make a creditable showing. Thus, a listener applying for his first citation for, let us say, reception of stations in the short-wave broadcast bands, must

(Continued on page 551)

OFFICIAL CITATION ISSUED TO AMATEUR PHONE DXERS.

OFFICIAL CITATION ISSUED TO BROADCAST BAND DXERS.

INTERFERENCE ELIMINATION

By Engineering Dept., Aerovox Corp.

PERHAPS the greatest obstacle yet to be overcome in radio communication is interference. In the popular mind, interference or "static" is any kind of sound other than the desired program. Therefore it is best to begin by defining terms. Interference may be divided into four kinds:

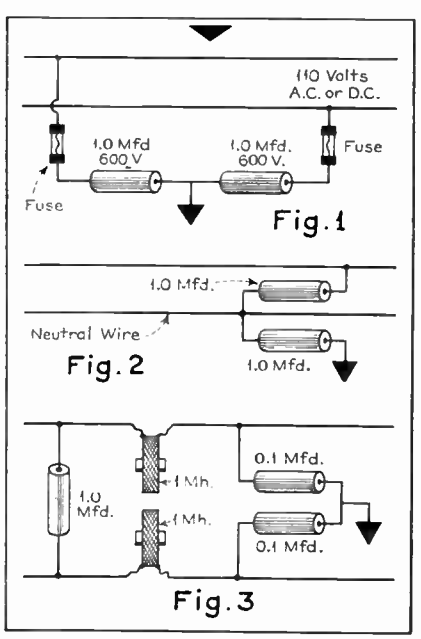
1. Natural static.
2. Interference originating in the receiver.
3. Interference from other stations or the neighbor's receiver.
4. Interference caused by electrical machinery in the vicinity.

Natural static cannot be completely eliminated at the present time. It is, however, but a small part of the interference which mars radio reception. The types 2 and 3 are clearly due to faulty receivers and should be remedied by competent servicemen. This article is concerned with interference of the last type.

What Causes Interference?

Whenever switches are closed, a spark jumps and a damped radio wave is radiated. This radio wave may eventually reach receivers in the neighborhood and because it is damped it will cause interference at different frequencies by impact excitation. The result is a multitude of noises in locations where many electrical devices are used, such as apartment houses and most locations in large cities. To mention but a few causes, radio interference is created by ordinary switches, vacuum cleaners, oil burners, electrical refrigerators, elevators, thermostat controlled devices. It is also caused by dial telephones, buzzers, passing streetcars, trains and automobiles.

One other cause not usually considered is any intermittent contact between two conductors both of which may appear quite dead since they are not connected to any electric wiring system. This is for instance the case if two aerial wires sway in the wind and touch each other. This causes interference in the receivers to which these aerials are connected, but also affects reception in all other receivers in the immediate neighborhood. The same effect is obtained by any other wires, not aerials, which may be swaying in the wind and touching another conductor such as guy wires connected to chimneys, etc. The remedy is obvious.



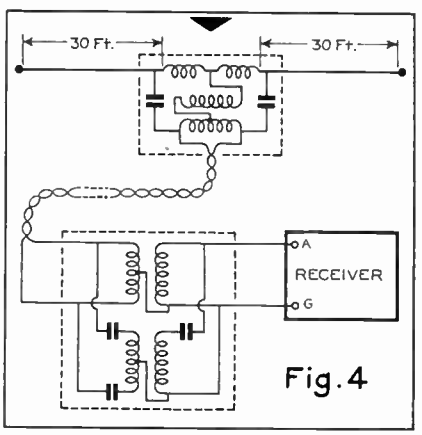
In the three figures above are shown simple methods of filtering the power line to the receiver by means of condensers, or condensers and r.f. chokes where necessary, as in Fig. 3.

How Interference Travels

The damped wave can travel to the receiver by any or all of four ways. First, it may be radiated directly by the wires; second, it can be conducted along the power wires and reach the receiver in that way. Third, it may be conducted along the power wires and radiated by them to the aerial. Fourth, it can be re-radiated by another conductor nearby.

The directly radiated interference reaches the receiver by way of the antenna and is therefore encountered on battery receivers as well as on line operated receivers. Obviously it cannot be eliminated except by suppression at the source or by means of a special antenna situated away from the interference zone and supplied by a noise-cancelling lead-in. This is often possible because directly radiated interference does not travel very far, perhaps no more than 50 feet.

The second type—conducted interference—appears on line-operated sets only, which suggests a way of testing for it. It can be reduced by means of a line filter at the outlet of the power line where the receiver is plugged in. Of course, suppression at the source is still better. This type of interference is usually accompanied by the third type which is by far the most common of the four. The interference travels by wire and is radiated by the wiring in the walls if it is not perfectly shielded, and by the power cord. This type may travel for several blocks and the radiation may take place by the wiring in the neighbor's house as well. One suggested remedy is to filter the power wiring at the point of entrance to the house but this may not be sufficient in apartment houses and other crowded locations where the unfiltered wiring of the neighbor is still near enough to cause trouble. The special aerial may have to be used as well if the noise cannot be stopped at the source.



General details of a noise-reducing antenna system for use when the noise is picked up through the receiver input.

The fourth type of interference comes in by the antenna and the same remedies as for the first type should be employed.

Hunting the Cause

When interference is encountered the first thing to do is to determine in which one of the four ways it is reaching the receiver. It will then be easier to decide on the best way of elimination. It is of course best if the search continues until the offending device is found. Many electrical appliances have their own characteristic noise which can be recognized by an experienced man.

Before blaming the interference on the surroundings it must be established that the receiver itself is not to blame. Bad connections may cause a frying noise and defective tubes may cause intermittent buzzing. These are often hard to locate; the old test of disconnecting aerial and

ground is not always reliable because some noises occur only when a signal is coming in. Tapping various parts of the receiver and the tubes will often help in finding the cause. Wherever possible another receiver should be tried in the same location.

Assuming that the receiver is blameless, disconnect aerial and ground and short-circuit the aerial and ground binding posts by a short wire. If the noise remains equally strong, it is the second, or conductor type. If the noise did disappear completely it came in by the antenna alone and belongs to the radiated or re-radiated type. If the noise became weaker it probably belongs to the third type—that radiated by the powerline—or it is a combination of several types.

A test for direct conducted interference is the use of a battery-operated receiver which will not pick up this type. Interference radiated by the power line can usually be identified by tuning through the dial and down to the short waves. If the trouble becomes worse on the short waves it is usually due to direct radiation and the source is probably within 50 feet. If the interference is worse on the long waves, the interference is probably carried along the power line and radiated by it. The source may then be several blocks away.

The above tests will give a clue to the probable location of the interference source: it can be further traced by the use of a portable battery-operated receiver and by a process of elimination, turning off the power in the house or in separate circuits. This will establish whether the line is at fault because the line radiated interference will disappear if a battery receiver is used and the power in the house is turned off.

Remedies at the Receiver

The best cure, of course, is the suppression of the noise at the source but the radio listener can do several things to eliminate or minimize the interference.

Noise created elsewhere and carried into the house by the power line may be suppressed at the point of entrance into the house. Of course this will not prevent interference from devices in the house itself. The type of filter employed for the purpose can consist of two condensers in series across the line with the center-tap grounded. It is recommended that fuses be employed in the circuit, as shown in Fig. 1, so as to prevent damage if one or both condensers might fail. It is also important that all the leads be short and that a good ground be used. The best ground in this case is the cold water pipe at the street side of the water meter. The size of the condensers may be 1 or 2 mfd. each, they must be non-inductive and have a liberal voltage rating.

If this is not sufficient, or the noise originates within the house, it is desirable to employ a filter at the outlet where the receiver is plugged in. The filter here can again consist of two condensers with the center-tap grounded. On a.c. the center tap will be "hot" unless it is effectively grounded. The alternative circuit of Fig. 2 has been suggested but there is little danger of shock if one is careful to connect the ground first when installing the filter. It may be necessary to try different grounds, such as the cold water

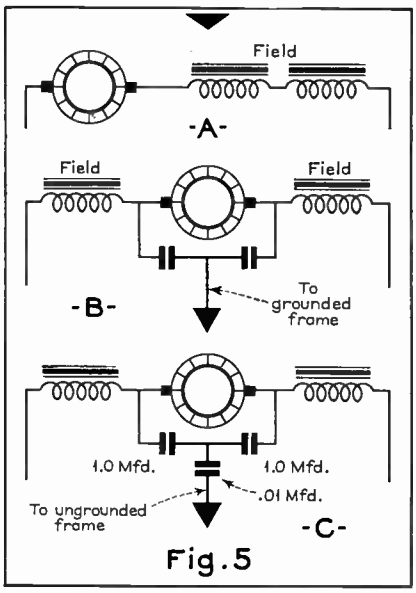
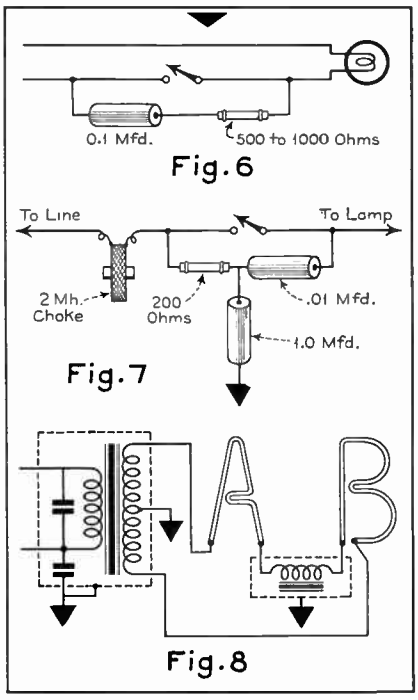


Fig. 5

Various methods of filtering a motor which develops noise interference.

pipe, the radiator or the conduit of wiring. In any case, the ground wire should be as short as possible and should not be the same as the one used for the receiver.

Where simple condenser filters are not sufficient it is necessary to employ a filter of the low-pass type consisting of coils and condensers, as shown in Fig. 3. More than one section can be employed with different size coils so as to bring maxi-



Figs. 6 and 7 show methods of eliminating noise interference from a switch or intermittent contact. Fig. 8 shows how to deal with a neon sign.

mum attenuation in the center of different wave bands. Inductance values up to 1 millihenry have been employed for the broadcast band, with condensers of .1 to .5 mfd. These values are not critical. It is necessary to shield the filter carefully. Mounting the coils in inductive relation to each other helps the efficiency of the filter.

The third measure an owner may take is to employ one of the special aerials employing a noise-reducing lead-in. A typical antenna of this type is shown in Fig. 4 . Note that it is the lead-in only which does not pick up noise, but the antenna itself will. Therefore the flat-top should be installed in a location where it is outside the interference zone. The lead-in may be as much as 500 feet in length. Experimentation with the direction and location of the flat-top will be worth while. Some commercial aerials of this type afford protection on the broadcast band but others do not, since the circuit is changed to a simple T antenna. The type shown in Fig. 4 allows reduction of noise on all bands. When using this type of antenna it may also be necessary to experiment with grounds. If a shielded lead-in is used the shield should also be grounded at the antenna end.

Suppression at the Source

In many cases the interference can be suppressed at the source in an inexpensive manner. Electric motors of the series type, both a.c. and d.c. may be rewired from the circuit of Fig. 5-A to the

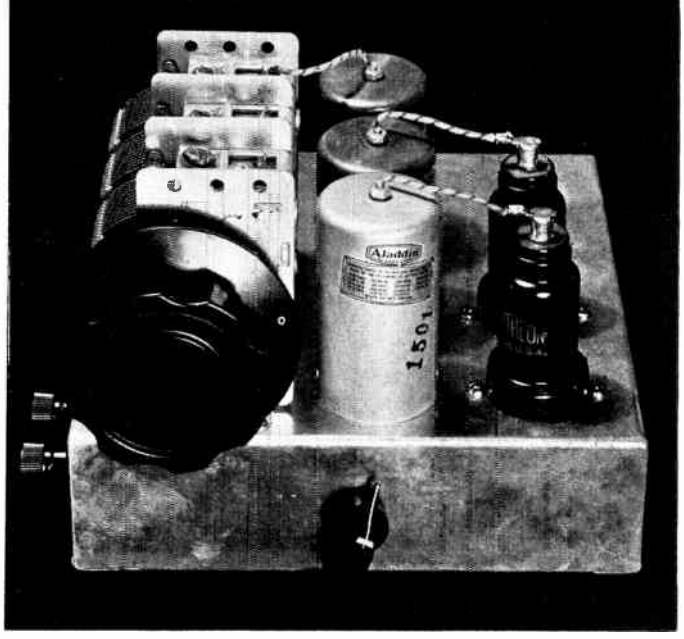
(Continued on page 549)

TABLE I

Size, B & S gauge	*Safe current (Amperes)*	*Power (Watts) on 110 v. line*	*Turns per inch*	
			Enamel	*D.C.C.*
10	6.9	690	9.5	8.9
12	4.4	440	12.1	11
14	2.7	270	15.2	13.6
16	1.7	170	19.1	16.7
18	1.1	110	23.9	20.2

WIDE-RANGE PHONO-RADIO UNIT

Part 2- The Tuner



By Chester Watzel and Williard Bohlen

In the first part of this article, dealing with the audio-frequency unit and loudspeaker, it was pointed out that if wide-range reproduction of radio programs is desired, it is necessary to limit reception to the better local stations. The explanation for this is that the degree of selectivity required for the satisfactory reception of distant stations limits the audio bandwidth of the receiver with a consequent elimination of the higher tones which add so much to the naturalness of musical programs. Moreover, if the receiver is designed to have sufficient sensitivity for distant reception, and variable selectivity is included so that the acceptance band can be opened up for wide-range reproduction, the situation is still unsatisfactory insofar as distant stations are concerned, as the widened selectivity, coupled with the high gain necessary for weak-signal reception, introduces an objectionable noise background that can be reduced to a reasonable level only by using a high degree of selectivity or attenuating the higher audio frequencies by means of a so-called "tone control."

A receiver with these features is, of course, highly satisfactory for wide-range reproduction of local programs—but such features serve no useful purpose if the receiver is designed only for quality reception from nearby stations. With the fullest possible enjoyment of local programs as the primary object, it is possible to greatly simplify the receiver end of a wide-range musical reproduction system. The only basic requirements are adequate sensitivity for local reception, and selectivity of a degree sufficient to exclude interference from other local stations.

The design of a "local station" tuner having such characteristics is fortunately rather a simple matter. Two stages of radio-frequency amplification and a detector stage do the trick nicely. Three tubes, three r.f. transformers, and a three-gang tuning condenser are the main components, and these units form the basis of the wide-range tuner to be described.

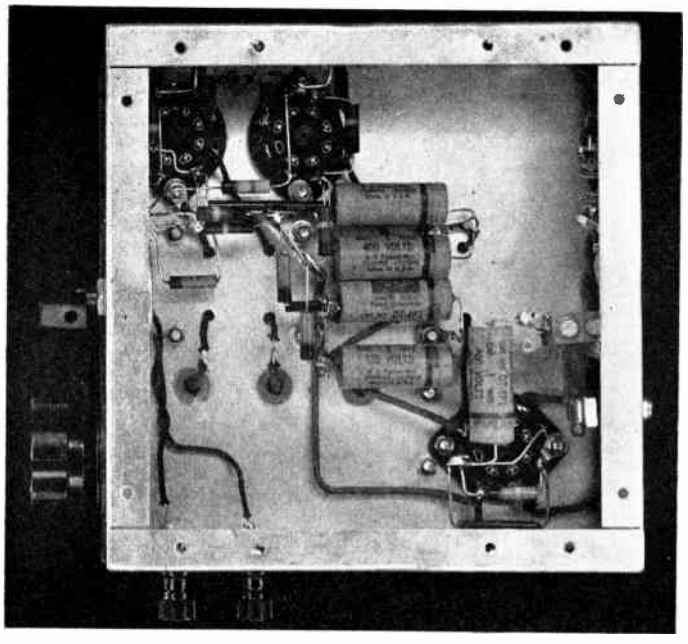
The R. F. Stages

The two r.f. stages follow ordinary practice in circuit and construction. Iron-core transformers are employed so as to provide adequate gain without resorting to an additional stage, and sufficient selectivity in but two stages to prevent inter-station interference.

The first r.f. stage is at the front of the chassis and is tuned by the front section of the gang condenser. The second stage and detector follow in sequence.

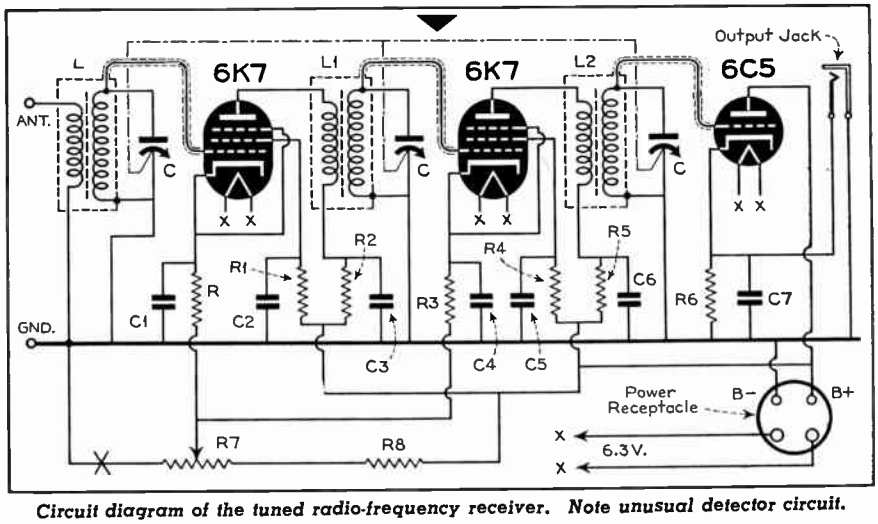
The antenna and first stage r.f. transformers have double secondary grid leads, one set being brought out the top of the transformer shields and the other set through the bottom. The top grid leads connect directly to the grid caps on the two 6K7 r.f. tubes, while the bottom leads are brought up through holes in the chassis to the lower stator connections on the first two sections of the gang condenser. One lead from each of the three wiping contacts on the gang condenser rotors are also brought below chassis for the "single point" grounding of each separate stage. This tends to reduce common coupling through the gang condenser shaft.

The cathode, screen and plate return circuits of each tube are separately filtered to further avoid common coupling troubles, and as an added precaution it is suggested that the grid leads from the r.f. transformers to the tubes be shielded with the "door spring" type of covering, and grid cap shields used on the two 6K7 tubes. This will permit maximum gain to be employed without the possibility of oscillation.



At top of page — the complete tuner. At left — below the chassis, showing wiring and location of parts.

The receiver gain control is placed in the common cathode return circuit of the r.f. stages. This provides smooth control of volume and eliminates any possibility of cross-talk between stations. The use of an additional resistor at point "X" is optional. This may be used to limit the gain of the r.f. stages should this prove desirable. The value of this limiting resistor may be anywhere from 500 to 3000 ohms. The greater its value the less will be the maximum gain in the r.f. stages.



Circuit diagram of the tuned radio-frequency receiver. Note unusual detector circuit.

Infinite-Impedance Detector

While the two r.f. stages will introduce no audio distortion if no regeneration is present, the detector stage can and will introduce distortion if the correct circuit and component values are not chosen. We have, therefore, given more thought to the detector circuit than would ordinarily be the case, as distortion developed at this point is emphasized in the audio-frequency amplifier.

It has been the general practice to utilize the linear detection capabilities of the diode detector in most modern receivers, as this type of rectifier introduces less distortion under proper conditions of operation than the earlier types of triode detectors. It must not be assumed, however, that the mere inclusion of a diode tube in a detector circuit is an insurance against distortion.

The chief cause of distortion in a diode detector circuit results from an a.c. load which is appreciably lower than the d.c. load. When this condition exists the ability of the diode to handle a high percentage of modulation is limited. This ability of a detector to handle various percentages of modulation without distortion is known as the "percentage modulation capability." If the station being received has a modulation percentage greater than the percentage modulation capability of the detector, amplitude distortion will result.

Another disadvantage of the diode detector is the fact that it presents a low-impedance load to the secondary of the r.f. or i.f. transformer to which it is connected. This tends to flatten appreciably the selectivity curve of the transformer. This would be no great disadvantage in a wide-range tuner since high selectivity is not desirable, but the low-impedance load also tends to reduce appreciably the gain or voltage build-up in the secondary of the detector transformer. This is a distinct disadvantage in a simple t.r.f. tuner where gain or sensitivity is at a premium.

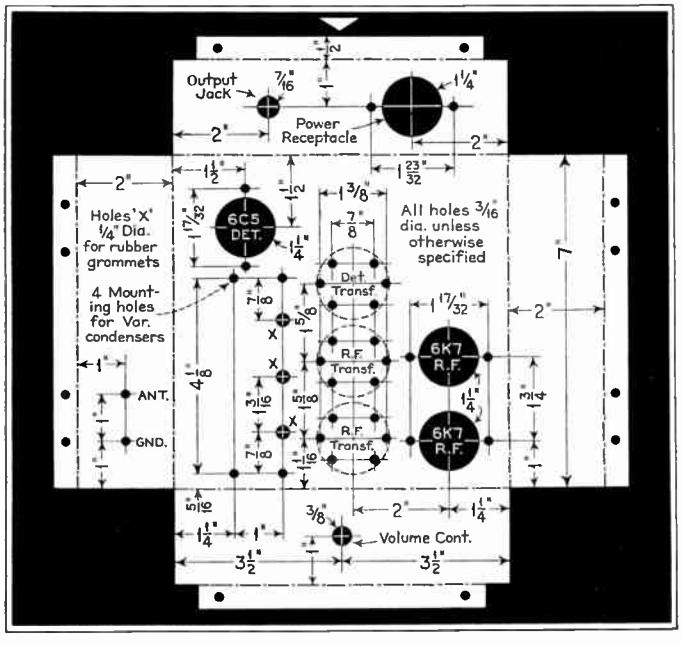
The answer to the problem in our case is the recently developed "infinite-impedance" detector circuit using a triode tube. This new arrangement not only provides practically distortionless detection—better than the diode—but also presents an extremely high impedance to the secondary of the detector r.f. transformer with a consequent increase in gain and selectivity over that obtained when using a diode. It is true that the infinite impedance detector cannot be used to provide automatic volume control voltage, as can the diode, but a.v.c. in itself can introduce distortion, and therefore has no place in a wide-range tuner.

The infinite-impedance detector arrangement is quite out of the ordinary. As indicated in the schematic diagram, the plate of the tube—a 6C5—connects directly to B plus rather than returning to this source through a resistance or a transformer winding. The load is actually in the cathode circuit of the tube and this consists of a resistance of comparatively high value. The audio voltage appears across this resistor and is fed to the grid of the first audio amplifier tube. Since d.c. plate current also flows through this resistor, a blocking condenser is employed to keep this voltage off the grid of the a.f. tube.

The advantages of the infinite-impedance detector are derived through the application of negative feedback or "degeneration" as it is more commonly referred to. The cathode resistor, R6, is common to both the grid and plate circuits. The introduction of this common impedance causes the degeneration, the effect of which is to cancel out harmonic distortion.

As in the diode detector, the "modulation capability" of the infinite-impedance detector is dependent upon the ratio between the a.c. and d.c. loads. The a.c. load is represented by the paralleled impedance of the input of the first audio tube—in our case the gain controls R3 and R20 in the grid circuit of the 6L7 tube in the amplifier unit. The larger this combined impedance is in relation to the detector cathode resistor, R6, the higher will be the modulation capabilities of the detector. A value of

(Continued on page 555)



Chassis specifications for the t.r.f. receiver. All dimensions are given and unit locations indicated.

Globe Girdling

By J. B. L. HINDS

THE NEW STATION LISTS . . . GREAT LAKES PHONE . . . XTB WAR NEWS . . . CXA2 ON 6000 . . . ECN1—BARCELONA . . . YSM—EL SALVADOR . . . QSL CARD RACKET

BRIEF mention of the change in form of the station list was made in the September issue, in which the first new short-wave broadcast station list appeared.

By this time you doubtless have had time to judge its merits by reason of its application to your use as compared with the former listing. But in order that you may be more fully advised of the changes made and contemplated, a more detailed outline of the plan is given here for your information.

It will be noted that only those stations broadcasting programs are included in the new list—that is, only those stations appearing in the August list that are designated by the large dots as being distinctly broadcast stations. It is proposed to run the broadcast list two months, and the complete list—including radiophone and experimental stations—each third month. The next complete list, therefore, will appear in the November issue.

However, the complete list will more than likely carry such data as is available on station addresses, signatures, signals, etc., for radiophone and experimental stations. By virtue of this plan, we will dispense with the station address and station signature sections as previously run, as all this data will appear in the revised list.

The information given under the heads, New Stations, Station Changes, Stations Deleted and Non-authenticated Stations, in this department will be continued so that you may easily note the various changes made in the monthly list.

The changes mentioned are tentative only, as we are anxious to have your comments and criticisms before getting under way. For that matter, we would like to have your version of the ideal station list, and what data it should and should not contain. For instance, just how important to you are time schedules, station addresses and signatures, and in the case of radiophone stations, the stations they work?

Some listeners think an ideal list should include only the frequency and wave length of each station, its call, and its location, on the basis that such a list, if complete and accurate, would be easier to read and check. That is undoubtedly true, but the nature of a list must follow the listening habits of the majority. If you *hunt* stations rather than *select* them, time schedules are probably of little value. On the other hand, station signatures are often of assistance in determining a station's identity when the call cannot be understood.

Possibly an ideal list is out of the question, but at any rate we wish to publish a list as close to ideal as possible. Your ideas are valuable in this respect, so let us know what you think would be the best possible list for general purposes.

NEW STATIONS

Kc.	*Meters*	*Call*	*Location*
11710	25.62	YSM	San Salvador, El Salvador
9925	30.23	JDY	Darien, Manchukuo
9840	30.49	COCM	Havana, Cuba
6000	50.00	CXA2	Montevideo, Uruguay

STATION CHANGES

New Frequency	*New Call*	*Old Call*	*Old Frequency*
12300	CB615	CEB	12300
11705	SBP	SBG	11705
6097		"Radio Burma"	6007
6065	SBO	SBG	6063

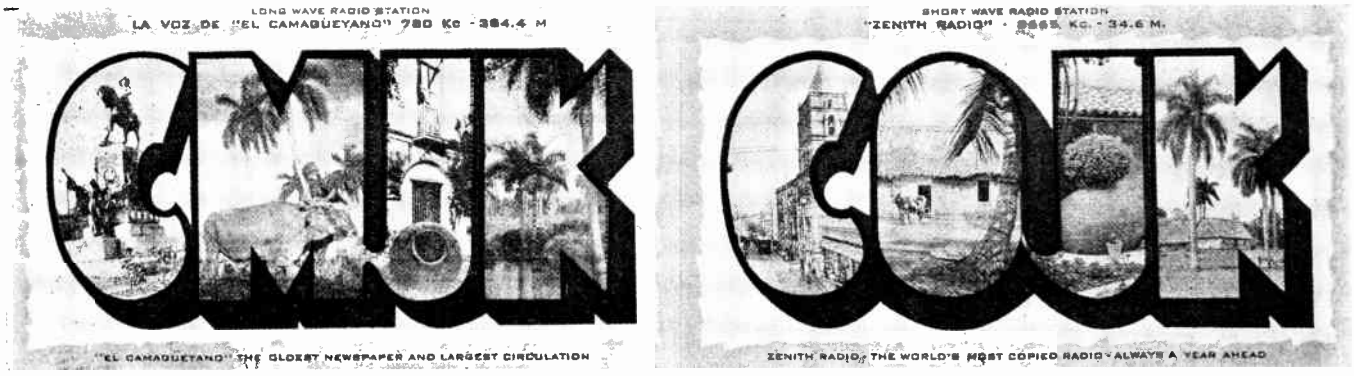
STATIONS DELETED

Kc.	*Meters*	*Call*	*Reason*
7080	42.37	PI1J	Not in service
6150	48.78	CB615	Not in service

NON-AUTHENTICATED STATIONS

Frequency	*Call*	*Location*
15650	JFZ	Japan (Oct.)
14010	VK5DI	Australia (Oct.)
12007	———	Chile (Sept.)
11710	XEWB	Mexico (Oct.)
9565	HP5S	Panama (May)
9175	CODX	Cuba (Oct.)
7600	HC1RJ	Ecuador (May)
7200	HC1AJ	Ecuador (May)
6600	HI6H	Dom. Rep. (May)
6128	OAX7A	Peru (May)
6122	OAX4P	Peru (May)
6122	OAX6A	Peru (May)
6120	HP5Z	Panama (June)
6090	XEBF	Mexico (Oct.)
6000	OAX5C	Peru (May)
5795	HI2H	Costa Rica (July)

The new photo-veri distributed by RKI, Radio Centre, Moscow.



Inside of latest CMJK-COJK blue, yellow and green veri which folds in half.

Radiophone and Experimental Stations

WQW, 10640 kc., Rocky Point, N. Y., is a new experimental station of R.C.A. Communications, Inc.

WMI, Lorain, Ohio, is used for ship-to-shore telephone service on the Great Lakes. It operates on three talking circuits and service is given to all points on the Great Lakes twenty-four hours per day.

The frequencies at the shore station are as follows: 2550, 6470 and 11370 kc. The corresponding circuits aboard ship are 2158, 6660 and 8820 kc., and also 13245 kc. on Lake Superior. The ship sets also have a ship-to-shore frequency of 2738 kc. Address: WMI, The Lorain County Radio Corporation, 203 Ninth Street, Lorain, Ohio.

FZE8, 17280 kc., Djibouti, French Somaliland, Africa, heard on West Coast about 8:30 a. m. calling and talking with France.

HSE2, 19020 kc., reported heard by West Coast listener contacting Germany between 8:30 and 9:15 a. m. and then changing to inverted speech. Siam has station HSC2 on 15530 kc. but no HSE2 on 19020 kc. unless since changed.

PLV, 9415 kc., Bandoeng, Java, contacts San Francisco at 9:50 p. m. Heard on West Coast.

XOJ, 15800 kc., Shanghai, China, heard on West Coast contacting KWE, 15430 kc., and KQZ, 17980 kc., Bolinas, California, at 6:40 p. m.

FNSK, S. S. *Normandie* uses American frequencies 17645, 13210, 8831 and 4412 kc. Heard recently on East Coast contacting WOO, 12840 kc., at Ocean Gate, N. J.

WQO, 12840 kc., Ocean Gate, N. J., radiophone station in list should read WOO, Ocean Gate.

New Mexican radiophone station heard nightly on East Coast between 7 and 8 p. m., calling Mexico, D.F., on or about 10570 kc. Station said to be located at Carman, Campeche, Mexico. Call not yet determined.

ZGB, Kaula Lumpur, Malaya States, heard in Australia calling PLQ, 10680 kc., at Bandoeng, Java, and announcing as working on 22 meters.

VK9MI, M. V. *Kanimbla* heard frequently with R8 signal on West Coast beginning transmission on 6010 kc. at 7 a. m. Ship's bells and whistle used as opening identification signals.

Sun and Dragon Stations

JZJ, 11800 kc., and JZK, 15160 kc., are still being used on regular Overseas broadcasts as shown in station list. Special test programs are also being transmitted on these frequencies between 6:30 and 7:30 a. m., 9 and 10 a. m. and 5:30 and 6:30 p. m.

JZK, 15160 kc., now appears to be the best frequency, coming in with a good R7 signal, the English news periods being quite clear and readable. JZK has been coming on the air with chimes, which are used at closing after the playing of the National Anthem. The National Anthem is not being used in opening on all occasions. JZJ, 11800 kc., seems to be meeting with difficulties in getting out without interference.

JIB, 10530 kc., Taiwan, Formosa, Japan, is broadcasting news in English 10:15 to 10:30 a. m., nearly every day, and occasional broadcasts for Tokyo between 4 and 9 a. m., E.S.T.

JVN, 10660 kc., Nazaki, Japan, is said to be heard now as late as 9 a. m.

JDY, a new Japanese station at Dairen, Kwangtung Peninsula, Manchukuo, is on the air between 7 and 8 a. m. broadcasting news in English, and permitting music at times. This station has been reported by several listeners.

XTB, 11415 kc., Shanghai; XTV, 9495 kc., Canton; and XTK, 9080 kc., Hankow, China, are reported as being heard nearly every day transmitting war news in English between 7 and 8 a. m. and interspersed with music.

JZF, 15650 kc., is the latest short-wave broadcasting station at Nazaki and not as yet included in the station list. It was heard just recently close to JVE, 15660 kc., Nazaki radiophone station, and was rebroadcasting JZJ and JZK and signed off at 9 a. m.

JZG, 6330 kc., was heard talking with JFCZ, *Chichibu Maru*, 8160 kc. Both stations reported by Harry Honda, Los Angeles, Calif.

Down Under Stations

VK3LR, Melbourne, Australia, 9580 kc., advises that when broadcasting its own independent programs, the station is announced as "The Australian National Short-Wave Station, 3LR Melbourne," but when it relays the local medium-wave programs the call sign 3LO or 3AR, Melbourne, may be heard.

On Tuesdays and Thursdays at 7 p. m., Australian Eastern Standard Time (4 a. m., E.S.T.) the station is announced in French, prior to a news service in that language. Apart from this there are no announcements in foreign languages. The signal of 3 notes on a gong may be heard between the various items on program, and in addition the usual time signals and Post Office chimes.

VK5DI, Adelaide, Australia, reported heard in early morning on experimental broadcasts on 21.42 meters (about 14010 kc.) relaying program of VK5AD at Adelaide. It is not known if this is one of the new stations to be installed by the Australian Post Office Department or not.

KZRM, 11840 kc. and 9570 kc., Manila, P.I., are the frequencies on which "Radio Manila" is being heard by many listeners. Mostly English used in announcements but some Spanish after 9 a. m. Further details of station will be given later.

PLP, 11000 kc., Bandoeng, Java, is being heard as early as 4:30 a. m.

CR7BH, 11718 kc., Lorenco Marques, Portuguese East Africa, is being heard on the West Coast between 9 and 11 a.m.

Northern Europe

OXY, 6060 kc., Skamleback, Denmark, is the call and frequency of the old transmitter.

The call and all frequencies of the new facilities have not as yet been determined. However, when the planned changes are completed, it is expected that they will transmit on 11805 and 9525 kc. and possibly additional frequencies. Test programs are now being broadcast on 11805 kc., usually from 5 to 10 p. m. and the signal is being received with fine

Quaint veri from OLR, Praha, Czechoslovakia, 11840 kilocycles.

volume and clarity and with no apparent interference from COGF on 11800 kc. or 2RO4, 11810 kc. It is understood that tests are also being made on about 31.5 meters or close to 9525 kc., but this frequency has not been listed. It is expected that advice will be shortly received from the station and calls and frequencies will be determined. In the meantime we are retaining OXY, 6060 and 11805 kc., in the station list.

The short-wave programs are intended primarily to interest Danish people living in the United States and other countries.

Because all plans for the operation of the new station are not yet completed, advance programs for overseas listeners are not yet available.

SM5SX, 15155 kc., is located at Stockholm, Sweden. SBP, 11705, and SBO, 6065 kc. are both at Motala, Sweden. It will be noted that neither frequency bears the call SBG and that the frequency heretofore shown as 6063 has been changed to 6065 kc. This information was supplied by the Director General of Swedish Telegraphs, Radio Department, who also furnished the schedules as shown in station list.

SPW, 13635 kc., Warsaw, Poland, is broadcasting on Sundays from 11:30 a.m. to 1:30 p.m. instead of 12:30 to 1:30 p.m. as previously stated.

A new 10-kw. short-wave station is reported under construction at Athens, Greece. It is expected to be in operation early in 1938.

Lahti, Finland, is to be the location of a 1-kw. short-wave station reported under construction. A more powerful station is to be constructed later, but it is not known definitely if it is to be located at Lahti or Helsingfors.

Central Europe

The new short-wave station under construction at Kovna, Lithuania, is said to be nearing completion and will soon be in operation.

The League of Nations advise they will broadcast daily during the Assembly Session which occurs between September 13 and October 2, although the time of broadcasting or the frequencies to be used are not given. It is possible that those broadcasts of the day's discussions and conclusions will be carried on HBL, 9595 kc., and HBP, 7797 kc.

CSW, 11040 kc., and 9940 kc., Lisbon, Portugal, is now broadcasting from 12 noon to 5 p.m. on first named frequency and from 5 to 9 p. m. on last named.

PI1J, 7080 kc., Dordrecht, Holland, which has been carried for some time in station lists has been dropped, as no reports of its being heard have been received, nor advice received from the station that it is on the air. No letters returned, however, as being undelivered.

OER, Wien, Austria, in closing announcement on 11801 kc., is said to mention call as OER3 and also refer to OER2 on 49-meter band. If station is heard, reports to this department would be appreciated.

South America

CXA2, 6000 kc., Montevideo, Uruguay, is another new South American station listed in this issue. Advice from the station is that it went into service on August 1st last with 5 kw. power. They are broadcasting simultaneously with the Argentina station LS2 "Radio Prieto" (1190 kc., 252 meters, 30 kw.) and also with other broadcasting stations in the interior of Argentina and Uruguay. Station is owned by Cia de Radiopublicidad Continental, whose address is Rio Negro 1631, Montevideo, Uruguay. Only Spanish used. Opening selection, "Voluntary Trumpeter," closing, "Good-Night Melody." Station on the air from 12 noon to 12 midnight, Uruguay time, or 10:30 a. m. to 10:30 p. m., E.S.T.

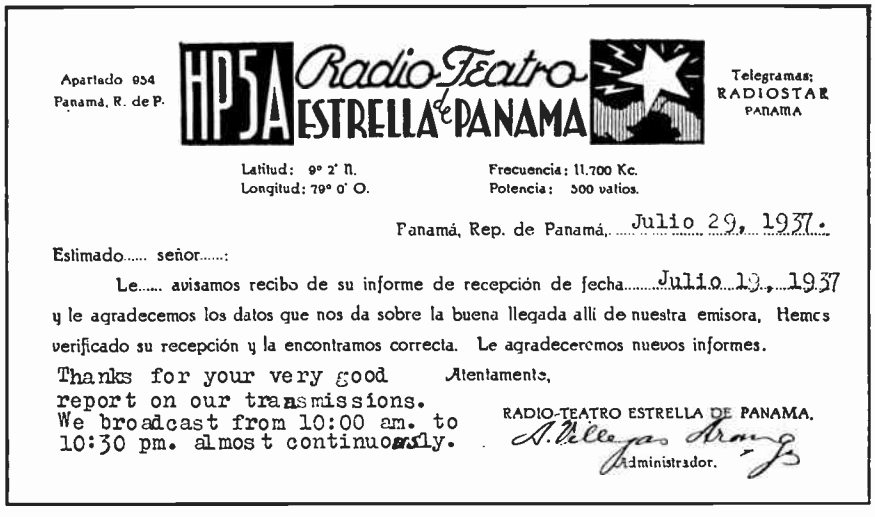
OAX5A, 11796 kc., Ica, Peru, announce occasionally in English. Opening selection is the march, "Relator." Closing, "Estrellita."

OAX4Z, 6092 kc., Lima, Peru, is reported by many as heard on 6080 kc. OAX1A, 6150 kc., Chiclayo, Peru, is reported heard near 6350 kc. No change will be made until we hear from Peru.

The station close to 12,000 kc. mentioned in September issue is evidently located in Santiago, Chile. Some say the call is CB1109 and that the station is called "Radio Vitalacio." The code interference is very bad at this point. Time and patience is required to learn the identity of stations operating near this frequency. In tuning here the writer has been hearing harmonics of COCO and W8XAL. Also QRM from a station near 12050 which often broadcasts badly worn records for 30 minutes or more, one day using "Ramona" and the next "Hallelujah," or talks of 5 minutes in French, a man and woman alternating. "Ici Moscow" was heard by one listener. Spanish also used. It is suggested that those who have a little time set in and endeavor to unravel the puzzle.

HJ1ABB, 9560 and 6128 kc., Barranquilla; HJ2ABC, 9575 kc., Cucuta; and HJ3ABD, 6050 kc., Bogota, Colombia, are still broadcasting on approximately 4780, 4785 and 4850 kc., respectively, as shown in list. It is thought best to make no change in list until exact frequencies are known and the intention of the station determined. Mention is again made so that our readers will understand the situation. To illustrate the viewpoint, late reports indicate that HJ1ABB was heard again on the 31-meter band.

VP3MR, 6010 kc., Georgetown, British Guiana, still heard around 6070 kc. Station probably on the latter frequency,


Apartado 934
Panamá, R. de P.

HP5A Radio-Teatro ESTRELLA de PANAMA

Telegramas:
RADIOSTAR
PANAMA

Latitud: 9° 2' N.
Longitud: 79° 0' O.

Frecuencia: 11.700 Kc.
Potencia: 500 vatios.

Panamá, Rep. de Panamá, Julio 29, 1937.

Estimado..... señor.....:

Le..... avisamos recibo de su informe de recepción de fecha..... Julio 19, 1937 y le agradecemos los datos que nos da sobre la buena llegada allí de nuestra emisora. Hemos verificado su recepción y la encontramos correcta. Le agradeceremos nuevos informes.

Thanks for your very good report on our transmissions. We broadcast from 10:00 am. to 10:30 pm. almost continuously.

Atentamente,

RADIO-TEATRO ESTRELLA DE PANAMA.

A. Villegas Arango

Administrador.

New HP5A veri in black and white. Schedule on card.

but we are awaiting advice from there.

A Spanish station was heard by the writer on a recent Monday night, on about 8065 kc., broadcasting a Spanish program throughout and closing with an organ selection just about 10:30 p.m.

ECN1, Barcelona, Spain, war station, on 6995 kc., verifies on that frequency.

EAQ, 9860 kc., and EAR, 9480 kc., Madrid, Spain, do not verify reception or reply to letters unless International Reply Coupon is furnished.

Cubans

CO9BC, 9400 kc., Havana, Cuba, is closer to 9310 than 9400 kc. The call COBC is also heard at times, which would indicate a change from experimental to commercial broadcast. They relay the programs of long-wave station CMBC on 630 kc.

COGF, 11800 kc., Matanzas, Cuba, quite often presents the organ selection "Among My Souvenirs," usually on the hour. The programs of this station have a much more varied selection of offerings than the usual run of Cuban stations.

COCW, 6330 kc., Havana, Cuba, verified by letter covering the reception by the writer and states that the station is on the air daily from 7 a. m. to 12 midnight with 200 watts power. Address Apartado 130. Station known as "La Voz de las Antillas."

COCM, Havana, Cuba, mentioned in "Last Minute Flashes" in September has been reported heard from 9830 to 9875 kc. Address is said to be P. O. Box 33, Havana. Station has been added to list on 9840 kc., until frequency is learned.

COBZ, 9030 kc., advises they announce in English and Spanish at 15-minute intervals and employ 4 chimes (struck) regularly. A record, "Popular Melodies," is played at the opening and closing.

COCO, 6010 kc., Havana, Cuba, is heard on a harmonic at 12020 at times.

CODX, 9125 to 9175 kc., may be the call of another Havana, Cuba, station which is being heard of late with a too heavily modulated signal. The writer heard it near 9175 kc.

COJK, 8665 kc., Camaguey, Cuba, which relays the programs of CMJK on 780 kc., is sending out its verification cards covering reception reports filed with them during the past few months. A letter from them advises that they did not receive their new cards until the end of July and at that time had over three thousand reports to answer and have possibly been a little slow in getting them sorted out, written up and answering the many questions of listeners. The card is worth waiting for, it being in folder form, the outline of call letters of long and short waves being filled in with various scenes and pictures of life in Cuba, and a brief description of Camaguey printed on the back of the card.

COJK may be identified by a three-toned gong with station announcements each quarter hour in Spanish. English announcements every half hour. Weekday schedule is 10:30 a. m. to 12:30 p. m. and 7 to 10:30 p.m. Sunday from 10 a.m., to 12:30 p.m. only.

All programs commence with "Allegiance March." No closing selection used. Station known as "Radio Zenith."

TIRCC, 6550 kc., San Jose, Costa Rica, has changed time schedule. Station uses 500 watts power.

TI2H, San Jose, Costa Rica, still on the air nightly, if call is correct. No report yet received from Spanish listeners. Station will not be listed until facts are known.

French Colonial

The new French station which is being heard near 9685 kc., is said to be located at Fort de France, Martinique, but it has not been learned whether or not this is "Radio Fort de France," listed on 9450 kc., and shifted to the above mentioned frequency.

The station on 9685 kc., however, opens and closes its transmissions with the French National Anthem, "La Marseillaise." On one occasion an announcement was heard after the playing of the National Anthem. Regardless of its location it is coming in with a consistent and clear signal. The latest transmissions heard have been mostly between 6:30 and 7:30 p. m., although it has not adhered to this schedule throughout.

YSM, 11710 kc., San Salvador, El Salvador, is a new station—and a new country—for listeners to add to their collection of verifications. This station is broadcasting on the above-named frequency with good signal and clarity. They have been testing for modulation and requesting reports.

YSM relays the programs of long-wave station YSS on 638 kc. Reports should be sent to Director of Communications, Radio YSM, San Salvador, El Salvador, C.A.

Several programs of the West Indies Oil Company were relayed by this station on these test transmissions. On one or two occasions the writer heard them announce about 9:30 p. m., that they were then changing to 9520 kc., or 31.55 meters (which is 9510 kc.) but was unable to intercept them. This would indicate they have more than one assigned frequency. Frequent announcements are made in English.

Panama and Mexico

HP5K, 6005 kc., Colon, Panama, uses three chimes similar to those used by N.B.C. each 15 minutes, at which announcements are made in English and Spanish. They use the selection, "Merry Widow Waltz" at opening and closing of each day's program.

Attractive photo-veri from XEBM, Mazatlan, Mexico. Frequency is 15400 kc.

HP5A, 11700 kc., Panama City, Panama, advise station called "Radio Teatro Estrella de Panama." Veri card shows power as 500 watts—not 3 kw. as reported. They are on the air daily from 10 a. m. to 10:30 p. m.

XEWW, Mexico City, was heard on 10390 kc. and veri card received. This station also transmits on 9500 and 15160, although assigned frequencies are 9500 and 6080 as previously mentioned. One other listener reports the 15160 kc. frequency with call XEWW-3. This station may some day find a frequency on which to transmit.

XEBF, 6090 kc., Jalapa, Mexico, and XEWB, 11710 kc., Guadalajara, Mexico, are two new stations authorized for operation and may be on the air soon.

XEBF is operated by Pedro Coronel Aburto. 100 watts power. Address: Insurgentes No. 34, Jalapa, Ver., Mexico.

XEWB, operated by Camara de Propietarios de Guadalajara. Address: Judrez 289, Guadalajara, Jolisco, Mexico. 15 watts power.

U. S. and Canada

W9XAA, 11830 kc. and 6080 kc., are on the air again with new transmitter. The 17780 kc. frequency is not being used at present.

W8XAL, 6060 kc., Cincinnati, Ohio, is throwing a real good harmonic on 12120 kc., and it is therefore possible to receive the ball game in the afternoon at times with better reception than on its assigned frequency.

The General Electric Company has asked for authority to build a new international short-wave station at Belmont, California, near San Francisco, to be operated on 9530 and 15330 kc., with 20-kw. power. The frequencies are the same as now used by stations W2XAF and W2XAD, Schenectady. Difference in time between Schenectady and Belmont will enable both stations to operate full time. This station will be designed to broadcast to the Far East, and will broadcast between midnight and 6 a. m., P.S.T., so as to suit the convenience of listeners in Manila, Tokyo, Shanghai, Calcutta, Sydney and other Far Eastern cities. Two uni-directional antennas will be installed at Belmont so that a strong signal may carry the programs eastward.

VE9CA, 6030 kc., Calgary, Alberta, Canada, advise they have no station chimes or signals. Station call is "The Voice of the Prairies." No special opening selection, but they close each program with "Lights Out." Not bad.

Amateur Phones

The following is a list of 20-meter amateur phone stations reported in late lists and which have not been shown previously in this section.

Country	*Frequency**	*Calls*	*Time Heard*
Australia	LF	VK2HP—2ADE	5:55 and 7 a.m.
Australia	LF	VK3XU—3KI	4 to 6 a.m.
Australia	HF	VK3UC—3JH—3IW	6:30 to 7 a.m.
Australia	LF	VK4WU—4KO	4-5 a.m.
Australia	LF	VK5KC—5JC—5RJ—6WS	4 to 7:05 a.m.
Africa (French Morocco)	LF	CN8AJ	6:05 p.m.
Alaska	AB	K7VA	3 to 5 a.m.
Alaska	AB	K7FST	7 to 8:05 p.m.
Bahamas	LF	VP7NC	9 p.m.
Belgium	HF	ON4MW	5:54 p.m.
Brazil	LF	PY2AL	6:50 p.m.
Brazil	HF	PY2DU	6:37 p.m.
Chile	LF	CE3EN—2CO	5:10-7 p.m.
Cuba	HF	CO2RO—2EO	6:04-7:20 p.m.
England	LF	G5KJ—5SS—5WP	4:30-5:40 p.m.
England	LF	G8MG—G5OS	5:50 p.m.-1:10 a.m.
England	HF	G6TZ—6PC	4:43-5:07 p.m.
France	HF	F8ER	5:52 p.m.
Guatemala	LF	TG1AA	8:15 p.m.
Hungary	LF	HA8N	10 p.m.
Holland	LF	PA0AD	6:26 a.m.
Hawaii	AB	K6BNR	5:15 a.m.
Ireland	LF	G5IOX	5:44 p.m.
Italy	HF	I1CKM	8:10 p.m.
Java	LF	PK4VR—1RF	6-6:30 a.m.
Malaya States	HF	VS2AO	6 a.m.
Mexico	HF	XE1XK—2BA	9:10-10:03 p.m.
Spain	LF	EA1R	8 p.m.
Tasmania	LF	VK7YL	5:40-6:30 a.m.
Venezuela	LF	YV3AA—YV5ABT	8:44 and 6:30 p.m.

*LF: Low-frequency end of 20-meter band. HF: High-frequency end of 20-meter band. AB: American band—within limits of U. S. amateur 20-meter band.

ZL2BE, New Zealand, a 75-meter amateur, is reported heard on West Coast near 3900 kc., or 76.19 meters between 8 and 8:30 a.m.

Address of EA9AH, 20-meter phone, is Apartado 124, Tetuan, Spanish Morocco, Africa.

Speaking of QSL cards—the writer recently heard one amateur state that he was seriously considering going off the air due to the fact that he was receiving 50 to 60 requests for QSL cards from SWL's every week, and as he was compelled to make a living he could not keep up with the game. Another amateur was heard to remark that he had his call in large type in the Call Book, followed by the phrase, "All SWL and QSL cards answered." The party went on to say, "Don't ever make that mistake. I have received hundreds of SWL cards from listeners who have seen the comment in the Call Book and who have just sent me a card, giving me a 5/9 report, trusting that I was on the air at the time they mentioned, or that I would not compare their reports with my log book."

This amateur said he was always glad to answer honest reports, but did not intend to supply wall paper for fake reports just scribbled on a post card. Moral: Do not request a QSL card unless you heard the station and can furnish information of value to the operator.

LAST MINUTE FLASHES

T12H is call of station at San Jose, Costa Rica, mentioned in previous issues. The frequency is 5813 kc. and station is operated by Senor Gonzalo Pinto H, who is owner and operator of TIGPH.

W2XAD, 15330 kc., Schenectady, N. Y., is now on the air from 11 a.m. to 6 p.m. with a beam directed toward Europe, and from 6 to 9 p.m. daily with a beam directed to South America.

Radio Wien, Austria, advise OER2 is on 6072 kc. and OER3 on 11801 kc., both stations transmitting by turns on all week days.

"Radio Renascensa", Lisbon, Portugal, is reported on 5977 kc. with 250 watts power. It is said that power will soon be increased to 2.5 kw.

Amateur station HO2U, 14140 kc., is on a ship on around-the-world cruise, westbound from San Francisco, and will complete the circuit in a year. On the air 9 a.m. and 3 a.m. Will QSL all stations and listeners. Power 100 watts. Address Radio station HO2U, P. O. Box 181, El Cerrito, California.

YV2RA, 5755 kc., San Cristobal, now operating with one kilowatt power.

Chinese or Japanese station near 9630 kc. heard on West Coast 7 to 10:30 a.m., E.S.T.

Call of San Salvador station when on 9520 kc. is said to be YSD or YSH. Station also reported heard on an announced frequency of 7894 kc., call not heard.

PRF5, Rio de Janeiro, report frequency as 9501 kc. On 4:45 to 5:45 p.m. daily except Sunday. Transmission in German on Wednesdays is broadcast over station PSE, 14935 kc., from 4 to 4:10 p.m. See June "Radiophone and Experimental Stations" in Globe Girdling.

A neat card in blue and red from CB960, Santiago de Chile.

Acknowledgements

We are afforded much pleasure in acknowledging letters and reports from Kenneth Axelson, W11H18, Chicago, Ill.; John Bertuch, Jr., Mt. Vernon, N. Y.; Elvyn L. Barker, W3E4, Portland, Me.; William T. Bailey, Jr., Nashville, Tenn.; Mario Cassina, Bronx, New York City, N. Y.; Bill Dalrymple, Arlington Heights, Ill.; Thomas Douglas, VE29A4, New Westminster, B. C., Canada; Herbert Kerlinger, Berkeley, Calif.; Martin Miller, Bronx, New York City, N. Y.; A. R. Ogden, Brooklyn, N. Y.; Stanley Rosenberg, Far Rockaway, N. Y.; Joseph A. Slezak, W11H26, Chicago, Ill.; R. G. Summers, Buffalo, N. Y.; Robert Stein, W4H109, Brooklyn, N. Y.; Mrs. H. I. Trammell, Redmond, Wash.; Anthony Tarr, W29B4, Seattle, Wash.

Hamfest

By W8QMR ex-2PI • LU4S

TO GET THE RECORDS STRAIGHT . . . HAMFESTERS AND QSODORS . . . OTs AND LIDS

ONE of the most important points we wanted to bring out last month, in reference to the possibilities of a more or less nominal tax on transmitters, came through about as garbled as a lid's product with a brand new bug. We refer specifically to our third paragraph as carried over to column two. Our original words, before the compositor practiced mayhem upon them, were to the effect that the income from such a tax would be used by the government solely for the improvement of the federal radio functions—the inspection and monitoring services, etc. An endeavor was made to draw a parallel between such a tax and expenditures and the state use of gasoline taxes for highway improvement.

Here's hoping it comes out straight this time!

✦

JOHN SANFORD, W2KDV, sends us the accompanying photo of his rig. KDV is an ex Morse man—which reminds us that it might be a good idea for us to brush up on our Morse and perhaps form a Morse club on 80. KDV was in the Signal Corps and remembers the old VT-1s and VT-2s—vintage about 1920. We remember them too—we bought a dozen or so from a gob and almost landed in Atlanta.

The receiver is a Sky-Challenger—with the monitor immediately to the right in the black can. The 80-meter transmitter uses a 6L6 with 25 watts input. The power supply is in the steel cabinet to the right—as is a 160-meter fone transmitter.

Photos of ham stations are always welcome here. How about yours? Just to make it interesting, we'll donate a year's subscription to the best one received every month.

✦

THOSE OF YOU who enjoy a good ragchew, try and hook up with W2BSK at the Mount Whiteface Observatory in the Adirondacks overlooking Lake Placid, N. Y. He has the watch every other night, and is on from about 10 p. m. to 2 a. m., Eastern Standard Time. Ben is a good op and can cover considerable territory in one hour—which is about the duration of our QSOs. Just to break the ice, ask him what kind of goats he prefers—blondes or brunettes. (His QRG is 3510 kc).

BSK is scheduled to be stuck up there all winter—with six cases of liquor. Well, that ought to see him through the holidays anyway. Ordinarily he uses break-in—but there's no stopping him once he's started on a story—even if you've heard it a dozen times before.

✦

ONE OF THE WORST hamfesters on the air these days is the misuse of the simple letter R. R is supposed to mean exactly one thing—Okay, every word received. To rattle off a flock of Rs, and then the addendum—"OK, om, I pulled you through solid" is not merely superfluous but indicates a degree of cranial solidity as well. Still worse is to send "R, R, R" and then meander through a detailed acknowledgment—"OK on your fb report . . . OK on your QRA . . . OK about your this that and the other." When you send "R" you have already indicated that you received all the dope beyond a reasonable doubt of accuracy. Of course, about the worst of all is to come back with a snappy high-powered McElroy "R," and then make a liar out of yourself with—"Sorri ob—I missed out on that—QRM—QRN—."

Perhaps there should be some convention for indicating partial reception—for instance "R?" The letter R followed with the interrogation would indicate that some but not all of the transmission had been copied perfectly—and the operator could then ask for a repeat on the dubious portions.

Another hamfester in the same category is the lad whose CQ you answer. He comes back with an "fb, om" and gives you an RST 589X. You return the compliment, tack on your QRA (or QTH if you insist) and he replies with a "sorri om—QRN, QRM—etc., etc." Obviously, if things were as bad as that, his original report to you should have been an R2 or 3.

✦

SPEAKING OF QRA—QTH, we got into an argument on that point with N2HJT. N2HJT is a commercial operator and he says that as far as he and the rest of the professional brass pounders are concerned there won't be any hair splitting so far as land stations go, and that it's still QRA to him.

This led to a conversation concerning the Q sigs in general, and neither of us could figure out why they had ever been changed back in 1928-9. How many of you old timers remember when QRH meant what is your wavelength, instead of QRG . . . when QRL was a request for a test signal instead of QSV . . . when QRW meant are you busy instead of QRL . . . when QSR meant will you relay instead of QSP . . . when QSK meant cancel the last msg instead of QTA, and QTA meant please repeat

(Continued on page 560)

W2KDV, owned and operated by John Sanford, an old Morse man.

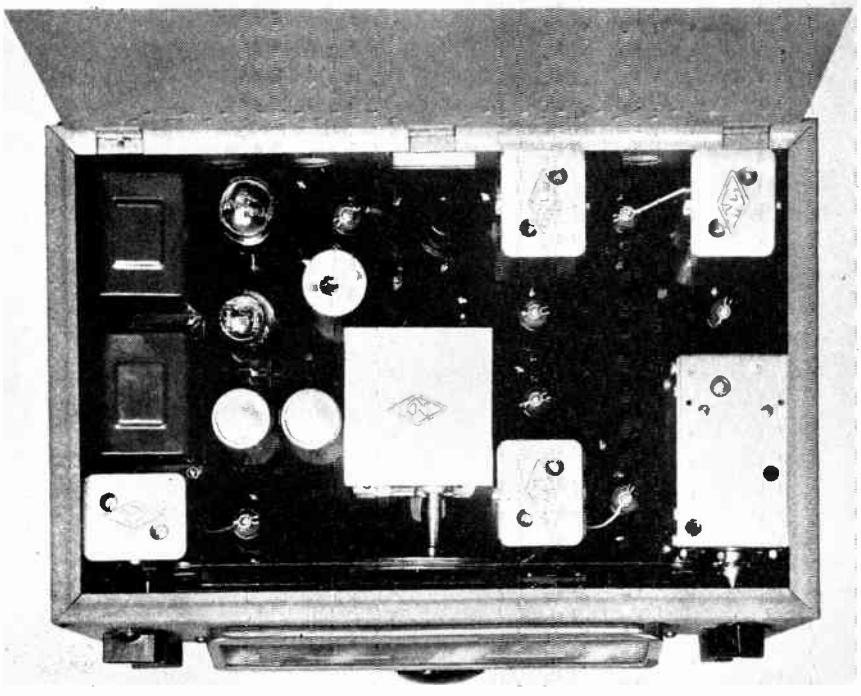
NEW NATIONAL NC80X RECEIVER

LISTENERS and amateurs with an eye out for a moderately-priced receiver having the basic features of a communications job will find the new National NC80X and NC81X models appealing. The NC80X, of particular interest to the listener, covers the band from 550 kilocycles to 30 megacycles. The special amateur model, the NC81X, covers the ham bands only—with 160 meters as one limit and 10 meters as the other.

With the exception of band coverage, both models are of identical design. The salient features are: a new type full-vision dial with frequency markers, automatic plug-in coils, a.c. or d.c. operation, continuously variable crystal-filter selectivity, and an undistorted output of 2 watts.

Mechanical Features

Three views of the receiver are shown. The front view shows the full-vision, multiple-scale dial, which is mounted at a slight angle to the plane of the front panel to improve scale readability. The vertical hair-line indicator travels horizontally over the scale face and is controlled by the large knob in the center of the panel which has reduction ratios of 16 and 80 to 1. Between the frequency scales and the auxiliary linear scale at the bottom is a mirror which overcomes parallax.



Looking down into the chassis of the new National NC80X receiver. A crystal filter is employed which is in circuit continuously.

The four frequency scales are calibrated in megacycles. The auxiliary scale at the bottom is calibrated in degrees. Grouped along this scale are a series of adjustable frequency markers by means of which any particular stations, or frequencies, such as band limits, may be logged on the dial itself. Such logging is highly accurate since the vertical frequency indicator is common to all five scales.

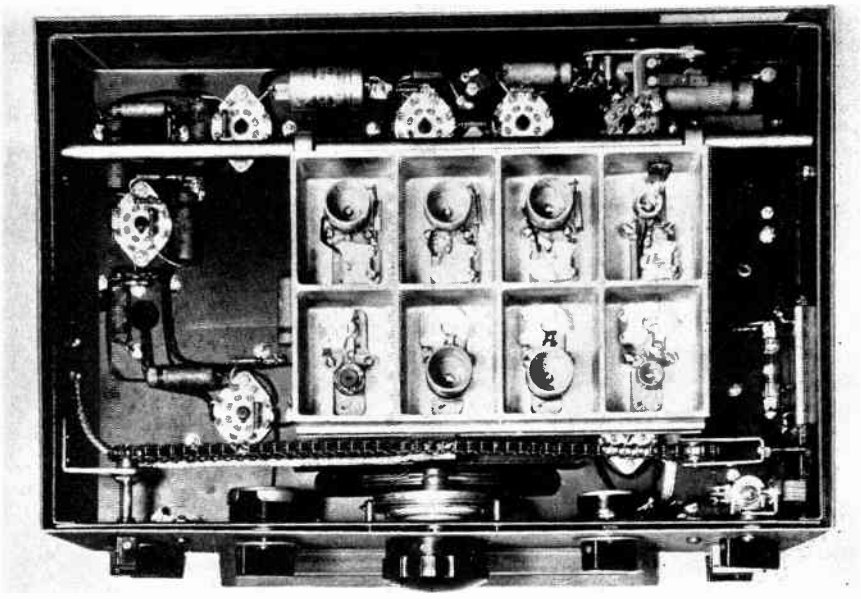
On the left side of the panel, from top to bottom, are: the c.w. oscillator off-on switch, the c.w. oscillator frequency control, and the r.f. gain control. The bar knob just to the right of the r.f. gain control is the power switch which has a third position—Send—in which B power is removed from the tubes. The a.v.c. toggle switch, which gives the operator the choice of manual or automatic gain control, is located directly under the large tuning knob. The bar knob to the right of this switch operates the automatic plug-in coil band-changing mechanism. This control has four positions.

On the right side of the panel, from top to bottom, are: the crystal filter selectivity control, the crystal phasing control, and the a.f. gain control. The selectivity range of the crystal filter is so wide that the crystal filter is left in cir-

cuit at all times. It is continuously variable from 300 cycles for single-signal c.w. reception, up to 7 kilocycles for high-quality broadcast reception!

The view of the receiver looking down on the chassis shows the location of the principal components. On the left side, from front to rear, are the beat oscillator and transformer and power-supply filter chokes. To the right of these are the filter condensers, the 25Z5 rectifier and the 25L6G beam power tube. The gang tuning condenser is enclosed in the central shield. To the right of it is the transformer and tube comprising the first i.f. stage, then the crystal-filter unit. The second and third i.f. stages, as well as the second detector, are in line at the rear of the chassis.

The third, under-side view of the receiver shows the automatic plug-in coil mechanism. Each coil is in a separate shielded compartment, and all eight of the coils for the four frequency ranges are trimmed with air dielectric condensers. The coil-shield compartment is a single aluminum casting which travels on a "track." The movement is controlled by the wave-range knob on the front panel through a chain drive, which may be seen in the under-view illustration.



Looking into the bottom of the receiver. This shows the automatic plug-in coil mechanism and the coil shield which is a single aluminum casting.

The Circuit

The circuit of the receiver is unusual. It will be seen that there are 10 tubes in all, the types and functions being as follows: 6J7 first detector; 6J7 high-frequency oscillator; 6K7 tubes in the first, second and third i.f. stages; a 6C5 linear second detector; 6J7 beat-frequency oscillator; 6B8 amplified and delayed a.v.c.; 25L6G beam-power audio output; and a 25Z5 rectifier.

The main problem involved in the design of this receiver was the attainment of adequate sensitivity, selectivity and image rejection without the use of one or more preselector stages. The addition of even one good r.f. stage would have defeated the prime purpose—the production of a low-cost set having the desirable features of a "communications type" receiver. New circuit design was therefore a necessity.

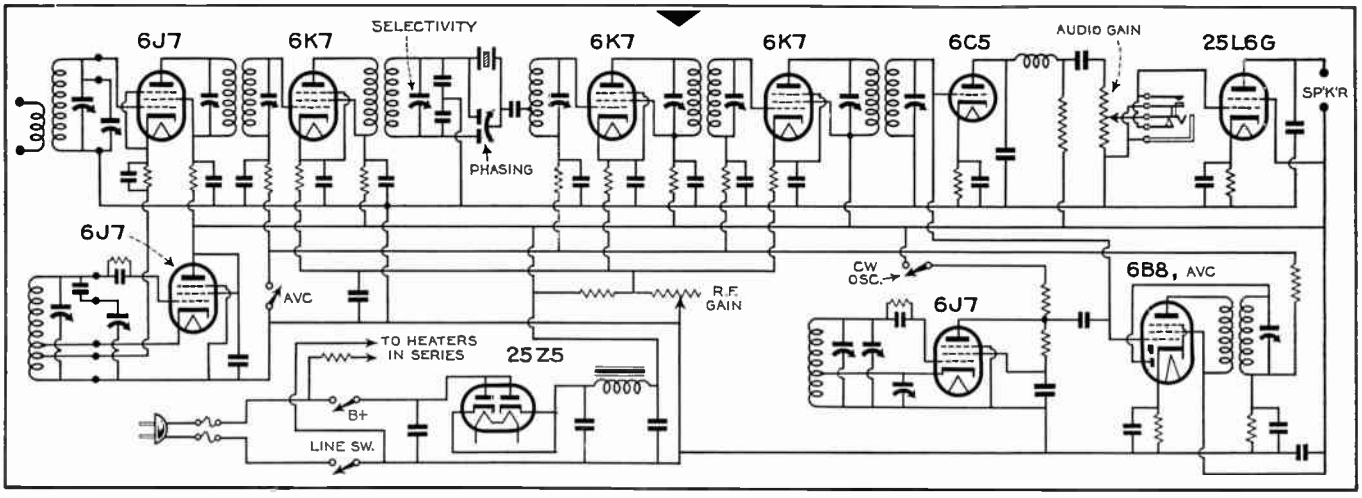
The solution to the problem was found through the use of a high-gain first-detector stage working into a three-stage i.f. amplifier, with special crystal filter, operating at a frequency of 1560 kc. rather than the usual 465 kc.. Insofar as image rejection is concerned, this high intermediate frequency makes up for the inadequacies of a circuit devoid of preselection, since the image frequencies are removed by 3120 kc. With such a spread between fundamental and image frequencies, the signal-to-image ratio is sufficient with only the tuned first-detector circuit.

The high intermediate frequency does not in itself improve the signal-to-noise ratio of the receiver, but it permits the use of a new crystal filter which, as previously mentioned, has continuously variable selectivity from 300 cycles to 7 kilocycles and remains in circuit at all times. By operating with optimum selectivity, the noise can be reduced sufficiently to make the signal-to-noise ratio fairly good. The problem of noise, therefore, becomes less acute, and under conditions of actual operation can be kept under satisfactory control.

Sensitivity and Control

With the crystal filter assuming the burden of contributing selectivity and a satisfactory signal-to-noise ratio, the three-stage i.f. amplifier, in conjunction with the first detector, accounts for receiver sensitivity. Even with the high i.f. employed, the three intermediate stages supply more than adequate gain. Moreover, such signal gain contrived in the first detector-i.f. stages is not partially sacrificed in the second detector stage,

(Continued on page 554)



Circuit diagram of the new NC80X a.c.-d.c. receiver. A high i.f. is used to prevent image interference and gain wide crystal selectivity.

Night-Owl Hoots

By RAY LA ROCQUE

AWR DX CONTEST RULES . . . TORONTO VERIES CEASE . . . OCTOBER DX FORECAST CUBAN CONFUSION . . . 50 KW FOR XEIO . . . XEB VERIES . . . WNBR TO WMPS

HEAR YE! Hear ye! The time has come to enroll for ALL-WAVE RADIO's 1937-38 DX Contest. The official opening date being a little more than one month away, this will be the last call for contestants who wish to be placed on a team, or for clubs who wish to be represented by a team in the contest. All team contestants must be enrolled by October 20, 1937. In order to be enrolled in the contest as a member of a team, just send your name and address to the Chief Night Owl and inform him that you would like to be in the contest as a member of a team. Whole teams enrolling for the contest must state the name and address of each of its four members and the proposed name of the team.

Contest Rules

Below will be found a complete set of rules and regulations. As will be noticed, there has been a change made in the scoring rules since last month's announcement. There will still be two competitions each week as announced, but instead of being on two specific dates, namely Saturday and Sunday, contestants will be allowed to DX on any day of the week, the week being divided into the first and last half to provide time for two competitions. This change has been made to avoid limiting the contestant from any specific date and to permit him to DX at his leisure. By limiting the contestant to 10 reports per period contestants who have much time on their hands will not have an unfair advantage over those with limited leisure hours. Other than this there has been no change in the rules as announced last month.

The rules follow:

Participants are required to send reports on stations located in the band 500 to 1600 kc. heard during the contest to Ray La Rocque at 135 Highland St., Worcester, Mass. Reports must be in accordance with the following rules:

1. *Eligibility*: Any person able to twist a dial is eligible to participate in this contest, employees of AWR excepted.

2. *Reportable Stations*: Stations in the United States or Canada can be reported only on DX or test programs (any program which deviates from the regular daily schedule of the station). *All foreign stations* may be reported at any time during the days of competition.

3. *Reports*: Reports must be made on 3 by 5 inch slips of light-weight bond paper—(obtainable at any stationery or five-and ten-cent store for about one cent per pad) and each report must contain at least one definite item which can be checked for verification, as well as all the technical information shown in the sample report illustrated on this page. It is preferable, but not necessary that you arrange your report similar to the one shown. Reports must be written in ink or typed. No pencil reports allowed.

4. *Scoring*: Competition will be divided into two groups. Participants will participate individually as well as in teams. Each individual competitor does not necessarily have to be a member of a team, but each team member automatically becomes an individual participant. Scores will be totaled twice weekly (not monthly as last season). The first competition will include Sunday, Monday and Tuesday; and the second, Wednesday, Thursday, Friday and Saturday.

4-a. *Individual Contest:* Each contestant will enter on separate slips reports for his 10 best stations for each semi-weekly period of competition. As last year we are assuming that the station heard by the least number of DXers each period is the best catch. So 100

STATION CHANGES, U.S.A.

Old Call	*New Call*	*Location*	*Frequency*
WTFI	WAGA	Athens, Georgia	1450
WNBR	WMPS	Memphis, Tenn.	1430
———	WFAM	St. Cloud, Minn.	1420
———	KELA	Centralia, Wash.	1440
———	KTBC	Austin, Texas	1120
———	KRAB	Lufkin, Texas	1310
———	KARM	Fresno, Calif.	1310
———	KTRI	Sioux City, Iowa	1420
———	KDTH	Dubuque, Iowa	1340
———	WBRK	Pittsfield, Mass.	1310
———	WSAL	Salisbury, Md.	1200
———	WLAW	Lawrence, Mass.	680
———	WTOL	Toledo, Ohio	1200

STATION CHANGES, FOREIGN

All foreign station changes are included in the revised world station list appearing in this issue. Major changes are noted in Kilocycling Around.

Photo-veri issued by KWYO, Sheridan.

Westbrook, Nevada
July 21, 1938 4:10 p.m.

WXBZ
810 kc.

Sig.—QSA5/R9, severe QRM de CMOB, slight QRN and slow, shallow fade.

4:10 p.m. "Hallelujah"
4:16 p.m. "Moonlight & Kisses" waltz.
4:22 p.m. "When the Bluebird Comes Home"

RECEIVER: RX-2Z ANTENNA: Inverted L pointing east.

Mr. D.X. Tilldawn
234 West 8th St.,
East Bronx, Ill.

How to make up your station reports for the AWR DX Contest. The 3 by 5-inch sheets can be purchased at any stationery store in tablet form.

points will be awarded for each station heard during each competition. This 100 will be divided equally among the contestants reporting that particular station. Hence the more reports there are on a station, the less the score will be on that station. Scores will be totaled twice weekly instead of monthly as last season and instead of counting totals, an average will be maintained by dividing the total points by the number of stations reported; i.e., ten per competition. If a contestant should fail to report the required number of stations, his score will be divided by 10 just as it would be if he had submitted the full number. The contestant having the highest average at the close of the contest will be declared winner.

4.-b. *Team Scoring*: Any four contestants may join together to form a team, assuming a common name. Each member of the winning team will receive an award, regardless of his own individual standing. It is preferable, but not necessary, that teams represent a specific city, state, section, or club. All teams must be entered by October 20, 1937. A schedule will be arranged and one team will compete against only one other opponent in each semi-weekly competition. The semi-weekly winners will be determined by adding the totals of all four members of the team and matching the score against that of the opposing team. The team having the best won and lost record at the close of the contest will be declared winner. In case of a tie, the team with the highest scoring average will receive the award. The same set of 10 reports will count as the contestant's individual score as well as his team score. Only *one set* of 10 reports can be submitted per semi-weekly competition, and no station may be reported more than once during the same semi-weekly period of competition.

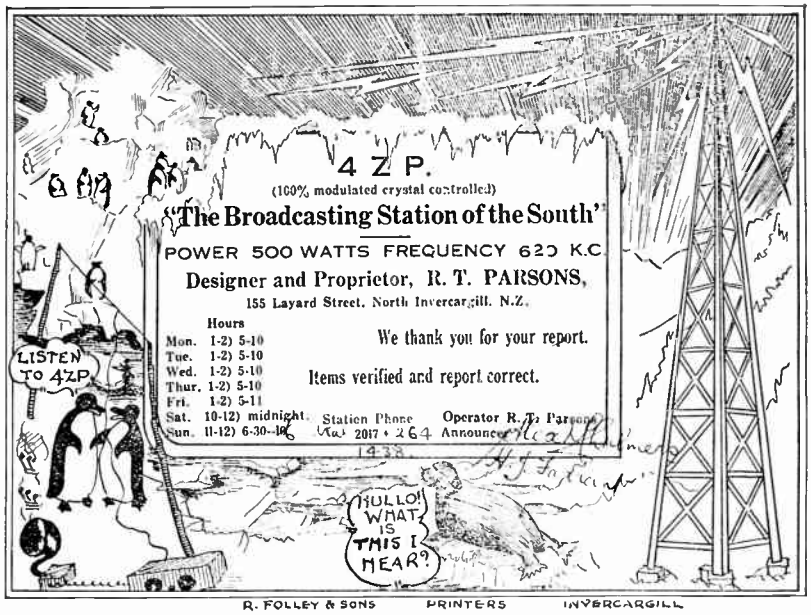
5. *Time*: The contest opens November 7, 1937 and will close at midnight, April 24, 1938. At the end of each week the contestant must prepare his 20 reports and have them in the mails not later than the following Tuesday at midnight local time.

6. *Judge*: Any controversies that may arise during the contest will be settled by the only judge in the contest, the Chief Night Owl—Ray La Rocque, whose decisions in all cases will be final.

7. *Awards*: These will be announced by AWR at a later date.

8. *Exceptions, Penalties,* and *Bonuses*: A person unable to compile 10 reports in one period of competition (Sunday through Wednesday, or Thursday through Saturday) may submit as many stations as possible. His score will then be divided by 10 just as though he had submitted his 10 reports, thus considerably decreasing his average.

A bonus to the extent of twice the actual points scored will be awarded for every report on a program listed in AWR's Time Table of DX Programs. As last year a penalty of twice the amount originally scored will be deducted for every report found to be incorrect after checking with the station.



Kia Ora, of New Zealand, sent us this 4ZP sample veri. Station slogan is "The Voice of Southland." Signature tune is "Back Again," by Jack Hylton's Orchestra

ALL-WAVE RADIO'S
Time Table of DX Programs
(All schedules given in Eastern Standard Time)

Specials

FRIDAY MORNING, OCT. 1

WTOC	Savannah, Ga.	1260 kc.	3:00-4:00

SUNDAY MORNING, OCT. 3

WJBO	Baton Rouge, La.	1120 kc.	2:00-4:00

THURSDAY MORNING, OCT. 14

WHIS	Bluefield, W. Va.	1410 kc.	2:30-3:30
WLLH	Lowell, Mass.	1370 kc.	1:45-2:00

SUNDAY MORNING, OCT. 24

WJBO	Baton Rouge, La.	1120 kc.	2:00-4:00

FRIDAY MORNING, OCT. 29

WLLH	Lowell, Mass.	1370 kc.	1:00-1:15

MONDAY MORNING, NOV. 1

WTOC	Savannah, Ga.	1260 kc.	3:00-4:00

Regulars

EVERY SATURDAY MORNING

KRLC	Lewiston, Idaho	1390 kc.	3:00-4:00

Watch for XED, Guadalajara, Mexico, on 1160 kc., from 1-3 a.m. Date not given, but will probably be either Saturday or Sunday mornings.

With the Night Owls

A department comprising excerpts of general interest from letters received from fellow Night Owls or from the broadcasters: *John R. Griggs,* Continuity Editor, XEMO, San Diego, Calif.: "New activity in this area now. 150 kw. transmitter is planned and now under construction at Rosarito Beach, Baja, California . . . about 16 miles south of Tiajuana. XELO is putting in a 50-kw. rig at Tiajuana. Both are expected to be on the air in about two months. Call letters for the Rosarito station not known as yet. XEAC is on 980 kc. now with about 1000 watts."

Clemente Serna Martinez, Agent—XET, Monterrey, Mexico: "We are glad to inform you that we are now broadcasting from 8 a. m., to 8 p. m., with 500 watts and from 8 p. m. on with a power of 5000 watts. Very soon we shall be transmitting on short waves."

Mario E. Bozzano, Station XED, Guadalajara, Mexico: "This station transmits on two frequencies simultaneously: XED and XEDQ broadcasting from noon to 4:30 p. m., and from 7 p. m. to midnight. Station XED transmits with a power of 2500 watts on 1160 kc."

Harry Snyder, Trenton, N. J.: "I wonder if it would not be possible for the contestants of last season's contest to form a small correspondence club. I'd like those interested to write to me at Rt. No. 53, P. O., Trenton, N. J."

Henry Guerrero, Station XEB, Mexico City, Mexico: "We fully authorize you to declare in any of your articles that we will answer all reports sent to us accompanied by an International Reply Coupon."

Clarence L. Poe, Memphis, Tenn.: "I have a report of a station change: The

call of station WNBR of this city has been changed to WMPS."

Kilocycling Around

Another confusing situation has arisen among the broadcasting stations of Cuba just as we were beginning to think that we had things fairly well straightened out. A few months ago the Cuban government released information regarding a few frequency changes in order to make use of the vacancy left on 850 kc. by the deletion of CMCN. One of these changes was a grant made to CMBC to change to 850 kc.—the change to take place as soon as they (CMBC) could secure the proper crystal to insure frequency stabilization. Several months have elapsed and a new station has made its appearance in Havana, utilizing 850 kc. The new station, CMCM, "La voz del 4 de septiembre", has a strong signal and surely must be using about 500 watts. We wonder now whether the occurrence of this new station cancels the CMBC grant and all the other grants relating to it, or—well, we wonder! And we'll just have to keep wondering till some definite word comes out of Cuba or till the stations themselves give us the inside information on what's what . . Make it your business, Night Owls, to get one of XEMO's new cards next season. Printed and handsomely decorated in bright green, the card will do justice to any DXer's collection . . . WPRP, "Radio Ponce," Ponce, Puerto Rico, now has some very distinctive veri cards ready for use and will soon release a DX schedule for next season. The 100-watt Puerto Rican has been reported ten times in New Zealand! . . XED, Guadalajara, Mexico, informs that they intend to conduct their first DX program in October from 1-3 a. m., but neglect to specify any date. Perhaps it's to be a daily feature—anyhow we suggest watching for them on 1160 kc.

CMHJ's popular DX announcer, Enrique Hidalgo, who walked away with second prize in the last AWR contest, has turned sports commentator. On the occasion of the National Junior Regatta, held in Cienfuegos Bay, Night Owl Hidalgo did a very creditable job of describing the event for the local CMHJ. Candid shot of broadcast appeared on contents page of September ALL-WAVE RADIO.

Cheers and Jeers

Three cheers to XET—"El Pregonero del Norte"—Monterrey, Mexico. This station, in the opinion of the Mexican people and the Mexican press, is the number one broadcaster outside of the capital city. XET's high reputation has been gained through its great supply of talent and its features of classical music and high quality dance programs. Being located in the border region of Mexico

(Continued on page 560)

ALL-WAVE RADIO'S DX FORECAST FOR OCTOBER

EASTERN NORTH AMERICA

General Forecast: *Static should be declining to a point where DX signals should be audible on favorable conditions. Latin Americans should be very good. Europeans may begin to break through near the end of the month in favorable localities. The stronger trans-pacific stations may begin to show up also in favorable localities.*

Call	*Forecast*
Rennes 1040 kc.	25th-31st, 1-1:30 a.m. R4. This station, the most consistent European, should be the first one heard. Their schedule does not begin till 2:00 a.m. which is too late to be heard at this point in the season, but occasionally a program test is conducted before commencing regular broadcasting.
Radio Normandie 1113 kc.	25th-31st, 1-1:30 a.m. R4. Nearly as consistent as Rennes. See particulars regarding Rennes schedule which also affect Radio Normandie.
3YA 720 kc.	15th-30th, 4-6 a.m. R3. Only those in very favorable location for N. Z. reception need expect to hear anything from this part of the world so early in the season.
4YA 790 kc.	15th-30th, 4-6 a.m. R4. Same as above but a little easier to hear—just a little!
LR— ——	1st-31st 7-10 p.m. R8. The following Argentines can be heard best at this hour some of them even later: LR1 (1070), LR3 (950), LR4 (990), LR5 (830), LR6 (870), LS2 (1190) and perhaps LRA (750), a new one. All these, of course, are subject to interference from any powerful locals which may be nearby.
YV5RA 960 kc.	1st-31st, 7-10 p.m. R6. This one comes through when XEAW is weak (if there is such a time).
YV5RQ 882 kc.	1st-31st, 7-12 p.m. R6. A new Venezuelan which was heard occasionally last season. Interference will be from CMQ and CRCO.
HJ1ABR 1400 kc.	1st-31st, 7 p.m.-1 a.m. R7. This one can often be heard signing off just after the locals have signed—and less frequently coming through the locals. Slogan "Radio Philco" and relays HJ1ABP.
CMQ etc. 880 kc.	1st-31st, sunset till 1 a.m. R9. The strongest Latin American. Other Cubans which should be heard with varying strength till around midnight are CMX (920), CMBS (770), CMCF (815), CMBY (970), CMCJ (1110), CMCO (1200), CMBC (630?), CMCM (850).
XEW 890 kc.	1st-31st, 1-1:15 a.m. R8. Chimes very frequent. Slogan "Voice of Latin America." Heard earlier in evening but is best after locals sign off.
XE— ——	1st-31st, 12-2 a.m. R4-9. The powerful border broadcasters are heard consistently with R9 signals and can hardly be considered DX. Other than these, the following should be good DX targets in Mexico: XEP (1160), XEK (990), XEMO (860), XET (690), XEU (1010). All Mexicans broadcast late and many more may be picked up after midnight.
XEFO 940 kc.	1st-31st, 1-2 a.m. R9. Daily program in English for American listeners.
TGW 1210 kc.	3rd, 10th, 17th, 24th, 31st; 12-6 a.m. R7. Regular Sunday morning DX program for America.
TIPG 625 kc.	1st-31st, 7-12 p.m. R5. A good catch. Requires a selective receiver set and much patience.
HIX 800 kc.	1st-31st, 7-9 p.m. R6. Sometimes breaks through the locals, but is more often heard on DX programs. Watch timetable.
WKAQ 1240 kc.	1st-31st, 7-8 p.m. R7. Can be heard just around sunset before locals get too strong.

WESTERN NORTH AMERICA

General Forecast: *The season for trans-Pacifics is just beginning. Good reception may be experienced from the more powerful broadcasters. Latin Americans are not so easily heard as in the east—with the exception of Mexicans. European reception nil on west coast in October.*

Call	*Forecast*
?YA ——	1st-31st, 3-7 a.m. R6. The following New Zealanders should be heard varying in strength according to the following order. Strongest listed first: 4YA (790), 3YA (720), 1YA (650), and 2YA (570).
Austl. ——	1st-31st, 3-7 a.m. R6. Following is a list of stations in Australia which should be heard well in October. 4QN (600), 5CK (640), 2CO (670), 2NR (700), 7NT (710), 2BL (740), 3LO (770), 3GI (830), 4BC (1120), 4AK (1220).
CMQ 880 kc.	1st-31st, 11 p.m.-1 a.m. R8. Should be heard often, especially during last hour.
CM— ——	1st-31st, 10-12 p.m. (or later) R5-7. Cubans are hard to hear on west coast. Only the following may be depended upon: CMX (920), and CMCF (815).
XE— ——	1st-31st, sunset till 2 a.m. or later. R7-9. Mexicans very easily heard in the west All those listed in Eastern list plus XEAC (980), XEOK (760), and XEAO (660).
TGW	Same as East forecast.
1210 kc.	Same as East forecast but with
LR— ——	a little decrease in maximum signal.

Channel Echoes

By ZEH BOUCK

RADIODIFEROUS . . . THE FCC AND NOISE . . . A DECLINE IN BROWN BOMBING . . .

THE stench from these radiodors is becoming so bad that they demand an immediate airing—so we'll start out with them. John E. Owens, of Tacoma, Washington, while he doesn't rate the free subscription for the radiodor of the month, nominates the news broadcasts— or perhaps bullet-ins is the better word—on the Sino-Jap situation over JZK and JZJ. According to Japan —as Owens reports it—the entire Mongolian race has been made over into chopsuey without so much as a Japanese casualty. Owens sends us his personal QSL card with the background pretty well plastered with other QSLs—and AWR.

W. A. Darr, Jr., of Kansas City, Mo., comes through with the following: "How did you like Clem McCarthy's cute talk with Edwin C. Hill on all we owe to Buick between rounds of the Braddock-Louis fight? That ought to get the radiodor corsage of onions!" (We expect to get around to Clem McCarthy a little later on.—Z. B.)

Continues radio stench sleuth Darr: "My nomination for the prize of the month goes to WDAF, Kansas City. After spending five minutes before the fight telling how good WDAF was to bring us the fracas, and how the commercial programs would be on afterwards, the brilliant control man at WDAF, when the NBC boys announced that Louis was returning to his dressing room, cut the network off and gave us Easy Aces. Then they switched us back to Braddock's room and when the NBC lads started for Louis's room, they put on another transcribed 'feature,' 'Musical Moments.' I ask you, doesn't that rate the spray of garlic?"

Samuel Brodsky, RSSL Station W4H22, of New York City, nominates the Gang Busters program, sponsored by Palmolive. We agree with him that they don't come much worse—but we copped the prize on that as our own nomination some months back.

Another RSSLer—W16S4, of Houston, Texas, dislikes the odor of KPRC for throwing in plugs any old place whatsoever, regardless of chimes or regulation station announcements.

However, the radiodor of the month is submitted by Anthony C. Tarr, of Seattle, Washington,—and to him goes the free subscription. It is typical of the stench that infests the commercial air channels.

"I am writing concerning the baseball broadcasts sponsored by General Mills, Inc., makers of 'Wheaties.' This refers to the Pacific Coast in general and to station KIRO in Seattle in particular. The way they insert their advertising plugs into the game is absolutely revolting. Scarcely a play goes by without the listeners being reminded of how closely it ties up with Wheaties. For instance—

"'He missed the ball! Well you'll be missing something too if you don't have Wheaties for breakfast tomorrow morning.—It's a double play, just like Wheaties. They're a double play every time. They taste good and they're good for you!—He's arguing with the umpire, and from the language he's using, I don't think he is asking him to join him in a bowl of Wheaties.—He picked off that fly ball as easily as picking Wheaties off your grocer's shelf.—Judging by the rally they're putting on, the coach must have fed the boys Wheaties between innings.—He didn't get a hit with four times at bat. Guess he didn't have Wheaties for breakfast this morning!'

"We simply can't enjoy the broadcast because we're all jittery waiting for the next plug to be slipped in. Advertising between the innings isn't so bad—and Lord knows we get enough of that—but not after each play. Besides that, they endeavor to give one the impression that all the best players owe their success to eating Wheaties regularly—'with plenty of milk or cream, sugar, and some kind of fruit'!"

✦

OUR PERSONAL RECOMMENDATION as radiodor would be that classic favorite One Man's Family—because of the poor grammar which Carlton Morse writes into the script. That Ann should get her nominatives and objectives mixed up is understandable. Anybody who could write such an atrocious song as "Love in My Heart" (or whatever the name is) could hardly be expected to do much better with the Queen's English. And Clifford Barber, who is stupid enough to fall in love with her, necessarily finds himself in the same category. However, why Claudia (unless it's because she's Clifford's twin) should say "Is it the sun or is it me?" is beyond us—and certainly there is no excuse for Paul, the author and intelligentsia of the Barber tribe, pulling the awful solecisms he does. Either the radio audience is being talked down to—or the inclusion is accidental. If the former, it is a sorry prostitution of the subtle educational possibilities of radio broadcasting—if the latter it is a sad commentary on the quality of those who prepare our radio scripts, who rehearse them, who censor them, who direct them and who speak the lines.

Which reminds us that Carlton Morse has himself in a jam in reference to this mysterious infant David whom Paul's inamorata, the Spencer Gal, brought

(Continued on page 559)

The Mystery Listener . . . who is he? . . . what's the story behind the photo? . . . we don't know.

RADIO SIGNAL SURVEY LEAGUE NEWS

THE R. S. S. L. membership is increasing at a good rate, so we should be able to look forward to a greater and more extensive activity this season. Some areas are still weak in membership, but this situation is rapidly taking care of itself.

Foreign enrollments are also on the increase, with England well out in front. Our English members have enthusiasm and initiative to spare, and we venture to say that they will prove themselves to be indispensable in League activities.

Mr. Arthur A. Uppington, Station G20, of Bristol, England, sent us a typical British listener's signal report card, which we are reproducing here. It is standard for members of the Bristol Listeners Club, of which Mr. Uppington is Honorary Secretary.

NEW R.S.S.L. MEMBERS

CALIFORNIA
Marquis A. Herrell, Beverly Hills—W29M24
Pat Crichton, Carmel—W31K2
Jettie B. Hill, Jr., Eureka—W31G1
Frank A. Law, Loomis—W30J5
Melvin James Dilbeck, Pasadena—W29M23

CANADA
Dudley W. Meakin, Vancouver, B. C.—VE29A5
John R. Todd, Peterborough, Ontario—VE6F2
Alvin Bergwest, Sudbury, Ontario—VE8D2
Henry Seymour Davies, Sudbury, Ontario—VE8D1

COLORADO
Karl F. Rayburn, Steamboat Springs—W22J1

CONNECTICUT
Edward Revell, Bethel—W4G19
Edward F. Reed, Noank—W3G25

ENGLAND
Richard Booth, Accrington, Lancashire—G22
Norman Moorcroft, Bolton, Lancashire—G23
George Walker, Bradford, Yorkshire—G16
Arthur A. Uppington, Bristol, 2.—G20
Conrad George Tilly, Bristol, 6.—G12
Dan Mason Gledhill, Devon—G5
William James Colclough, Ealing, London W13—G7
Henry Alfred Major, London—G19
Eric Penrose, London—G4
George Hare, Leadenham, Lincolnshire—G13
Albert E. Rose, Long Eaton, Notts—G11
John Rosevere Hodgkyns, London—G17
Charles Leslie Towers, Morpeth, Northumberland—G9
Claude George Jones, Portsmouth, Hants—G21
Geoffrey Roland Diaper, Sudbury, Suffolk—G10
Leslie Wilfred Orton, Uxbridge—G15
Eileen Gething Harris, Uxbridge—G14
Joseph Stephen Gingell, Village, Derbyshire G6
Frank Whitfield, Widnes, Lancashire—G18

FLORIDA
James Young, Tampa—W7T2

ICELAND
Arni Sigurdsson, Reykjavik.—TF1

IDAHO
Alton J. Daley, Lewiston.—W26C5
R. Baker Young, Parma—W27F1

ILLINOIS
Robert C. Huber, Belleville—W13L8
Frank Anzalone, Chicago—W11J4
R. G. Behrens, Chicago—W11H39
Edward Kulwitz, Chicago—W11H42
Bernard John Ponatoski, Chicago—W11H40
Edwin Prond, Chicago—W11H43
Luther Schnake, Des Plaines—W11H41
Cyrus B. Mill, Kenilworth—W12H5
Frank Meier Stevenson, Vandalia—W12K3
Robert L. Stevenson, Vandalia—W12K4

INDIANA
Jack S. Campbell, Covington—W11J6
Zane E. Sprague, Covington—W11H5

IOWA
Bertram Boss, Jr., Marcus—W16H1

MARYLAND
Louis Frenkel, Jr., Baltimore—W5J14
Howard Keilholtz, Baltimore—W5J13
Homer B. Peacock, Cumberland—W6J3

MASSACHUSETTS
Edward Lendzioszek, East Hampton—W4F12
Albion Saville, East Hampton—W3F54.

MICHIGAN
Chairles Guada, Grosse Point Park—W9G15
Eugene L. Beebee, Jackson—W10H6
John L. Millard, Jackson—W10H7
Ellis J. Bird, Kalamazoo—W10H5

MINNESOTA
Frank Sterle, Jr., Wilpen—W14D1

MISSOURI
Charles Perry Towson, Boonville—W14K2

MISSISSIPPI
Lunceford Pierce Gillentine, Jr., Lake Cormorant—W12N2.

NEVADA
Jack Scott, Carson City—W29J2

NEW JERSEY
Theophilis Alpheaus Nickles, Elizabeth—W4H136
Frank H. Koble, Garfield—W4H138
James Walter Stevenson, Jr., Hackensack—W4H134
Robert Eldrege, Jr., Irvington—W4H139.
Klaus Schmidt, Kenilworth—W4H137
Joseph B. Cristoph, Maplewood—W4H133.
Joseph Fucetola, Jr., Newark—W4H135.

NEW YORK
Robert R. Cammann, Baldwin—W4H132
Herbert S. Handler, Baldwin—W4H128
Lionel Feldheim, Howard Beach—W4H131.
Edward Frederick Shirley, Jamestown—W7G10
Frank H. Brenneman, Rochester—W6F3
Harold Irving Tucker, West Point—W4G20
Hugh W. Caulkins, New York City—W4H129

OHIO
Vernon Medill, Cincinnati—W10K12
William A. Oker, Cincinnati—W10K9
George Schwartz, Cincinnati—W10K10
John Schwartz, Cincinnati—W10K11
Philip C. Underwood, Cincinnati—W10K13
John J. Dezina, Cleveland—W8H24

OREGON
Don Smith, Jr., Salem—W3E7
Ralph Smith, Salem—W30D4
Bill King, Silverton—W30D3

PENNSYLVANIA
William K. McAleer, Bellevue, Pittsburgh—W7J16
George C. Starry, Derry—W7112
Stanley Brus, No. Braddock—W7J14
Frank J. Schramever, Philadephia, W4H130
Paul Stoehr, Pittsburgh—W7J13
Leo B. Madden, Jr., Pittsburgh—W7J15

SCOTLAND
Walter Abbey Anderson, Selkirk—G8

SOUTH CAROLINA
John L. Anderson, Charleston—W6P1
T. A. Able, Jr., Abbeville—W8N3
Leonard Moore, Greenville—W8N2

SWEDEN
Ingvar Gullberg, Hedemora, Dalecarlia—SM1

TENNESSEE
Newton T. Hammet, Memphis—W12N1.

VERMONT
Robert E. DeCelle, St. Albans—W4E10

VIRGINIA
Wm. E. Sampson, Jr., Richmond—W5K2
Harold Tear, Roanoke—W7L2

WEST VIRGINIA
Millard Fortner, Ceredo—W8K2
Virda L. Hiles, Nellis—W8K1.

WISCONSIN
Philip John Sharrow, Columbus—W12G9.
Adin Randall, Jr., Eau Claire—W15F2
Charles Peter Ackermann, Milwaukee—W12G11
Jerry E. Behagen, Milwaukee—W12G8
Ralph Harold Liedtke, Milwaugee—W12G12
J. W. Senecal, Wauwatosa—W12G10

Intercommunication

League activities have spread so far afield that it has become necessary to consider the problem of proper contact between members and headquarters. The situation can be handled locally through the medium of ALL-WAVE RADIO and our Sectional Managers, but proper contact with foreign members has not been established. For the present we are sending survey notifications to foreign Sectional Managers through the mails, but even this is a slow method.

The Directors have considered the problem, and have come to the conclusion that present methods of notification should be supplemented *both locally and abroad* by communication via amateur radio in all instances where government regulations permit. This method of communication both to and from headquarters, and maintained in all parts of the world, would do much toward improving and simplifying survey activities.

The Board of Directors has drawn up a set of proposals for submission to members for their approval. The Communication Plan will be put into effect if the majority opinion is in its favor. Read the following proposals and state your opinion on a postcard, together with any suggestions you may have bearing on the plan.

(1) It is proposed that the R.S.S.L. enlist the services of a group of amateur radio stations, widely separated geographically, for the transmission by c.w. and/or phone, signal survey data and other League notifications, said transmissions to be directed to predetermined amateur receiving points to conform with the regulations of the Federal Communications Commission.

(2) That the locations of said amateur stations, the transmission frequencies employed, and the time schedules selected shall be such that all parts of the world may be reached.

(3) That such stations enlisted shall be officially recognized by the League, and the calls of these stations, their operating frequencies, and their fixed schedules be published in ALL-WAVE RADIO each month for the convenience of R.S.S.L. members.

(4) That each R.S.S.L. member, or a group in one locality, attempt to enlist the services of a local amateur to (a) handle member traffic directed to headquarters

(b) to function as a League network station for both direct and relay traffic, and (c) to maintain schedules with foreign amateur radio stations regularly handling League traffic between foreign members and headquarters.

(5) That the calls, type of emission, operating frequencies, and working schedules of such network stations be published in ALL-WAVE RADIO, and copies of such lists sent to each amateur in the network.

(6) That a standardized and abbreviated form of signal report be devised for use when such data is sent to headquarters via amateur radio.

(7) That League members discuss the Communications Plan with amateurs in their locality with the purpose of determining their opinions of the proposal and their willingness to offer their services.

(8) That League members who are licensed amateurs discuss the proposal with other amateurs with the thought in mind of developing a satisfactory communication network.

A typical British S.W.L. card—in British colors.

Official Survey No. 3

The opening signal survey for this season is to be conducted for the Special Emergency Station WANC, of Ira Lou Spring Post No. 149 of the American Legion, at Jamestown, N. Y. The request was made by Fred P. Rogers, Post Mobilization Officer, and Chief of the Emergency Unit.

WANC is the only Emergency Station owned by a private disaster relief organization. The equipment is installed in a house trailer and a gasoline-driven a.c. generator supplies emergency power. Transmitter power is low—12.5 watts phone and 50 watts c.w.—and for this reason it is desirable to determine what areas can be effectively covered.

During the recent flood, WANC, together with men, supplies and equipment, was sent to North Vernon, Indiana, where it did service at Headquarters of the 76th Brigade Indiana National Guard.

WANC will conduct transmission tests each Monday night from 8 to 10 p.m., eastern standard time, on a frequency of 2726 kilocycles. Phone will be used. Reports from all R. S. S. L. members will be appreciated, but reports from the eastern states will be of particular value. The transmission tests will continue indefinitely, but members are requested to send reports to their Sectional Managers as soon as they are reasonably complete.

Australian BCB Survey

A survey is to be conducted next month on the signals from station 2NZ, Inverell, N.S.W., Australia. The test program will run from 4 to 5 a.m., eastern standard time. The frequency of the station is 1170 kc. and its power 2 kw.

It is an early hour for most members in the U. S. but separate reports sent direct to the station and coinciding with the program log will be verified. These reports should be addressed to Station 2NZ, P.O. Box 3, Inverell, N.S.W., Australia. Send your standard reports along to your Sectional Manager so that he can forward them to headquarters for field pattern analysis.

Station Interference Surveys

Members are requested to continue reporting on cases of station interference in the short-wave broadcast bands. These reports should be forwarded to the Sectional Managers. The League intends doing everything in its power to induce stations to alter frequency or cooperate on time schedules when cases of actual interference have been fully substantiated. So do your part in helping to clear these channels of QRM.

Include in your report the calls of the stations in interference with each other, their advertised frequencies, the time the interference was noted, and the extent of the interference.

Noise Surveys

The League has laid a preliminary groundwork for attacking the subject of electrical interference to radio reception. However, this is a problem of international interest and has been given consideration by committees formed for the purpose of studying the situation from its various angles. It will be given an airing at the coming Cairo Conference, and until the reports of this Conference are made available, no definite program of attack can be formulated.

Nevertheless the prevailing opinion both here and abroad is that the problem of interference to radio reception must be approached from the point of view that the public as a whole may be served in the most efficient manner by cooperation among the various industries. It is felt that legislation should be deferred for the present.

As pointed out by the Federal Communications Commission, conditions vary so widely in different parts of the United States as to available signal strength, character of electrical services, including their proximity to radio receivers, as to make it impracticable to lay down hard and fast rules as to the signal strength to be protected or the noise levels to be tolerated.

Little can be done about noise interference from household electrical equipment unless the owner is willing to cooperate to the extent of purchasing a filter, or giving his permission to someone else to have a filter installed on the offending appliance.

Interference from power lines, street railways and industrial equipment is a different matter. If noise is traced to such sources, the company or companies owning the equipment will usually lend their cooperation in eliminating the trouble. But it is necessary first to establish the source of the noise. Proof is required before any representations can be made.

If there is a high noise level in your own location, it is best to determine first if the noise covers a considerable area. If it is restricted to your own immediate vicinity, its source is more than likely an oil burner, faulty house wiring, a loose contact in a light socket, or an electrical appliance such as a vacuum cleaner if the noise appears only at intervals. In such cases you have your own house or a neighbor to deal with.

Methods of eliminating such interference are covered in an article appearing elsewhere in this issue.

If you are reasonably assured, however, that the noise originates in a power

(Continued on page 545)

FOREIGN BROADCAST STATIONS

LIST OF FOREIGN STATIONS OPERATING IN THE U. S. BROADCAST BAND

THE stations in the accompanying list are grouped in channels of 10 kilocycles separation for the convenience of listeners accustomed to the U. S. system of station frequency allocation. Some countries have stations operating on odd or split frequencies. To find the exact frequency of these stations simply add the number in parentheses following the location to the frequency shown above it. Thus, at the beginning of the list, under 510 kc., the frequency of the station at Hamar, Austria, is 519 kc.

Canadian, Mexican, Cuban, and other nearby stations, have their location printed in capital letters for the sake of ease in picking them out of the list.

The numerals to the right of each station indicate the power of the station in watts.

510 KC		
—	Hamar, Austria(9)	700
—	Insbruck, Austria(9)	1000
—	Tartu, Estonia(7)	500
520 KC		
—	Ljubljna, Yugoslavia(7)	5000
—	Vipuri, Finland(7)	—
RW34	Stalingrad, U.S.S.R.(2)	10000
530 KC		
—	Wilno, Poland(6)	50000
I-1BZ	Bolzano, Italy(6)	10000
540 KC		
CJRM	MOOSE JAW, SASK.	1000
HAL	Budapest, Hungary(6)	120000
550 KC		
—	Beremunster, Switz.(6)	100000
CFNB	FREDERICKTON, N. B.	500
RW52	Tchita, U.S.S.R.(6)	20000
XEFC	MERIDA, MEXICO	100
2CR	Cummock, Australia	10000
560 KC		
—	Athlone, Irish F. S.(5)	100000
—	Klapeida, Lithuania(5)	10000
CMCK	HAVANA, CUBA	—
I-1PA	Palermo, Italy	4000
MTCY	Shinkyo, Manchuokuo	100000
RW41	Syktyvkar, U.S.S.R.(3)	1200
RW42	Gorki, U.S.S.R.(5)	10000
XEAO	MEXICALI, MEXICO	250
XLHB	Shanghai, China	45
ZUG	Grahamstown, U. of So. Af.	10000
570 KC		
—	Magnitogorsk, U.S.S.R.(1)	10000
—	Stuttgart, Germany(4)	100000
CB57	Santiago, Chile	5000
CX-2	Montevideo, Uruguay	—
RW68	Tcheliabinsk, U.S.S.R.(7)	1500
T15CV	San Jose, Costa Rica	100
2YA	Wellington, N. Zealand	60000
6WA	Minding, Austl.	10000
580 KC		
—	Alps-Grenohle, Fr.(3)	60000
CC58	Temuco, Chile	500
CFPR	PRINCE RUPERT, B. C.	50
CHRC	QUEBEC, P. Q.	100
CKCL	TORONTO, ONTARIO	100
CKUA	EDMONTON, ALBERTA	500
JFCK	Taichu, Formosa	1000
PRB5	Franca, Brazil	50
PRC3	Pelotas, Brazil	250
PRD6	Piracecaba, Brazil	—
PRG6	Cruzeiro, Brazil	250
PRP7	Campos, Brazil	250
RW36	Archangel, U.S.S.R.(6)	10000
XQHA	Shanghai, China	250
YLZ	Riga, Latvia(3)	15000
3WV	Horsham, Australia	10000
590 KC		
—	Vienna-Bisamburg, Aus.(3)	100000
JOAK-1	Tokyo, Japan	150000
LS-10	Buenos Aires, Argentina	6000
XHKB	Tongchow, China	100
7ZL	Hobart, Australia	1000
600 KC		
CFCF	MONTREAL, P. Q.	400
CJOR	VANCOUVER, B. C.	500
CMW	HAVANA, CUBA	1400
CNR	Rabat, Morocco(1)	2500
CRCW	WINDSOR, ONTARIO	500
FJP	Noumea, New Caledonia	500
FQN	ST. PIERRE & MIQ. IS.	250
JONG	Miyazaki, Japan	500
PRH2	Porto Alegre, Brazil	25000
RW82	Frounze, U.S.S.R.(8)	2500
SBD	Sundsvall, Sweden(1)	10000
TIFA	San Jose, Costa Rica	250
XMHA	Shanghai, China	1000
ZTC	Cape Town, U. of So. Af.	10000
4QN	Clevedon, Australia	7000
610 KC		
CX-4	Montevideo, Uruguay	1000
I-1FI	Firenze, Italy	20000
JOJK	Kanazawa, Japan	3000
RW18	Pratigorsk, U.S.S.R.	10000
RW22	Oufa, U.S.S.R.(7)	10000
RW50	Oust-Abakansk, U.S.S.R.(7)	2500
RW79	Mourmansk, U.S.S.R.	10000
XEXM	MEXICO CITY, MEX.	1000
XEYO	MEXICO CITY, MEX.	500
XGSS	Tsunshi, China	15
2FC	Sydney, Australia	3500
620 KC		
—	Brussels, Belgium	1500
—	Cairo, Egypt	20000
—	Trondelag, Norway(9)	20000
CB62	Santiago, Chile	1000
CT1AA	Lisbon, Portugal(9)	20000
LKK	Kristianssand, Norway	20000
LV3	Cordoba, Argentina	2000
RW31	Ivanovo, U.S.S.R.	10000
TIPG	San Jose, Costa Rica(5)	1000
XHHK	Shanghai, China	100
4ZP	Invercargill, N. Z.	450
630 KC		
CA63	Iquiqua, Chile	250
CFCO	CHATHAM, ONTARIO	100
CFCY	CHARLOTTET'N, P.E.I.	1000
CJRC	WINNIPEG, MAN.	500
CKOV	KELOWNA, B. C.	100
JOKK	Okayama, Japan	500
LS3	Buenos Aires, Argentina	5000
OKP	Praha, Czechoslovakia	120000
RW28	Vladivostok, U.S.S.R.(5)	1200
RW32	Vladivostok, U.S.S.R.(5)	10000
RW84	Oust-Abansk, U.S.S.R.(5)	1200
XEZ	MERIDA, MEXICO	500
YNPR	Managua, Nicaragua	—
3AR	Melbourne, Australia	4500
640 KC		
—	Shanghai, China	100
—	Lyons, France(8)	90000
CB64	Vina del Mar, Chile	1000
CC64	Concepcion, Chile	1000
CMK	HAVANA, CUBA	3000
JODG	Hamamatsu, Japan	500
LU-12	Rio Gallegos, Arg.	1000
LV-12	Tucuman, Argentina	2500
RW29	Petrozavodsk, U.S.S.R.(8)	10000
RW56	Penza, U.S.S.R.	1200
XEBX	SABINAS, MEXICO	250
ZTJ	Johannesburg, So. Af.(5)	10000
5CK	Crystal Brook, Austl.	7500
650 KC		
—	Cologne, Germany(8)	100000
CX-6	Montevideo, Uruguay	50000
JOUK	Akita, Japan	300
TIGP	San Jose, Costa Rica	1000
1-YA	Auckland, New Zealand	10000
660 KC		
—	Jerusalem, Palestine(9)	20000
—	Moorside Edge, Gr. Brit (8)	70000
RW38	Alexandrovsk, U.S.S.R (2)	2000
XEAL	MEXICO CITY, MEXICO	1000
XGOA	Nanking, China	75000
2DU	Dubbo, Austl.	100
670 KC		
—	Sottens, Switzerland(7)	100000
JOTK	Matsue, Japan	500
LS4	Buenos Aires, Argentina	7000
MTFY	Harbin, Manchuokuo	3000
PRA7	Ribeirao Preto, Brazil	—
PRE6	Nictheroy, Brazil	1500
PRG5	Santos, Brazil	750
RW23	Groznyl, U.S.S.R.(6)	1000
VOWR	S. JOHNS, NFLD.(5)	500
2CO	Corowa, Australia	1000
680 KC		
—	Belgrade, Yugoslavia(6)	2000
—	Salisbury, So. Rhodesia(1)	1500
CB68	Valparaiso, Chile	1000
CMCG	HAVANA, CUBA	1000
CW27	Salto, Uruguay	250
HJN	Bogota, Colombia	1000
JOVK	Hakodate, Japan	500
LU4	Comodoro Rivadavia, Arg.	500
RDN	San Salvador, Salvador	500
RW17	Kazan, U.S.S.R.(6)	10000
RW27	Makhatch, U.S.S.R.(9)	4000
RW46	Karaganda, U.S.S.R.(6)	1200
RW71	Petropavlovsk, U.S.S.R.(9)	1200
RW74	Tcheboksary, U.S.S.R.	1200
VAS	GLACE BAY, N. S.	2000
690 KC		
CFRB	Paris FPTT, France(5)	120000
—	TORONTO, ONTARIO	10000
CJCJ	CALGARY, ALBERTA	100
CX-8	Montevideo, Uruguay	500
JOBK-1	Osaka, Japan	10000
LV6	Mendoza, Argentina	500
PRA6	Sao Paulo, Brazil	5000
TI4WX	San Jose, Costa Rica	250
XET	MONTERREY, MEX.	500
6WF	Perth, Australia	3500
700 KC		
—	Malmberget, Sweden(4)	200
JOCG	Asahigawa, Japan	308
RW48	Elista, U.S.S.R.(4)	500
SBA	Stockholm, Sweden	55000
VPB	Colombo, Ceylon	1750
XMHC	Shanghai, China	500
ZP15	Villarica, Paraguay	1000
2NR	Lawrence, Australia	7000
710 KC		
I-1RO	Rome, Italy(3)	120000
JODK-1	Keijo, Korea	10000
LS-1	Buenos Aires, Argentina	5000
RW16	Samara, U.S.S.R.	10000
XGML	Kashing, China(4)	7.5
XGOS	Chunking, China(1)	1000
720 KC		
JORK	Kochi, Japan	500
JFBK	Tainan, Formosa	1000
LKB	Bergen, Norway	1000
LKF	Frederikstad, Norway	1000
PRA3	Rio de Janeiro, Brazil	1500
RW9	Kiev, U.S.S.R.(2)	36000
XEH	MONTERREY, MEX.	100
XEN	MEXICO CITY, MEX.	1000
XLHC	Shanghai, China	50
XLHD	Shanghai, China	50
3YA	Christchurch, N. Z.	10000
6GF	Kalgoorlie, Austl.	2000
730 KC		
—	Assiut, Egypt(1)	100
—	Tallinn, Estonia(1)	50000
CB73	Santiago, Chile	1000
CFPL	LONDON, ONTARIO	100
CJCA	EDMONTON, ALTA.	1000
CKAC	MONTREAL, P. Q.	5000
CKPR	FORT WILLIAMS, ONT.	100
CX10	Montevideo, Uruguay	1000
EAJ2	Madrid, Spain(1)	3000
EAJ5	Seville, Spain(1)	5500
JOCK-1	Nagoya, Japan	10000
LV1	San Juan, Argentina	1000
RW65	Saransk, U.S.S.R.(4)	1000
TIGH	San Jose, Costa Rica	1000
XEPN	PIEDRAS NEGRAS, MX.	50000
XHGS	Wuchow, China	50
5CL	Adelaide, Australia	2000
740 KC		
—	Marseilles, France(9)	100000
—	Munich, Germany	100000
—	Pori, Finland(9)	1000
—	Sortavala, Finland(9)	200
JOSK	Kokura, Japan	1000
RW64	Ordjonikidze, U.S.S.R.	10000
XHHB	Shanghai, China	50
2BL	Sydney, Australia	3000
750 KC		
—	Katowice, Poland(8)	12000

570	CMCY	Havana, Cuba
600	CMQ	" "
625	TIPG	San Jose, C. R.
630	CMCD	Havana, Cuba
638	YSS	Salvador
650	TIX	San Jose, C. R.
680	CMCG	Havana, Cuba
690	XET	Monterrey, Mex.
730	CMCL	Havana, Cuba
740	....	Brazil
755	CMBL	Havana, Cuba
760	CMHX	Cienfugos, Cuba
770	CMBF (3)	Havana, Cuba
776	TILJ	San Jose, C. R.
810	CMCF	Havana, Cuba
820	XEBG	Tiajuana, Mex.
830	LR-5	Buenos Aires, Arg.
850	CMCM	Havana, Cuba
854	OAX4A	Lima, Peru
860	XEMO	Tiajuana, Mex.
870	LR-6	Buenos Aires, Arg.
880	CMW	Havana, Cuba
880	PRI3	
882	YV5RQ	Caracas, Venez.
920	CMX	Havana, Cuba
950	LR-3	Buenos Aires, Arg.
955	CMBC	Havana, Cuba
960	YV5RC	Caracas, Venez.
970	CMBY	Havana, Cuba
980	XEAC	Tiajuana, Mex.
990	LR-4	Buenos, Aires, Arg.
990	XFK	Mexico City, Mex.
990	XEAF	Nogales, Mex.
1000	CMBZ	Havana, Cuba
1005	HJ3ABH	Bogota, Colombia
1020	XEJ	Juarez, Mex.
1030	CMCK	Havana, Cuba
1060	PRD2	
1070	CMBX	Havana, Cuba
1070	LR-1	Buenos Aires, Arg.
1080	PRI4	Jaoa Pessoa, Braz.
1100	CMCJ	Havana, Cuba
1100	XEL	Loon, Mex.
1105	HJ3ABD	Bogota, Colombia.
1122	YV1RF	Maracaibo, Venez.
1125	XEJ	Mex. City, Mexico
1135	CMKG	Santiago, Cuba
1143	CMCU	Havana, Cuba
1150	XEC	Tiajuana, Mex.
1153	YV1RE	Maracaibo, Venez.
1160	XEP	Juarez, Mex.
1170	CMBD	Havana, Cuba
1183	PRE3	
1190	LS-2	Buenos Aires, Arg.
1190	CMKX	Santiago, Cuba
1198	YV5RB	,Venez.
1200	CMCO	Havana, Cuba
1220	HJ3ABE	Bogota, Colombia
1220	PRA9	Rio de Jan. Braz.
1230	CMCB	Havana, Cuba
1260	CMC	Havana, Cuba
1280	XEMX	Mexico City, Mex.
1280	CMKO	Holquin, Cuba
1290	CMCU	Havana, Cuba
1305	TG-1	Guatemala City, G.
1340	CMJW	Camaguey, Cuba
1350	CMCA	Havana, Cuba
1370	XELZ	Mexico City, Mex.
1380	CMCR	Havana, Cuba
1410	CMCQ	Havana, Cuba
1420	CMCV	Havana, Cuba
1440	CMOA	Havana, Cuba
1430	TG-1-X	,Guat.
1520	TGW	Guatemala City, G.

—	Maritzburg, U. of So. Af.	10000
CMCW	HAVANA, CUBA	150
HS7PJ	Bangkok, Siam	10000
LRA	Buenos Aires, Argentina	10000
LUHO	T'ung Hsien, China	20
RW64	Urdjomikidze, U.S.S.R.(2)	10000
TIRM	San Jose, Costa Rica	15
XEAM	MATAMOROS, MEX.	25
XGOK	Canton, China	1000
XQKB	Tientsin, China	150
ZTD	Durban, U. of So. Af.	1500
7NT	Kelso, Australia	7000

760 KC

—	Burghead, Gr. Britain(7)	60000
—	Westerglen, Gr. Britain(7)	70000
CB76	Valparaiso, Chile	10000
CMHX	CIENFUEGOS, CUBA	200
JQAK	Dairen, Manchuokuo	1000
RW78	Ijevsk, U.S.S.R.(7)	——
XEOK	TIAJUANA, MEXICO	200
XLHI	Shanghai, China	7.5
XLHJ	Shanghai, China	100
2YB	New Plymouth, N. Z.	100

770 KC

—	Toulouse, France(6)	120000
CMBS	HAVANA, CUBA	150
CX12	Montevideo, Uruguay	1000
JOHK	Sendai, Japan	10000
RW26	Stalino, U.S.S.R.(6)	10000
TILI	San Jose, Costa Rica	450
VUM	Madras, India	200
XGOY	Kunming, China(6)	250
3LO	Melbourne, Australia	3500

780 KC

—	Leipzig, Germany(5)	120000
CB78	Santiago, Chile	1000
CHWK	CHILLIWACK, B. C.	100
CKSO	SUDBURY, ONTARIO	1000
CMJK	CAMAGUEY, CUBA	1000
JOPK	Shizuoka, Japan	500
LT-1	Rosario, Argentina	4000
PRD-2	Rio de Janeiro, Brazil	1000
XEL	MEXICO CITY, MEX.	1000
XLHA	Shanghai, China	50
YV1RX	Maracaibo, Venezuela	——

790 KC

—	Lwow, Poland(5)	50000
CMGH	MATANZAS, CUBA	250
EAJ-1	Barcelona, Spain(5)	7500
JOGK	Kumamoto, Japan	10000
LR-10	Buenos Aires, Argentina	10250
RW51	Naitchik, U.S.S.R.(4)	1000
XLIJ	Wusih, China	50
ZTB	Bloemfontaine, U. of So. Af.	10000
4YA	Dunedin, New Zealand	10000

800 KC

—	Penmon, Gr. Britain(4)	5000
—	Washford Cross, Gr.Brit.(4)	70000
HIX	CIUDAD TRUJILLO, D.R.	1000
JOKG	Kofu, Japan	500
PRG2	Sao Paulo, Brazil	10000
TIXD	San Jose, Costa Rica	100
XGOV	Chang-sha, China	10000
4QG	Brisbane, Australia	2500

810 KC

CMCF	HAVANA, CUBA	600
CX14	Montevideo, Uruguay	5000
I-1MI	Milan, Italy(3)	50000
JOIK	Sapporo, Japan	10000
VUC	Calcutta, India	2000
XEBZ	MEXICO CITY, MEX.	100
XEXC	AGUASCALIENTES, MEX.	350

820 KC

—	Bucharest, Roumania(3)	12000
CB82	Santiago, Chile	1000
CMHW	CIENFUEGOS, CUBA	100
CW23	Salto, Uruguay	250
JBBK-2	Heijo, Japan	500
LV7	Tucuman, Argentina	1000
PRH8	Rio de Janeiro, Brazil	1000
XEBG	TIAJUANA, MEXICO	1000
XLKB	Tientsin, China(5)	55
2ZH	Napier, N. Z.	90

830 KC

—	Reuil, France(2)	400
CMJX	CAMAGUEY, CUBA	500
JOFK	Hiroshima, Japan	30000
LR5	Buenos Aires, Arg.	33000
TIEP	San Jose, Costa Rica	3000
XGF	Tainan, China(3)	7.5
XGWH	Wu-hu, China	30
3GI	Longford, Australia	7000

840 KC

—	Berlin, Germany (1)	100000
CB84	Valparaiso, Chile	1000
CC84	Talcahuano, Chile	100
CFQC	SASKATOON, SASK.	1000
CRCT	TORONTO, ONTARIO	5000
F31-CD	Saigon, Fr. Indo-China	12000
LT8	Rosario, Argentina	500
PRB9	Sao Paulo, Brazil	5000
VOGY	ST. JOHNS, NFLD.(1)	100
XERA	VILLA ACUNA, MEX.	350000
XGTM	Chang-sha, China	15
XHHA	Shanghai, China	1000
ZBW	Hongkong, China	2000
2YC	Wellington, N. Z.	5000

850 KC

—	Sofia, Bulgaria	100000
—	Strasbourg PTT, Fr.(9)	35000
CMBC	HAVANA, CUBA	150
CMCM	HAVANA, CUBA	250
CX-16	Montevideo, Uruguay	10000
EAJ3	Valencia, Spain	3000
HI4V	TRUJILLO CITY, D.R.	25
HSPJ	Bangkok, Siam(6)	1500
JBCK	Seishin, Korea	10000
LKA	Aalesund, Norway	350
LKD	Bodo, Norway	10000
LKS	Stravangu, Norway	1000
LKP	Parsgrund, Norway	——
OAX4A	Lima, Peru	10000
RW73	Simferopal, U.S.S.R.(9)	10000
VQ7LO	Nairobi, Kenya(8)	600
VUB	Bombay, India(5)	2000
XLIQ	Hongchow, China	100
XQHB	Shanghai, China	100
5RM	Renmark, Australia	1000

860 KC

—	Pozan, Poland(8)	16000
—	Radio Agen, Paris	15000
HJ3ABC	Bogota, Colombia	25
PRA3	Rio de Janeiro, Brazil	2500
TIVL	San Jose, Costa Rica	30
XEMO	TIAJUANA, MEXICO	5000
XENC	MEXICO CITY, MEX.	50
XHHD	Shanghai, China	50
4AY	Ayr, Australia	100
7HO	Hobart, Australia	7000

870 KC

—	London, Gr. Britain(7)	50000
—	Tunis, Tunisia(7)	——
JOAK-2	Tokyo, Japan	150000
LR6	Buenos Aires, Argentina	26000
RW85	Igarka, U.S.S.R.(1)	2000
XEFB	MONTERREY, MEX.	200
XEJW	MEXICO CITY, MEX.	40
XLIL	Suchow, China	50
2GB	Sydney, Australia	1000

880 KC

—	Graz, Austria(6)	15000
—	Helsinki, Finland(4)	10000
CFIC	KAMLOOPS, B. C.	100
CMQ	HAVANA, CUBA	500
CRCO	OTTAWA, ONTARIO	1000
RW61	Iochar-Ola, U.S.S.R.(8)	1000
TILS	San Jose, Costa Rica	500
VUD	Delhi, India(2)	20000
XHHV	Shanghai, China	100
YV5RQ	Caracas, Venezuela(2)	——
1YX	Auckland, New Zealand	500
4DR	Perth, Australia	500
PRI 3	Bella Horizonte	22,500

890 KC

—	Limoges, France(5)	100000
CB89	Santiago, Chile	1000
CX-18	Montevideo, Uruguay	1000
JOLG	Tottari, Japan	500
MTBY	Hoten, Manchuokuo	1000
XEW	MEXICO CITY, MEX	50000
XGAK	Kashing, China(5)	15
XGOH	Chengtu, China	10000
ZP9	Asuncion, Paraguay (8)	1500

900 KC

—	Hamburg, Germany(4)	100000
CA9O	Tocopilla, Chile	100
CB90	Valparaiso, Chile	1000
CW29	Soriano, Uruguay	50
HC2ROZ	Guyaquil, Ecuador	100
HIG	TRUJILLO CITY, D. R.	50
KZIB	Manila, Philippine Is.	1000
LU2	Bahia Blanca, Argentina	2000
PRB7	Rio de Janeiro, Brazil	500
TI3TS	San Jose, Costa Rica	100
XGON	Nanking, China	200
XTGM	Tongchow, China	100
2LM	Linsmore, Australia	500
2ZP	Wairoa, New Zealand	210

910 KC

—	Radio-Toulouse, Fr.(3)	100000
CJAT	TRAIL, B. C.	1000
CKY	WINNIPEG, MAN.	15000
CRCM	MONTREAL, P. Q.	5000
JOLK	Fukuoka, Japan	500
LR2	Buenos Aires, Argentina	12000
RW30	Dnepropetrovsk, USSR.(3)	10000
XENT	NUEVO LAREDO, MEX.	50000
XLIM	Hanim, China	50
4RK	Rockhampton, Australia	2000

920 KC

—	Brno, Czechoslovakia(2)	32000
CMX	HAVANA, CUBA	1000
HHK	PT. AU PRINCE, HAITI	1000
JOQK	Nugata, Japan	500
TIRS	San Jose, Costa Rica	100
XEAA	MEXICALI, MEX.	200
XHHX	Shanghai, China	1000
ZJV	Suva, Fiji Islands	7500
2ZR	Nelson, New Zealand	60

930 KC

CB93	Santiago, Chile	2500
CFAC	CALGARY, ALBERTA	100
CFCH	NORTH BAY, ONT.	100
CFLC	PRESCOTT, ONT.	100
CHNS	HALIFAX, N. S.	1000
CKPC	BRANTFORD, ONT.	100
CX20	Montevideo, Uruguay	2000
HI-1J	SAN FRANCISCO, D. R.	40
JOAG	Nagasaki, Japan	500
ON4RB	Brussels, Belgium(2)	200
PRA8	Pernambuco, Brazil	5000
PRB2	Curityba, Brazil	250
PRC4	Amparo, Brazil	50
PRC7	Bello Horizonte, Brazil	250
RW55	Engelo, U.S.S.R.(2)	1000
VUG	Delhi, India(3)	1000
XEBH	HERMOSILLO, MEX.	500
3UZ	Melbourne, Australia	650

940 KC

—	Algiers, Algeria(1)	12000
JOBK-2	Osaka, Japan	10000
PRF4	Rio de Janeiro, Brazil	10000
SBB	Goteberg, Sweden(1)	10000
VOAS	ST. JOHNS, NFLD.	100
XEFO	MEXICO CITY, MEX.	5000
XENO	MEXICO CITY, MEX.	500
XGOF	Tsinan, China	500
XHHE	Shanghai, China	100
3ZR	Greymouth, N. Z.	250

950 KC

—	Breslau, Germany	100000
—	Poste Parisien, Fr.(9)	60000
CJOC	LETHBRIDGE, ALTA.	100
CMCD	HAVANA, CUBA	250
CRCS	CHICOUTIMI, P. Q.	100
JOOG	Oibihiro, Japan	500
LR3	Buenos Aires, Argentina	31000
RW40	Gomel, U.S.S.R.(9)	1000
RW54	Gomel, U.S.S.R.(9)	1000
TIRH	San Jose, Costa Rica	1800
XGOP	Peiping, China	300
YNVA	Managua, Nicaragua	30
ZTP	Pretoria, U. of So. Af.(2)	500
2UE	Sydney, Australia	1000

960 KC

—	Bordeaux, France(8)	3000
CB96	Coquimbo, Chile	——
CC96	Curico, Chile	100
CFRN	EDMONTON, ALTA.	100
CHNC	NEW CARLISLE, P. Q.	1000
LV2	Cordoba, Argentina	2000
OAX4E	Lima, Peru	200
PRF3	Sao Paulo, Brazil	5000
XEAW	REYNOSA, MEX.	50000
RW13	Odessa, U.S.S.R.(8)	10000
RW67	Oukhta, U.S.S.R.(9)	2000
RW69	Odessa, U.S.S.R.	10000
XHHE	Shanghai, China	100
YV5RA	Caracas, Venezuela	5000
2ZF	Palmerston N., N. Z.	250
5DN	Adelaide, Australia	300

970 KC

—	Belgast, Gr. Britain(7)	100000
CB97	Santiago, Chile	1000
CMBY	HAVANA, CUBA	150
CX22	Montevideo, Uruguay	250
JODK-2	Heijo, Korea	10000
LV9	Salta, Argentina	500
XHIB	Wusih, China	75
3BO	Bendigo, Australia	1000

980 KC

—	Torun, Poland	24000
CNO	Casablanca, Morocco(3)	25
I-1BO	Bologna, Italy(6)	50000
JOXK	Tokushima, Japan	500
PRC6	Rio de Janeiro, Brazil	1000
PRE8	Rio de Janeiro, Brazil	22000
TINRH	San Jose, Costa Rica	750
XEFE	NUEVO LAREDO, MEX.	20
XEAC	TIAJUANA, MEX.	1000
XMHB	Shanghai, China	500
2LV	Invernell, Australia	——
2ZJ	Gisborne, New Zealand	500
6AM	Northam, Australia	2000

990 KC

—	Hilversum, Holland	120000
JOCK-2	Nagaya, Japan	10000
LR4	Buenos Aires, Argentina	16000
XEAF	NOGALES, MEXICO	750
XEK	MEXICO CITY, MEX.	100
XES	TAMPICO, MEXICO	100
XGCK	Chaching, China	7.5
XGOD	Hangchow, China	2000
2GZ	Orange, Australia	2000
2YD	Wellington, N. Z.	250

1000 KC

CMBZ	HAVANA, CUBA	500
HI3ABH	Bogota, Colombia(5)	500
JOBG	Maebashi, Japan	500
OAX4-O	Lima, Peru	100
OKR	Bratislavia, Czech.(4)	13500
PRB6	Sao Paulo, Brazil	1000
PRE7	Sao Paulo, Brazil	5000
RW86	Tchernigov, U.S.S.R.(3)	5000
TIGPH	San Jose, Costa Rica	1300
VOCM	ST. JOHNS, NFLD.	50
VUU	Dekra Dun, India	300
XEBI	AGUASCALIENTES, MEX.	25
XEBK	NUEVO LAREDO, MEX.	100
XEXS	MEXICO CITY, MEX.	100
XGMK	Poatung, China	15
XGOT	Talyuan, China	50
3UL	Warregul, Vict.	100
4GR	Toowoomba, Australia	500
PRA9	Sao Paulo	20,000

1010 KC

—	Droitwich, Gr. Brit.(3)	70000
CB101	Santiago, Chile	1000
CHML	HAMILTON, ONT.	100
CHWC	REGINA, SASK.	500
CKCD	VANCOUVER, B. C.	100
CKCK	REGINA, SASK.	500
CKCO	OTTAWA, ONTARIO	100
CKIC	WOLFVILLE, N. S.	50
CKWX	VANCOUVER, B. C.	100
CMJA	CAMAGUEY, CUBA	300

CX24	Montevideo, Uruguay	2500
H14D	TRUJILLO CITY, D. R.	25
XEU	VERACRUZ, MEX.	250
XGOW	Hangkow, China	5000
3HA	Hamilton, Australia	300
4ZB	Dunedin, New Zealand	78
4ZM	Dunedin, New Zealand	100
4ZO	Dunedin, New Zealand	25

1020 KC

—	Krakow, Poland(2)	2000
EAJ-15	Barcelona, Spain(2)	3000
EAJ-19	Oviedo, Spain(2)	700
HJ4ABT	Medellin, Colombia	25
JOFG	Fukui, Japan	300
PRH4	Sao Paulo, Brazil	——
XEJ	JUAREZ, MEXICO	1000
XHHG	Shanghai, China	100
2KY	Sydney, Australia	1000

1030 KC

—	Konigsberg, Germany(1)	10000
CD103	Magallanes, Chile	100
CFCN	CALGARY, ALBERTA	10000
CKLW	WINDSOR, ONTARIO	5000
CMCY	HAVANA, CUBA	8000
CT-1GL	Lisbon, Portugal	30000
JBAK	Fusan, Korea	150
LR9	Buenos Aires, Argentina	5000
TIGZR	San Jose, Costa Rica	15
XEB	MEXICO CITY, MEX.	10000
3DB	Melbourne, Australia	600

1040 KC

—	Rennes, France	120000
CP4	La Paz, Bolivia	10000
JONK	Nagano, Japan	500
RW70	Leningrad, U.S.S.R.	10000
XHHH	Shanghai, China	100
5PL	Port Pirie, Australia	2000

PRH2 São Paulo 25,000

1050 KC

—	Washford Cross, Gr. Brit.	50000
CMKD	SANTIAGO, CUBA	250
CRCK	QUEBEC, P. Q.	1000
CX26	Montevideo, Uruguay	2000
HIT	TRUJILLO CITY, D. R.	100
HJ3ABX	Bogota, Colombia	1000
I-1BA	Bari, Italy(9)	20000
JOHG	Kagoshuma, Japan	500
RW33	Krasnodar, U.S.S.R.	1000
TIPLB	San Jose, Costa Rica	50
XHKA	Tientsin, China	100
2BH	Broken Hill, Austl.	100
2CA	Canberra, Australia	500

1060 KC

—	Radio-Cite, Paris, Fr.(8)	800
CB106	Santiago, Chile	150
HJ1ABG	Barranquilla, Colombia	500
JOIG	Toyanau, Japan	500
RW57	Tirospol, U.S.S.R.(8)	4000
XEA	GUADALAJARA, MEX.	125
XEAB	TOLUCA, MEX.	250
XEMG	ATZCAPOTZALCO, MEX.	100
XHHI	Shanghai, China	100
3YB	Melbourne, Australia	100
4MB	Mayborough, Australia	50

PRG2 10,000

1070 KC

—	Bordeaux, France(7)	100000
CMBX	HAVANA, CUBA	500
CMHA	SAGUA LA GRANDE, CU.	50
HJ4ABS	Medellin, Colombia(1)	25
JOOK	Kyoto, Japan	300
LR1	Buenos Aires, Argentina	50000
TICSM	San Jose, Costa Rica	450
VUA	Allahabad, India	100
XGOX	Honan-fu, China	200
XKRI	Canton, China(1)	100
6WB	Katanning, Australia	2000

1080 KC

—	Zareb, Yugoslavia(6)	800
JOIG	Yamagata, Japan	500
LT5	Resistencia, Arg.	500
OAX4F	Lima, Peru	100
PRC8	Rio de Janeiro, Brazil	250
PRI-4	Joao Pessoa, Brazil	10000
SCC	Falun, Sweden(6)	2000
XEBA	GUZMAN, MEX.	20
ZHHT	Shanghai, China	200
ZP7	Asuncion, Paraguay(3)	700
2AD	Armidale, Australia	——
4MK	Mackay, Australia	100
4TO	Fawnsville, Australia	200

1090 KC

CC109	Rancagua, Chile	100
CX28	Montevideo, Uruguay	3000
EA17	Madrid, Spain(5)	10000
HBBK-1	Heijo, Korea	——
RW75	Vinnitza, U.S.S.R.(5)	10000
TING	San Jose, Costa Rica	375
XGOB	Loyang, China	250
XLIO	Shaohing, China	——
1ZB	Auckland, N. Z.	350
3LK	Melbourne, Austl.	2000

PRA6 São Paulo 20,000

1100 KC

—	Madana, Latvia(4)	50000
CMCJ	HAVANA, CUBA	500
CRCV	VANCOUVER, B. C.	5000
HC2FSB	Guyaquil, Ecuador	200
I-1NA	Naples, Italy(4)	1500
OAX4J	Lima, Peru	250
XEL	MEXICO CITY, MEX.	1000
XHHS	Shanghai, China	100
YV5RG	Caracas, Venezuela	100
7LA	Lanceston, Australia	

1110 KC

—	Moravska Otrava, Czech.(3)	11200

2:45 to 8:00 PM

—	Radio Normandie, Fr.(3)	10000
CB111	Vina del Mar, Chile	1000
CD111	Magallanes, Chile	100
HIL	TRUJILLO CITY, D. R.	20
HJ3ABD	Bogota, Colombia(1)	1000
LS-5	Buenos Aires, Argentina	5000
OKK	Moravska, Czech.(3)	112000
XELO	TIAJUANA, MEX.	10000
YV5RE	Caracas, Venezuela	200
2VW	Sydney, Australia	1000

1120 KC

—	Shaerbeek, Belgium(2)	100
—	Newcastle, Gr. Britain(2)	1000
—	Alexandria, Egypt(2)	500
CD112	Osarno, Chile	100
CHLP	MONTREAL, P. Q.	100
CHSJ	ST. JOHN, N. B.	500
CKOC	HAMILTON, ONTARIO	500
CKX	BRANDON, MANITOBA	1000
CMGF	MATANZAS, CUBA	150
CMKM	MANZANILLO, CUBA	200
CW31	Salto, Uruguay	250
HAE	Nyiregyhaza, Hungary(2)	6200
LV5	San Juan, Argentina	500
ON4GT	Brussels, Belgium(2)	100
ON4RC	Brussels, Belgium(2)	100
TICA	San Jose, Costa Rica	25
XLHM	Shanghai, China	50
XLH	Shanghai, China	200
YV1RF	Maracaibo, Venezuela	250
2ZB	Wellington, N. Z.	——
4BC	Brisbane, Australia	1000

1130 KC 1931 Motala, Sweden 100,000

CB113	Quillota, Chile	100
CMJI	CIEGO DE AVILA, CUBA	250
CX30	Montevideo, Uruguay	500
LY8	Cordoba, Argentina	500
SBH	Horby, Sweden(1)	10000
XEJP	MEXICO CITY, MEX.	100
XGOL	Foo-Chow, China	250
XGOC	Nan-Chang, China	5000
ZP-1	Asuncion, Paraguay	100
3SH	Swan Hill, Australia	50
4VL	Charleville, Australia	50
6ML	Perth, Australia	500

1140 KC

—	Westerglen, Gr. Brit.(9)	20000
—	London, Gr. Britain(9)	20000
—	Moorside Edg. Gr. Brit.(9)	20000
CB114	Santiago, Chile	5000
CMBG	HAVANA, CUBA	200
I-1TO	Turin, Italy	7000
I-1TR	Trieste, Italy	10000
XHHL	Shanghai, China	100
2HD	Newcastle, Australia	500
4YO	Dunedin, N. Z.	200

1935 Berna 10,000

1150 KC

—	Kosice, Czechoslovakia(8)	10000
CMJF	CAMAGUEY, CUBA	200
HI4M	TRUJILLO CITY, D. R.	20
HJ1ABJ	Santa Marta, Colombia	1000
HJ5ABD	Cali, Colombia	500
LR8	Buenos Aires, Argentina	7000
TICMP	San Jose, Costa Rica	50
OAX4H	Lima, Peru	60
XEC	TIAJUANA, MEX.	100
XEDW	MINATITLAN, MEX.	20
XGOZ	Chinkeang, China	100
XYYY	Tsangchow, China	15
YV1RE	Maracaibo, Venezuela(3)	75
YV4RG	Maracay, Venezuela(3)	100
2WG	Wagga, Australia	200
2ZM	Gisborne, N. Z.	250

1160 KC

—	Monte Ceneri, Switz.(7)	15000
CB116	Valparaiso, Chile	1000
CMHJ	CIENFUEGOS, CUBA	200
CMKG	SANTIAGO, CUBA	——
HJ3ABJ	Bogota, Colombia	25
HC2ET	Guyaquil, Ecuador	40
LT3	Rosario, Arg.	4500
PRC2	Porto Alegre, Brazil	3000
PRD8	Nictheroy, Brazil	1000
PRD9	Sorocaba, Brazil	50
PRG4	Iaboticabal, Brazil	250
XEAS	SALTILLO, MEXICO	50
XEBJ	MERIDA, MEXICO	20
XED	GUADALAJARA, MEX.	500
XEP	JUAREZ, MEXICO	500
XHHU	Shanghai, China	100
2KA	Katoomba, Australia	100

1170 KC

—	Copenhagen, Denmark(6)	10000
CC117	Concepcion, Chile	100
CMBD	HAVANA, CUBA	150
CX32	Montevideo, Uruguay	500
LV-11	Santiago del Estero, Arg.	500
HJ4ABD	Medellin, Colombia	50
TIMC	San Jose, Costa Rica(5)	100
XLJE	Wusih, China	50
2NZ	Narrabi, Australia	2000
2ZD	Masterton, New Zealand	12

1180 KC

—	Nice PTT, France(6)	60000
CB118	Santiago, Chile	5000
CMIO	CIEGO DE AVILA, CUBA	50
LKM	Tromsoe, Norway(6)	100
RW20	Kharkov, U.S.S.R.(5)	10000
XEFA	MEXICO CITY, MEX.	500
XHJZ	Shanghai, China	150
3KZ	Melbourne, Australia	600

1190 KC

—	Cassel, Germany(5)	2000
—	Coblenz, Germany(5)	2000
—	Frankfurt, Germany(5)	25000
—	Freiburg, Germany(5)	5000
—	Kaiserslautern, Germany(5)	1500
—	Trier, Germany(5)	2000
CMKX	SANTIAGO, CUBA	——
HIJ	TRUJILLO CITY, D. R.	10
LS2	Buenos Aires, Argentina	30000
VONF	ST. JOHNS, NFLD.(5)	500
XLKA	Peiping, China(4)	30
2CH	Sydney, Australia	1000

1200 KC

—	Praha No. 2, Czech.(4)	5000
CB120	Valparaiso, Chile	1000
CHAB	MOOSE JAW, SASK.	100
CKNX	WINGHAM, ONTARIO	50
CKTB	ST. CATHERINES, ONT.	100
CMCO	HAVANA, CUBA	250
CW33	Florida, Uruguay	75
HCJB	Quito, Ecuador	30
HH2V	PT. AU PRINCE, HAITI	300
HJ4ABX	Manizales, Colombia	500
LT9	Santa Fe, Argentina	500
LV-15	Catamarca, Arg.	500
OAX4B	Lima, Peru	350
OAX5B	Iea, Peru	——
PRG9	Sao Paulo, Brazil	500
TIRCC	San Jose, Costa Rica	500
VUL	Lahore, India	100
XEBU	CHIHUAHUA, MEX.	50
XHHN	Shanghai, China	100
YV5RB	Caracas, Venezuela	1000
3YL	Christchurch, N. Z.	250
5KA	Adelaide, Australia	300

1210 KC

—	Lille, France(3)	60000
CD121	Osorno, Chile	100
CHLT	Sherbrook, Quebec	100
CJCS	STRATFORD, ONTARIO	50
CJCU	AKLAVIK, N. W. TER.	50
CKBI	PRINCE ALBERT, SASK.	100
CKCH	HULL, P. Q.	100
CKMC	COBALT, ONTARIO	50
CMHI	SANTA CLARA, CUBA	150
CX34	Montevideo, Uruguay	500
LV-10	Mendoza, Argentina	500
TGW	Guatemala City, Guat.	10000
XEAT	PARRAL, MEXICO	250
XEE	DURANGO, MEXICO	50
XEFV	JUAREZ, MEXICO	100
XETH	PUEBLA, MEXICO	100
XHKC	Tsingtao, China	100
XLPH	Pinghu, China	15
XLTC	Wusih, China	150
2GF	Grafton, Australia	100
6KG	Kalgoorlie, Australia	85

1220 KC

—	Bloemendaal, Holland	100
—	Norvik, Norway(2)	300
CMJE	CAMAGUEY, CUBA	50
HI5E	TRUJILLO CITY, D. R.	20
HJ1ABN	Barranquilla, Col.	25
HJ3ABE	Bogota, Colombia	500
I-1RO	Bologna, Italy	50000
PRA-9	Rio de Janeiro, Brazil	22000
TIVCA	San Jose, Costa Rica(5)	500
XEBL	MAZATLAN, MEXICO	50
XEDA	ANAYA, MEXICO	200
XETF	VERACRUZ, MEXICO	12
XGOT	Peiping, China	500
4AK	Oakey, Australia	1000
4ZL	Dunedin, New Zealand	100

1840 Rome 60,000

1230 KC

—	Gleiwitz, Germany	5000
CMCB	HAVANA, CUBA	150
LS8	Buenos Aires, Argentina	15000
XEG	MONTEREY, MEX.	100
XLIR	Hangchow, China	50
YNOP	Managua, Nicaragua	100
2NC	Newcastle, Australia	2000

1240 KC

—	Eskilstuna, Sweden	200
—	Juan les Pins, France(9)	2000
—	Orebro, Sweden	200
—	Saffle, Sweden	400
—	Varberg, Sweden	200
CB124	Valparaiso, Chile	250
CJCB	SYDNEY, N. S.	1000
CMHB	SANCTI SPIRITUS, CUBA	50
CW35	Paysandu, Uruguay	250
HJ4ABK	Medellin, Colombia	500
LU7	Bahia Blanca, Argentina	2000
LV-14	La Rioja, Argentina	500
PRA5	Sao Paulo, Brazil	5000
XEAP	OBREGON, MEX.	50
XEAY	MEXICO CITY, MEX.	100
XEBS	MEXICO CITY, MEX.	200
XEKL	LEON, MEXICO	500
XELA	SALTILLO, MEXICO	50
XHHY	Shanghai, China	100
2ZL	Hastings, New Zealand	50
3TR	Sale, Australia	500
6CK	Cork, Irish Free State	1000
6IX	Perth, Australia	500

1250 KC

—	Kiruna, Sweden(8)	200
—	Kuldiga, Latvia(8)	10000
—	Rome No. 3, Italy(8)	1000
CMKC	SANTIAGO, CUBA	100
CX36	Montevideo, Uruguay	250
EA18	San Sebastian, Spain(8)	——
HCRB	Guayaquil, Ecuador	150
HI1ABE	Cartagena, Colombia	500
HJ4ABK	Medellin, Colombia	300
LU-11	Neuquen, Argentina	500
MABS	Siangyang, China	35
OAX1A	Chiclayo, Peru	300

OAX4L	Miraflores, Peru	60
XENH	SAN LUIS POTOSI, MEX.	250
XLIF	Wusih, China	75
XLWU	Wusih, China	50

1260 KC

—	Nurnberg, Germany (7)	2000
CB126	Santiago, Chile	1000
CMOK	HAVANA, CUBA	150
LT-12	Santa Fe, Argentina	500
PRE3	Rio de Janeiro, Brazil	10000
XHHP	Shanghai, China	100
1-ZM	Manurava, New Zealand	200
3SR	Shepparton, N. Z.	200

1270 KC

—	Varna, Bulgaria	2000
CA127	Antofagasta, Chile	100
CC127	Chillan, Chile	100
CMHD	CAIBARIEN, CUBA	250
LS9	Buenos Aires, Argentina	6000
PRB4	Santos, Brazil	1000
PRG7	Jahu, Brazil	200
TUA	Tunis, Tunisia(5)	500
XDYF	Wuhu, China	75
XEXB	JALAPA, MEXICO	250
XEXE	TEXCOYO, MEX.	17
YNLF	Managua, Nicaragua	20
YV3RA	Baraquisimeta, Venez.	——
ZP4	Asuncion, Paraguay(5)	15
2SM	Sydney, Australia	1000
3YB	Warnambool, Australia	50

1280 KC

—	Aberdeen, Gr. Britain(5)	1000
—	Dresden, Germany(5)	250
—	Stara-Zagora, Bulgaria(5)	2000
CMCU	HAVANA, CUBA	150
CMKO	HOLQUIN, CUBA	250
PRG3	Rio de Janeiro, Brazil	10000
XEMX	MEXICO CITY, MEX.	100
XHJA	Hangkow, China	100
XHHQ	Shanghai, China	80
XOKC	Tientsin, China	100
YV1RK	Maracaibo, Venez.	1280
3AW	Melbourne, Australia	600
4ZC	Otago, N. Z.	45

1290 KC

—	Klagenfurt, Austria(4)	6000
—	Linz, Austria(4)	15000
—	Vararlburg, Austria	6000
CX38	Montevideo, Uruguay	5000
XGOE	Yungning, China	1000
4BK	Brisbane, Australia	500

1300 KC

—	Danzig, Danzig(3)	500
CB130	Santiago, Chile	1000
CPX	La Paz, Bolivia	5000
H17P	TRUJILLO CITY, D. R.	25
HJ5ABC	Cali, Colombia	25
HJ1ABA	Barranquilla, Col.	50
HJ2ABA	Tunja, Colombia	25
LT-10	Santa Fe, Argentina	500
LU6	Mar del Plata, Argentina	500
OAX4C	Lima, Peru	60
VOAC	ST. JOHNS, NFLD.	20
XOHC	Shanghai, China	1000
2TM	Tamworth, Australia	2000

1310 KC

CHCK	CHARLOTTETOWN, P.E.I.	50
CJKL	KIRKLAND LAKE, ONT.	1000
CJLS	YARMOUTH, N. S.	100
CKCV	QUEBEC, P. Q.	100
LS7	Buenos Aires, Arg.	——
SBC	Malmo, Sweden(2)	2500
SBI	Norrkoping, Sweden(2)	250
SBJ	Trolhatan, Sweden(2)	250
SBK	Karlstad, Sweden(2)	250
XEAG	CORDOBA, MEXICO	10
XEBO	IRAPUATO, MEX.	25
XECW	MEXICO CITY, MEX.	10
XEFW	TAMPICO, MEXICO	250
XETB	TORREON, MEXICO	125
XEX	MONTERREY, MEXICO	125
5AD	Adelaide, Australia	300

1320 KC

CB132	Valparaiso, Chile	1000
CD132	Valdivia, Chile	100
CMOX	HAVANA, CUBA	200
CW39	Payoandu, Uruguay	100
HAE-2	Magyarovar, Hungary(1)	1250
HJ4ABQ	Medellin, Colombia	25
PRE2	Rio de Janeiro, Brazil	500
XLIA	Ningpo, China	15
1-ZI	Auckland, New Zealand	100
3BA	Ballarat, Australia	50

1330 KC

—	Bremen, Germany	2000
—	Flensburg, Germany	2000
—	Hanover, Germany	2000
—	Lodz, Poland(9)	2000
—	Magdenberg, Germany	2000
ZHL	Singapore, Str. Settlm.	2000
—	Stettin, Germany	2000
CE133	Chillan, Chile	100
CMHK	CRUCES, CUBA	250
CX4O	Montevideo, Uruguay	500
LV4	San Rafael, Arg.	500
PRC5	Belem, Brazil	100
PRD7	Sorocaba, Brazil	500
PRF8	Bahia, Brazil	50
TIFQ	San Jose, Costa Rica	250
XGSA	Kiangyin, China	10
XLIK	Chang-Chow, China	75
4RO	Rockhampton, Australia	50
7HT	Rosny Hill, Australia	300

1340 KC

—	Cairo, Egypt	500
—	Konigsberg, Germany(8)	2000
—	Milan, Italy	4000
—	Radio-Vitus, Paris, Fr.(8)	800
—	Salzburg, Austria	2000
CB134	Santiago, Chile	1000
CMAB	PINAR DEL REY, CUBA	——
CMJL	CAMAGUEY, CUBA	75
CW19	Rivera, Uruguay	60
HRN	Tegucigalpa, Honduras	50
LKR	Rjukan, Norway(8)	150
LT7	Corrientes, Argentina	500
PRB3	Juiz de Fora, Brazil	250
PRD4	Araraguara, Brazil	250
XEFE	NUEVO LAREDO, MEX.	250
XEXD	JALAPA, MEXICO	350
XHHR	Shanghai, China	50
2RN	Dublin, Ir. Fr. State(8)	500
4ZR	Balclutha, N. Z.	10
5MU	Murray Bridge, Australia	200

1350 KC

—	Tampere, Finland (1)	700
—	Turin, Italy	200
CMCA	HAVANA, CUBA	200
CMKW	SANTIAGO, CUBA	——
HJ1AKB	Barranquilla, Colombia	25
HJ3ABO	Bogota, Colombia	25
LKN	Notodden, Norway(7)	150
LS6	Buenos Aires, Argentina	6000
XGOU	Kiangsu Prov., China	100
XQKA	Tientsin, China	150
YV4RA	Valencia, Venezuela	50
3GL	Geelong, Australia	100
4PM	Port Moresby, Papua	100

1360 KC

CD136	Magallanes, Chile	100
CMJH	CIEGO DE AVILA, CUBA	50
CW41	San Jose, Urugnay	50
HJ4ABN	Armenia, Colombia	25
XGOA	Nanking, China	1000
XQHD	Shanghai, China	200
3MA	Mildura, Austl.	100
4WK	Warwick, Australia	100

1370 KC

—	Basle, Switzerland(5)	500
—	Berne, Switzerland(5)	500
CC137	Temuco, Chile	100
CKCW	MONCTON, N. B.	100
CMGE	CARDENAS, CUBA	150
CX42	Montevideo, Uruguay	1000
H1Z	TRUJILLO CITY, D. R.	100
HJ4ABV	Medellin, Col.	25
XELZ	MEXICO CITY, MEX.	100
XEJ	MORELIA, MEX.	100
XECZ	SAN LUIS POTOSI, MEX.	100
YV5RI	Caracas, Venezuela	—
2MO	Gunnedah, Australia	100
3HS	Horsham, Australia	1000

1380 KC

—	Halsingborg, Sweden(4)	200
CB138	Santiago, Chile	150
CMCR	HAVANA, CUBA	150
XLHE	Shanghai, China	50
XLHF	Shanghai, China	50
4BH	Brisbane, Australia	1000

1390 KC

—	Montpelier, France(3)	5000
—	Radio Lyons, France(3)	25000
—	Tunis, Tunisia(3)	200
—	Varna, Bulgaria(3)	2000
CB139	Valparaiso, Chile	100
CJGX	YORKTOWN, SASK.	100
CMJC	CAMAGUEY, CUBA	150
H1H	SAN PEDRO, D. R.	75
LR-11	La Plata, Argentina	500
XLIN	Wusih, China	50
2GN	Goulburn, Australia	200
3MB	Birchip, Australia	——
4CA	Cairns, Australia	100
7BU	Burnie, Australia	——

1400 KC

—	Uddevalla, Sweden(2)	500
CB140	San Antonio, Chile	100
CMGC	MATANZAS, CUBA	100
CMKR	SANTIAGO, CUBA	100
CW37	Colonia, Uruguay	4500
FFZ	Shanghai, China	250
H16Y	TRUJILLO CITY, D. R.	100
HJ1ABR	Cartagena, Colombia	500
HJ4ABO	Armenia, Colombia	500
[redacted]	[redacted](5)	60
SBL	Umea, Sweden(2)	1000
SBM	Hudeksvall, Sweden(2)	1000
SBN	Ornskoldsvik, Sweden(2)	500
TGX	Guatemala City, Guat.	50
TITI	San Jose, Costa Rica	250
XLHO	Shanghai, China	100
YV4RE	Valencia, Venezuela	——
YV6RA	Bolivar, Venezuela	250
2ZO	Palmerston, N. Z.	100

1410 KC

—	Halmstad, Sweden(1)	200
—	Sfax, Tunisia(5)	30
CC141	Concepcion, Chile	100
CKFC	VANCOUVER, B. C.	50
CKMO	VANCOUVER, B. C.	100
CMCQ	HAVANA, CUBA	320
CS1AA	Lisbon(1)	40
CS1BI	Oporto(1)	50
CS1CF	Oporto(1)	300
CS1IR	Oporto(1)	250
CS1IO	Oporto(1)	40
CS1RP	Oporto(1)	100
CS1—	Oporto(1)	50
CS1RG	Oporto(1)	50
CS1—	Oporto(1)	300
CS1SR	Oporto(1)	300
CT1AX	Lisbon(1)	40
CT1BO	Lisbon(1)	50
CT1DH	Lisbon(1)	50
CT1DR	Lisbon(1)	40
CT1EB	Lisbon(1)	40
CT1GO	Parede(1)	300
CT1IV	Lisbon(1)	40
CT1KM	Lisbon(1)	40
CT1MO	Lisbon(1)	40
CX44	Montevedio, Uruguay	200
HI3A	SANTIAGO, D. R.	50
PRF6	Bahia, Brazil	500
PRF9	Porto Alegre, Brazil	500
PRG8	Bauru, Brazil	250
2KO	Newcastle, Australia	500

1420 KC

—	Alexandria, Egypt(9)	500
—	Turku, Finland(9)	600
—	Vass Vassa, Finland	500
CKGB	TIMMINS, ONTARIO	100
CRCY	TORONTO, ONTARIO	100
3XY	Melbourne, Australia	600

1430 KC

—	Bizerte, Tunisia(8)	350
CC143	Talca, Chile	100
CMJP	CAMAGUEY, CUBA	75
CW25	Duranzo, Uruguay	500
HAE-3	Miskolc, Hungary(8)	1250
LY-13	Jujuy, Argentina	500
RW-10	Minsk, U.S.S.R.(8)	100000
XLJA	Nanchang, China	——
2WL	Wollongong, Australia	600
4GY	Gumpie, Australia	50

1440 KC

—	Boras, Sweden(7)	200
—	Kalmar, Sweden(7)	200
CB144A	Santiago, Chile	100
CB144B	Santiago, Chile	100
CB144C	Santiago, Chile	100
CMOA	HAVANA, CUBA	150
HI-5X	SANTIAGO, D. R.	100
HP5-O	Colon, Panama	25
LS-11	La Plata, Argentina	700
XEFI	CHIHUAHUA, MEX.	250
XLHQ	Shanghai, China	40
2QN	Deniliquin, Australia	——
4IP	Ipswich, Australia	100

1450 KC

—	Paris, France(6)	20000
—	Sousse, Tunisia(5)	30
CC145	Rancagua, Chile	100
CFCT	VICTORIA, B. C.	75
CHGS	SUMMERSIDE, P. E. I.	50
CMHM	CIENFUEGOS, CUBA	100
CX46	Montevideo, Uruguay	1500
HJ5ABE	Cali, Colombia	500
HJ1ABI	Cienega, Colombia	25
XLIB	Suchow, China	15

1460 KC

—	Courtrai, Belgium(5)	100
CMKF	HOLGUIN, CUBA	50
CW47A	San Jose, Uruguay	100
PRA4	Bahia, Brazil	500
PRC9	Campinos, Brazil	250
PRD5	Rio de Janeiro, Brazil	1000
PRE5	Uberaba, Brazil	250
HAE-4	Pecs, Hungary(5)	1250
LU9	Necochea, Argentina	500
ON4ED	Antwerp, Belgium(5)	100
ZP3	Encarnacion, Paraguay(5)	50
ZP5	Asuncion, Paraguay(5)	75
7UV	Ulverstone, Australia	300

1470 KC

—	Bournemouth, Gr. Britain(4)	1000
—	Plymouth, Gr. Britain(4)	300
CW43	Lavelleja, Uruguay	100
H18Q	TRUJILLO CITY, D. R.	25
LT-11	Parana, Argentina	500
LU8	Santa Rosa, Argentina	500
XGDZ	Chang-Chow, China	10
2BE	Bega, Australia	100
2RG	Murrumbridges, Australia	50
3ZM	Christchurch, N. Z.	60

1480 KC

—	Gavle, Sweden(3)	200
CW47	Canelones, Uruguay	250
PRB8	Mogy das Cruces, Brazil	50
PRD3	Taubate, Brazil	50
PRE9	Portaleza, Brazil	500
PRF2	Rio Claro, Brazil	250
XQHF	Shanghai, China	200
2AY	Albury, Australia	100
4BU	Bundaberg, Australia	100

1490 KC

—	Binche, Belgium(2)	100
—	Nemes, France(2)	200
—	Upsala, Sweden(2)	200
CX48	Montevideo, Uruguay	1500
EAJ43	Tenerife, Canary Islands	8000
HJ4ABA	Medellin, Colombia	500
LT2	Posadas, Argentina	500
ON4CE	Chatelineau, Belgium(2)	100
ON4RW	Liege, Belgium(2)	100
XLKS	Kashing, China	20
2TM	Tamworth, Australia	50

1500 KC

—	Beziers, France	1500
—	Krestinehamm, Sweden	200
—	Pietarsaari, Finland	250

(Continued on page 545)

SHORT-WAVE BROADCAST STATION LIST

BOLD NUMERALS: MEGACYCLES. LIGHT NUMERALS: METERS. DOT (●): STATION DOES NOT VERIFY. DIAMOND (◆): STATION NOT IN USE.

Abbreviations: O—Opening; C—Closing; I—Interval; S—Signal; I.R.C.—International Reply Coupon.

Mc. & M.	*Call*	*Location & Schedule*
31.600 9.4 ●	WIXKA	Boston, Mass. (see W1XK 9.570 mc.) Daily 7 a.m.-1 a.m.
31.600 9.4 ●	WIXKB	Westinghouse Electric & Mfg. Co., Springfield, Mass. Daily 7 a.m.-1 a.m.
31.600 9.4 ●	W8XKA	Pittsburgh, Pa. (see W8XK 21.540 mc.) Daily 10 a.m.-12 Midnight.
31.600 9.4	W3XKA	Philadelphia, Pa. (see W3XAU 9.590 mc.) Daily 9 a.m.-10 p.m.
31.600 9.4	W8XWJ	4465 Penobscot Bldg., Detroit, Mich. Daily exc. Sun. 10:30 a.m.-5 p.m.
26.100 11.49 ● ◆	GSK	British Broadcasting Corp., Broadcasting House, London W1, England. Big Ben strikes the hour according to arrangement program. C: **God Save The King.'' I: Bow Bells.**
25.950 11.56	W6XKG	Washington Blvd. at Oak St., Los Angeles, Calif. Continuously 24 hours each day.
24.380 12.3 ●	CRCX	Rural Route No. 4, Bowmanville, Ontario, Canada. **Experimental.**
21.550 13.92 ◆	GST	Daventry, England (see 26.100 mc.)
21.540 13.92 ●	W8XK	Grant Bldg., Pittsburgh, Pa. O-C: **Stars and Stripes Forever.** Daily 7-9 a.m.
21.530 13.93 ●	GSJ	Daventry, England (see 26.100 mc.) Daily 5:45-8:55 a.m.; 9:15 a.m.-12 noon.
21.520 13.94	W2XE	485 Madison Ave., New York, N. Y. C: **Star Spangled Banner.** Daily exc. Sun. 6:30-9:30 a.m.; Sun. 7-9 a.m.
21.520 13.94 ◆	JZM	Overseas Section, The Broadcasting Corp. of Japan, Tokyo, Japan. O-C: **Kimigayo** National Anthem. Musical chimes follow. (see 11.800-15.160 mc.)
21.470 13.97 ●	GSH	Daventry, England (see 26.100 mc.) Daily 5:45-8:55 a.m.; 9:15 a.m.-12 noon.
21.460 13.98	WIXAL	World Wide Broadcasting Corp., University Club, Boston, Mass. O: News. **Blaze Away.** C: **Star Spangled Banner. Irregular.**
21.450 13.99	OLR6A	Radiojournal, Praha XII, Fochova Tr. 16, Praha, (Prague) Czechoslovakia. O-C: **Melody New World Symphony** and Cathedral chimes. I: 9 note trumpet call, repeated. **Irregular** (see 15.230-11.840 mc.)
19.020 15.77	HS8PJ	Superintending Engineer, Post and Telegraph Dept., Technical Section, Bangkok, Siam. O: 3 chimes, English Mondays, 8:10 a.m.
17.790 16.86	GSG	Daventry, England (see 26.100 mc.) Daily 1-3:15 a.m., 5:45-8:55 a.m.; 9:15 a.m.-10:30 a.m.; 12:15-6 p.m.; 9-11 p.m.
17.785 16.87	JZL	Nazaki, Japan (see 21.520 mc.) **Irregular.**
17.780 16.87	W3XAL	30 Rockefeller Plaza, New York, N. Y. Daily 9 a.m.-6:45 p.m., 7-9 p.m.
17.780 16.87 ◆	W9XAA	666 Lake Shore Drive, Chicago, Ill. S: 3 chimes each 15 minutes. O: **Star Spangled Banner.**
17.770 16.88	PHI	Philips Radio, Hilversum, Holland. Call: Seven languages. I: Metronome 80 beats per minute. C: National Anthem. Sun. 7:25-10:25 a.m., Mon., Tues, Thurs., Fri. 8:25-10 a.m., Sat. 8:25-10:30 a.m.
17.760 16.89	DJE	German Short Wave Station, Broadcasting House, Berlin, Germany. I: 9 musical notes, Folk Song. C: **National Horst-Wessel Lied and Duetschlandlied.** Daily 12:05-5:15 a.m., 5:55-11 a.m.; Sunday 11:10 a.m.-12:25 p.m.
17.760 16.89 ◆	W2XE	Wayne, N. J. (see 21.520 mc.)
17.755 16.90	ZBW-5	Hong Kong, China (see 9.525 mc.)
15.530 19.32	HS8PJ	Bangkok, Siam (see 19.020 mc.) Occasional Mondays 8-10 a.m.
15.370 19.52	HAS-3	Director Radio, Hungarian Post, Gyali St., 22, Budapest, Hungary. I: Musical Box Melody; O: Bells ringing; C: **Lord Bless the Hungarian (national anthem).** Sunday 9-10 a.m.
15.360 19.53	DZG	Zeesen, Germany (see 17.760 mc.) **Irregular.**
15.340 19.56	DJR	Zeesen, Germany (see 17.760 mc.) Daily 8-9 a.m.; 4:50-10:45 p.m.
15.330 19.56	W2XAD	General Electric Co., 1 River Rd., Schenectady, N. Y.; O: Spark Discharge. C: **Star Spangled Banner.** Daily 10 a.m.-8 p.m.
15.320 19.58	OLR5B	Prague, Czechoslovakia. (see 21.450 mc.) **Irregular** (see 15.230-11.840 mc.)
15.310 19.60 ●	GSP	Daventry, England (see 26.100 mc.) Daily 6:20-8:30 p.m.
15.300 19.61	CP7	Casilla 637, La Paz, Bolivia. O: One gong and chimes following. **Irregular.**
15.300 19.61	XEBM	P. O. Box 50, Mazatlan, Mexico. Daily 9-10 a.m.; 1-2 p.m., 8-10 p.m.
15.290 19.62	LRU	Radio El Mundo, Maipu, 555, Buenos Aires, Argentina, S.A. O-C: English only. Daily 7-9 a.m.
15.280 19.63	HI3X	J. R. Saladin, Director of Radio Communications, Ciudad Trujillo, Dominican Republic. S: Bells. Weekdays 12:10-1:10 p.m.; Sundays 7:40-10:40 a.m.
15.280 19.63	DJQ	Zeesen, Germany (see 17.760 mc.) Daily 12:05-5:15 a.m.; 6-8 a.m.; 8:15-11 a.m.; 4:50-10:45 p.m. Sunday 11:10 a.m.-12:25 p.m.
15.270 19.64	W2XE	Wayne, N. J. (see 21.520 mc.) Daily exc. Sun. 2-5 p.m.; Sun. 12-3 p.m.; 4-5 p.m.
15.260 19.66 ●	GSI	Daventry, England (see 26.100 mc.) Daily 12:15-4 p.m.; 9-11 p.m.
15.250 19.67	WIXAL	Boston, Mass. (see 21.460 mc.) **Irregular.**
15.243 19.68	TPA-2	Minister des Postes, Boulevard Haussmann, 98, Bis., Paris, France. I: Three tones F in Morse. O-C: **La Marseillaise;** S: chimes 1/4 hour. Daily 5-10 a.m.
15.230 19.70	OLR5A	Prague, Czechoslovakia (see 21.450 mc.) Daily 2-2:15 p.m. **News.**
15.220 19.71	PCJ	Philips Radio, Hilversum, Holland. Tues. 4:30-6 a.m., Wed. 8-11 a.m.
15.210 19.72	W8XK	Pittsburgh, Pa. (see 21.540 mc.) Daily 9 a.m.-7 p.m.
15.200 19.74	DJB	Zeesen, Germany (see 17.760 mc.) Daily 12:05-5:15 a.m.; 5:55-11 a.m.; 11:10 a.m.-12:25 p.m.; 4:50-10:45 p.m. Sunday 8-9 a.m.
15.190 19.75	ZBW-4	Hong Kong, China (see 9.525 mc.)
15.183 19.76	RV96	Moscow, U.S.S.R. (see RKI 15.040 mc.) **Irregular.**
15.180 19.76 ●	GSO	Daventry, England (see 26.100 mc.) Daily 1-3:15 a.m.; 4-6 p.m.; 6.20-8:30 p.m.
15.160 19.79	OLR5C	Prague, Czechoslovakia (see 21.450 mc.) **Irregular** (see 15.230-11.840 mc.)
15.160 19.79	XEWW	Mexico, D. F. (see 9.500 mc.)
15.160 19.79	JZK	Nazaki, Japan (see 21.520 mc.) Daily 12:30-1:30 a.m.; 8-9 a.m.; 3-4 p.m.; 4:30-5:30 p.m.
15.155 19.80	SM5SX	Royal Technical University, Stockholm, Sweden. Daily 11 a.m.-5 p.m.
15.150 19.80	YDC	N.I.R.O.M., Koningsplein West 5, Batavia, Java, N.E.I. (Location-**Soerabaja**). Daily 5:30-10 a.m.; 6-8:30 p.m.; 10:30 p.m.-2 a.m.
15.140 19.82 ●	GSF	Daventry, England (see 26.100 mc.) Daily 10:45 a.m.-12 noon; 4-6 p.m.; 6:20-8:30 p.m.
15.121 19.84	HVJ	Stazione Radio HVJ, Citta del Vaticano, Vatican City. I: clock ticks 5 m. S: Bells. C: (spoken) **Laudetur Jesus Christus.** Weekdays 10:30-10:45 a.m.
15.110 19.85	DJL	Zeesen, Germany (see 17.760 mc.) Daily 12-2 a.m.; 8-9 a.m.; 11:35 a.m.-4:30 p. m.; Sunday 6-8 a.m.
15.040 19.95	RKI	Radio Centre, Solianka 12, Moscow, U.S.S.R. Call: "This is Moscow Calling." O-C: **Internationale. Daily 7-9:15 p.m. No I.R.C. required.**
14.970 20.04	LZA	Director General, Telegraphs and Telephones, Sofia, Bulgaria. O: Racherutza-(Bulgarian Folk Dance). C: National Anthem and **Hymn of His Majesty the King.** Weekdays 5-6:30 a.m.; 12-2:45 p.m.; Sundays 12 a.m.-4 p.m.
14.600 20.55	JVH	Nazaki, Japan (see 21.520 mc.) **Irregular.**
14.535 20.64	HBJ	Radio Suisse, S.A., 12, Quai de la Poste, Geneva, Switzerland. No opening or closing selection. Call —"League of Nations Wireless." Saturdays 6:45-8:30 p.m.
14.460 20.75	DZH	Zeesen, Germany (see 17.760 mc.) **Irregular.**
13.635 22.00	SPW	Polskie Radio, 5, Mazowiecka St., Warsaw, Poland. Mon., Wed., Fri. 12:30-1:30 p.m. Sun. 11:30 a.m.-1:30 p.m.
13.600 22.06	ZMBJ	TSS Awatea, Union Line S.S., Coy Head Office, Wellington, New Zealand. Daily 1-3 a.m., Sundays 6:40-7 p.m.
12.500 24.00	HIN	Ciudad Trujillo, Dom. Rep., W. I. (see 6.243 mc.) Daily exc. Sun. 11:40 a.m.-1:40 p.m.; 7:10-9:50 p. m.
12.300 24.39	CB615	Radio Service, Desmaras and Cia., Ltd., Casilla 761, Santiago, Chile, S.A. Daily 11 a.m.-1 p.m.; 4-8 p.m.; 10-11 p.m.
12.235 24.52	TFJ	Icelandic State Broadcasting Service, P. O. Box 547, Reykjavik, Iceland. First half English. C: Icelandic National Orchestra and chorus voices. Sundays 1:40-2:30 p.m.
12.130 24.73	DZE	Zeesen, Germany (see 17.760 mc.) **Irregular.**
12.000 25.00	RNE	Moscow, U.S.S.R. (see RKI, 15.040 mc.) Sun. 6-7 a.m.; 10-11 a.m.; 4-5 p.m.; Mon. 4-5 p.m.; Wed. 6-7 a.m.; 4-5 p.m.; Fri. 4-5 p.m.
11.960 25.08	HI2X	Ciudad Trujillo, Dom. Rep. (see 15.280 mc.) Tues. and Fri. 8:10-10:10 p.m.
11.900 25.21	XEWI	P. O. Box 2874, Mexico, D.F. S: 2 strokes gong. O-C: **May Angels Guard Thee.** Sun. 12:30-2 p.m.; Mon., Wed., Fri. 3-4 p.m.; 9 p.m.-12 a.m.; Tues., Thurs. 7:30 p.m.-12 a.m.; Sat. 9 p.m.-12 a.m. (see 6.015 mc.)
11.900 25.21	OLR4D	Prague, Czechoslovakia (see 21.450 mc.) **Irregular** (see 15.230-11.840 mc.)
11.895 25.22	XEXR	Departamento Autonomo de Propaganda y Publicidad, Mexico, D. F. Daily 6-11:30 p.m.
11.895 25.22	HP5I	Emisora HP5I, Aguadulce, Panama. English—beginning and closing. I: three notes gong, thrice (9) ea. 30 mins. O-C: **El Tambor de la Alegria. Daily 7:30-9:30 p.m. Veri cards free.**
11.885 25.24	TPA3	Pontoise, France (see 15.243 mc.) Daily 1-4 a.m., 11:15 a.m.-5 p.m.
11.880 25.25	XEXA	Secretaria de Educacion Publica, Mexico, D. F. O-C: **March of the Toys.** Daily exc. Sun. 8-11:30 a.m.; 3-5 p.m.; 7-11 p.m.
11.875 25.26	OLR4C	Prague, Czechoslovakia (see 21.450 mc.) **Irregular** (see 15.230-11.840 mc.)
11.870 25.26	W8XK	Pittsburgh, Pa. (see 21.540 mc.) Daily 7-10 p.m.
11.860 25.29	YDB	Soerabaja, Java (see 15.150 mc.) Daily 10:30 p.m.-2 a.m.
11.860 25.29 ● ◆	GSE	Daventry, England. (See 26.100 mc.)
11.855 25.31	DJP	Zeesen, Germany (see 17.760 mc.) **Irregular**
11.840 25.34	OLR4A	Prague, Czechoslovakia (see 21.450 mc.) Daily 2:30-4:30 p.m. Mon. & Thurs. 7-9:10 p.m.
11.840 25.34	KZRM	Erlanger and Galinger, Inc., Regina Bldg., David St., Manila, P. I. Daily 4-10 a.m. (see 9.570 mc.)
11.830 25.36	W2XE	Wayne, N. J. (see 21.520 mc.) Daily exc. Sun. 5:30-11 p.m. Sun. 6-11 p.m.
11.830 25.36	W9XAA	Chicago, Ill. (see 17.780 mc.) Week days 9 a.m.-6 p.m., Sun 9-11 a.m., 1-5:30 p.m.
11.820 25.38	XEBR	Apartado 68, Hermosillo, Son. Mexico. O-C: **Over The Waves.** Daily 1-4 p.m.; 9 p.m.-12 a.m.
11.820 25.38 ● ◆	GSN	Daventry, England (see 26.100 mc.)
11.810 25.40	2RO-4	5 Via Montello, Rome, Italy. O: **Bells of Rome.** C: **Italian Royal March** and **Giovinezza.** I: bird call—black cap bird. Daily 6:43 a.m.-6 p.m.; Sat. off 5:30 p.m. Am. Hours—M, W, F, 6-7:30 p.m. So. Am. Hr. T, Th, S, 6-7:45 p.m.
11.805 25.41	OXY	Skamleback, Denmark (see 6.060 mc.) Daily 5-10 p.m.
11.801 25.42	OER-2	Osterr. Radioverkehrs A.G., Johannesgasse 4h, Wien 1, Austria. Call: "Hier Radio Wien." I: Metronome—60 beats per m. Weekdays 9 a.m.-5 p.m. Sat. to 6 p.m.

Mc. & M.	Call	Location & Schedule
11.800 25.42	JZJ	Nazaki, Japan (see 21:520 mc.) Daily 8-9 a.m.; 3-4 p.m.; 4:30-5:30 p.m.
11.800 25.42	COGF	General Betancourt 51, (Playa) Matanzas, Cuba. O-C: **Vals Diana.** Weekdays 1-4 p.m., 6-10 p.m. Sun. 9-10 p.m.
11.796 25.43	OAX5A	Avenida San Luis, Ica, Peru, S.A. O: March, **"Relator".** C: **"Estrellita."** Daily 12-4 p.m. 7-11:30 p. m.
11.795 25.43	DJO	Zeesen, Germany (see 17.760 mc.) **Irregular.**
11.790 25.43	WIXAL	Boston, Mass. (see 21.460 mc.) Daily exc. Sun. 2-5:30 p.m.
11.770 25.49	DJD	Zeesen, Germany (see 17.760 mc.) Daily 11:35 a.m.-4:30 p.m.; 4:50-10:45 p.m.
11.760 25.50	XETA	Apartado 203, Monterrey Mexico. Daily 7-11 p.m.
11.760 25.50	DLR4B	Prague, Czechoslovakia (see 21.450 mc.) **Irregular** (see 15.230-11.840 mc.)
11.750 25.53	GSD ●	Daventry, England (see 26.100 mc.) Daily 1-3:15 a.m.; 12:15-4 p.m.; 6:20-8:30 p.m., 9-11 p.m.
11.740 25.55	HP5L	Apartado 129, David, Chirigui, Panama, C. A. Daily 4-7 p.m.
11.730 25.57	XETM	Villahermosa, Mexico. Daily 6-11 p.m.
11.730 25.57	PHI ◆	Hilversum, Holland (see 17.770 mc.)
11.720 25.60	CJRX	Royal Alexander Hotel, Winnipeg, Manitoba, Canada. Weekdays 6:30-11:00 p.m. Sundays 5-10 p.m.
11.720 25.60	TPA-4	Pontoise, France (see 15.243 mc.) Daily 5:15-7:15 p.m., 9 p.m.-12 a.m.
11.718 25.60	CR7BH	Lourenco Marques, Portuguese East Africa (see CR7AA, 6.137 mc.) Weekdays 4:30-6:30 a.m.; 9:30-11 a.m.; 12:30-4 p.m. Sundays 5-7 a.m.; 10 a.m.-12:30 p.m.; 2-4 p.m.
11.710 25.62	YSM	Director of Communicaciones, San Salvador, El Salvador, C.A. Daily 6-10 p.m.
11.710 25.62	Philco Radio	211-213D Rue Catinat, Saigon, Indo-China. Daily 6:30-9:30 a.m. **News in French 9-9:10 a.m.**
11.710 25.62	VK9MI	M.V. **Kanimbla,** McIllwraith and McEacharn, Bridge St., Sydney, Australia. 11 p.m.-8 a.m. and later.
11.705 25.63	SBP	Chief Engineer, Motala, Sweden. Daily 6-9 a.m., 11 a.m.-4 p.m.
11.700 25.64	HP5A	P. O. Box 954, Panama City, Panama, C.A. Daily 10 a.m.-10:30 p.m.
11.570 25.93	HH2T	Societe Haitienne Radiodiffusion, P.O. Box 103, Port-au-Prince, Haiti, W.I. S: 4 tones gong 1-3-2-4. English and French. O-C: **The Swan. Special programs, irregular.**
11.500 26.09	COCX	P. O. Box 32, Havana, Cuba. S: 5 bells. English each ½ hr. O-C: **Pajarillo Barrangueno.** Daily 8 a.m.-1 a.m.
11.402 26.31	HBO	Geneva, Switzerland (see HBJ, 14:535 mc.) Mondays 12:40-1:40 a.m. Saturdays 6:45-8:30 p.m.
11.040 27.17	CSW	Emissora Nacional, Rua do Quelhas, Lisbon, Portugal. Daily 12-5 p.m.
11.000 27.27	PLP	J. Sanders, Chief Engr., Java Wireless Stations, Bandoeng, Java. D.E.I. Daily 5-10 a.m. 6-8:30 p.m.; 10:30 p.m.-2 a.m.
10.960 27.37	JZB	Nazaki, Japan. (See 21.520 mc.) **Irregular.**
10.740 27.93	JVM	Nazaki, Japan (see 21.520 mc.) 4:30-7:30 a.m. **Irregular.**
10.670 28.12	CEC	Cia Internacional de Radio, Casilla 16-D, Santiago, Chile. Daily exc. Sat. and Sun. 7-7:20 p.m. (see CED, 10.230 mc.)
10.660 28.14	JVN	Nazaki, Japan (see 21:520 mc.) Daily 3-7:30 a.m.
10.370 28.93	EAJ43	Radio Club Tenerife, Apartado 225, Santa Cruz, Tenerife, C.I. Daily 2:15-3:30 p.m.; 6-7 p.m.; 7:10-9:30 p.m.
10.370 28.93	EHZ	Tablero, Tenerife, C. I. Daily 3-4 p.m.; 6-8:15 p.m.
10.350 28.98	LSX	Transradio Internacional, San Martin, 329, Buenos Aires, Argentina, S.A. C: **San Lorenzo March. Irregular 5-8 p.m.**
10.330 29.04	ORK	Director de Communications, Bruxelles, Belgium. I: Carrillion. O: **Towards The Future.** C: **Brabanconne.** Daily 1:30-3 p.m.
10.290 29.15	DZC	Zeesen, German (see 17.760 mc.) **Irregular.**
10.260 29.24	PMN	Bandoeng, Java, D.E.I. (see PLP, 11.000 mc.) Daily 5:30-10 a.m.; 6-8:30 p.m.; 10:30 p.m.-2 a.m.
10.230 29.33	CED	Antofagasta, Chile (see CEC 10.670 mc.) Sat. and Sun. 7-7:20 p.m.
10.135 29.60	CQN	Chief of Radio Station CQN, Post Office Bldg., Macao (Portuguese) China. O: **Maria da Fonte.** C: National—**A Portuguesa.** Mon. and Fri. 7-8:30 a.m.
10.042 29.87	DZB	Zeesen, Germany (see 17.760 mc.) **Irregular.**
9.940 30.18	CSW	Lisbon, Portugal (see 11.040 mc.) Daily 5-8 p.m.
9.925 30.23	JDY	Darien, Manchukuo, Japan. Daily 7-8 a.m.
9.860 30.43	EAQ	P. O. Box 951, Madrid, Spain. O: **La Verbena de la Paloma.** C: **Himno de Riego or Good Night Melody.** Sat 1-3:30 p.m. Daily 5:15-9:30 p.m.
9.840 30.49	COCM	Apartado 33, Havana, Cuba. Daily 6 p.m.-12 a.m.
9.750 30.77	COCQ	Calle 25, No. 445, Havana, Cuba. Weekdays 6:55 a.m.-1 a.m.; Sundays 6:55 a.m.-12:01 a.m.
9.675 31.00	DZA	Zeesen, Germany (see 17.760 mc.) **Irregular.**
9.670 31.02	TI4NRH	Apartado 40, Heredia, Costa Rica, C.A. Daily 9-10 p.m.; 11:30 p.m.-12 a.m.; Sat. to 2 a.m.
9.666 31.04	CR6AA	Caixa Postal 103, Lobito, Angola, Portuguese West Africa. I: 3 notes on piano: A-C-B. Portuguese, French and English. Wed. and Sat. 2:45-4:30 p.m.
9.660 31.06	LRX	Buenos Aires, Argentina, S.A. (see LRU, 15.290 mc.) Daily 9:30 a.m.-11:30 p.m.
9.650 31.09	CT1AA	Antonio Augusto de Aguair, 144 Lisbon, Portugal. I: Cookoo, 3 times. C: **A Portuguesa** (national anthem.) Tues., Thurs., Sat. 4-7 p.m.
9.645 31.10	HH3W	P. O. Box A117, Port-au-Prince, Haiti, W.I. Daily exc. Sunday 1-2 p.m.; 7-8:30 p.m.
9.635 31.13	2RO-3 ◆	Rome, Italy (see 11:810 mc.)
9.616 31.20	HJ1ABP	P. O. Box 37, Cartagena, Colombia, S. A. O-C: **Under The Double Eagle.** Daily 7-9 a.m.; 11 a.m.-1:20 p.m.; 6-11 p.m.
9.600 31.25	RAN	Moscow, U.S.S.R. (see RKI, 15.040 mc.) Daily 7-9:15 p.m.
9.600 31.25	XEYU	Universidad Nacional, Mexico, D.F. Daily 7-10 p.m.
9.600 31.25	CB960	Casilla 1342, Santiago, Chile, S.A. O: **Babes In Toyland.** C: **Rhapsody in Blue** (organ). Daily 11:30 a.m.-2 p.m.; 9:30 p.m.-12 a.m. **Veri slow.**
9.595 31.27	HBL	Geneva, Switzerland (see HBJ, 14.535 mc.) Saturdays 5:30-6 p.m.
9.595 31.27	YNLF	Calle, 15 de Set No. 206, Managua, Nicaragua, C.A. Daily 8-9 a.m.; 1-3 p.m.; 6:30-10:30 p.m. **Veri—5c U. S. postage.**
9.590 31.28	VK6ME	Amalgamated Wireless Ltd., Perth, West Australia. (Address 47 York St., Sydney, Australia). Daily exc. Sun. 6-8 a.m.
9.590 31.28	W3XAU	1622 Chestnut St., Philadelphia, Pa. Daily 11 a.m.-7 p.m.
9.590 31.28	VK2ME	Amalgamated Wireless, Ltd. 47 York St., Sydney, Australia. Clock strikes at hour, chimes ¼ hr. I: Kookaburra bird call. C: **God Save The King.** Sunday 12:30-2:30 a.m.; 4:30-8:30 a.m.; 9:30-11:30 a.m.
9.590 31.28	HP5J	Apartado 867, Panama City, Panama, C. A. **News** 6:30 p.m. O: **Blackhorse Troop March.** C: **Discipline Honor and Abnegation.** Weekdays 12-2 p.m.; 5-10:30 p.m. Sundays 10:30 a.m.-2 p.m.; 8-10 p.m.
9.590 31.28	PCJ	Hilversum, Holland, (see 15.220 mc.) Sunday 2-3 p.m.; 7-8 p.m. Tues. 1:30-3 p.m., Wed. 7-10 p.m.
9.580 31.32	GSC ● ◆	Daventry, England (see 26.100 mc.)
9.580 31.32	VK3LR	Australian Broadcasting Commission, G.P.O. Box 1686, Melbourne, Australia. O: Recording, song, **Australian Lyre Bird.** C: **God Save The King.** S—3 notes, gong; time signals and P.O. chimes. Sun 3 a.m.-7:30 a.m.; 9:45 p.m.-2 a.m.; 3:30-8:30 a.m. Saturdays to 9 a.m.
9.575 31.33	HJ2ABC	Sr. Pompilio Sanchez, Prop., Cucuta, Colombia, S.A. Daily 11 a.m.-12 noon; 6:30-9 p.m.
9.570 31.33	WIXK ●	Westinghouse Electric and Mfg. Co., Boston, Mass. **O-C: Stars and Stripes Forever.** Daily 7 a.m.-1 a.m.
9.570 31.33	KZRM	Manila, P. I. (see 11.840 mc.) Daily 4-10 a.m.
9.565 31.36	YV3RB	Sr. Arturo Ramos Maggi, Prop., Barquisimeto, Venezuela. Daily 11:30 a.m.-12:30 p.m.; 5:30-9:30 p.m.
9.562 31.38	OAX4T	Radio Nacional, Peruvian Government, Av. Petiti Thouars, Lima, Peru. Daily 7-11 p.m.
9.560 31.38	DJA	Zeesen, Germany (see 17.760 mc.) Daily 12:05-5:15 a.m.; 5:55-11 a.m., 4:50-10:45 p.m.
9.560 31.38	HJ1ABB	Apartado 715, Barranquilla, Colombia, S.A. Daily 7 a.m.-12:30 p.m. **Veri slow.**
9.550 31.41	XEFT	Av. Indepenencia 28, Santa Cruz, Mexico. S: Chimes, bugle calls or cookoo horn. English at closing. O-C: **Vals Poetico.** Weekdays 10:30 a.m.-4:30 p.m.; 7:30 p.m.-12:30 a.m.; Sundays 9 p.m.-12:30 a.m.
9.550 31.41	YDB	Soerabaja, Java N.E.I. (see 15.150 mc.) Weekdays 5:30-10:30 a.m. or 11 a.m.; 6-7:30 p.m.; 10:30 p.m.-2 a.m. Sunday 5:30-10:30 a.m.; 7:30 p.m.-2 a.m.
9.550 31.41	HI5E	Sr. H. Chavez, Ciudad Trujillo, Dom Rep., W. I.; **Irregular.**
9.550 31.41	DLR3A	Prague, Czechoslovakia (see 21.450 mc.) Irregular (see 15.230-11.840 mc.)
9.545 31.44	HH2R	Port-au-Prince, Haiti, W.I. (see HH2T, 11.570 mc.) **Special programs irregular.**
9.540 31.45	VPD-2	Amalgamated Wireless, Ltd., Suva, Fiji Islands. C: **God Save the King.** Daily 5:30-7:30 a.m.
9.540 31.45	DJN	Zeesen, Germany (see 17.760 mc.) Daily 12:05-5:15 a.m.; 5:55-11 a.m.; 4:50-10:45 p.m.
9.535 31.46	JZI	Nazaki, Japan (see 21.520 mc.) 4:30-7:30 a.m. **Irregular.**
9.530 31.48	W2XAF	Schenectady, N. Y. (see W2XAD, 15.330 mc.) Daily 4 p.m.-12 a.m.
9.530 31.48	LKJ-1	Ministere du Commerce, Administrator des Telegraphes, Oslo, Norway. I: Piano motif Grieg's **Sigurd Jorsalfar.** C: National—**Yes, We Love This Country.** Daily 5-8 a.m.; 11 a.m.-5 p.m.
9.525 31.49	ZBW-3	Hong Kong Broadcasting Committee, P.O. Box 200, Hong Kong, China. I-O-C: none. Daily exc. Sat. 11:30 p.m.-1:30 a.m. Mon. and Thurs. 4-10 a.m. Tues., Wed., Fri., Sun. 3-10 a.m., Sat. 3-11 a.m.; 9 p.m.-1:30 a.m.
9.524 31.50	FIQA	Tananarive, Madagascar (see 6.000 mc.) Daily 12:30-12.45 a.m.; 3:30-4:30 a.m.; 10-11 a.m. **simultaneously on 6.000 mc.**
9.523 31.50	Radio Liberte	Stato Operal, 25 Liberte, Paris, France. Daily 7-8 p.m. (see 7.380 mc.)
9.520 31.51	HJ4ABH	Armenia, Colombia, S.A. O-C: **The Spanish Soldiers.** S: Blows on Marimba. **News 7-10 p.m.** Weekdays 8-11 a.m.; 6-10 p.m. Sundays 7-10 p.m.
9.520 31.51	XEDQ	Apartado 197, Guadalajara, Jalisco, Mexico. O-C: Mexican Dance—**Jarabe Tapatio.** Daily 12-4 p.m. 8 p.m.-12 a.m. **Occasional DX Sunday 2-4 a.m.**
9.510 31.55	GSB ●	Daventry, England (see 26-100 mc. Daily 1-3:15 a.m.; 12:15-6 p.m.; 9-11 p.m.
9.510 31.55	HJU	Buenaventura, Colombia, S.A. O-C: **Palmira.** English each 5 mins. Mon., Wed., Fri. 12-2 p.m.; 8-11 p.m.
9.510 31.55	VK3ME	Amalgamated Wireless Ltd., 167-9 Queen St., Melbourne, Australia. S: Chimes and striking on hour. C: **God Save the King.** Daily exc. Sun. 4-7 a.m.
9.504 31.57	OLR3B	Prague, Czechoslovakia, (See 2.450 mc.) Irregular (see 15.230-11.840 mc.)
9.500 31.58	PRF5	P.O. Box 709, Rio de Janeiro, Brazil, S.A. I: three-note gong. C: Brazilian National Anthem. Daily exc. Sun. 4:45-5:45 p.m.
9.500 31.58	HI5G	La Vega, Dominican Republic, W.I. Daily 6:40-8:40 a.m.; 10:40 a.m.-2:40 p.m.; 4:40-8:40 p.m.
9.500 31.58	HJ1ABE	Apartado 31, Cartagena, Colombia, S.A. O: Organ—**Song of the Islands.** English each hour; clock strikes the hour. C: **Aloha Oe. DX 9:30-10:30 p.m.** Weekdays 6:45 a.m.-11 p.m.; Sun. 9 a.m.-3 p.m.
9.500 31.58	XEWW	Apartado 2516, Mexico, D.F. Daily 7 p.m.-12 a.m.
9.480 31.65	EAR	P.O. Box 951, Madrid, Spain. Daily 6:30-8:30 p.m.; 10-11 p.m.
9.450 31.75	"Radio Fort de France"	Edouard Boullanger Fils, Fort de France, Martinique. Daily 11:30 a.m.12:30 p.m.; 6:15-7:15 p.m.; 8-9 p.m.
9.450 31.75	TGWA	Radiodifusora Nacional, Guatemala City, Guatemala, C.A. Daily exc. Sun. 12-2 p.m.; 8-9 p.m.; 10 p.m.-12 a.m.; Sun. 12-2 p.m.; 12 a.m.-6 p.m.; **No I.R.C. necessary.**
9.440 31.78	HCODA	Guayaquil, Ecuador, S.A. Daily exc. Sunday 8-11 p.m. **Veri—U.S. postage.**
9.428 31.81	COCH	P.O. Box 41, Havana, Cuba. English each 15 mins. S: chimes 15 m. 2 blows gong adv. O-C: Organ. **Maria My Own.** Daily 8 a.m.-12 a.m.
9.400 31.91	CO9BC	Monte No. 139, Apartado No. 132, Havana, Cuba. Daily 7 a.m.-12:30 a.m.
9.350 32.09	HS8PJ	Bangkok, Siam (see 19.020 mc.) Thursdays 8-10 a.m.
9.340 32.12	OAX4J	Radio Internacional Casilla 1166 Lima, Peru. C: Organ: **Good Night Sweetheart.** Daily 12-3 p.m.; 5 p.m.-1 a.m.
9.300 32.27	YNGU	Apartado 295, Managua, Nicaragua, C.A. Weekdays 12-2 p.m.; 5-6 p.m. Sun. 11 a.m.-12 noon. **Veri—5c U.S. postage.**

Mc. & M.	Call	Location & Schedule
9.125 32.88	**HAT-4**	Budapest, Hungary (see HAS-3, 15.370 mc.) Sun. and Wed. 7-8 p.m.; Sat. 6-7 p.m.
9.120 32.89	**CP6**	La Paz, Bolivia, S.A. (see CP7. 15.300 mc.) **Irregular.**
9.030 33.32	**CDBZ**	P.O. Box 866, Havana, Cuba. S-4 chimes, O-C: Record, **"Popular Melodies"** 7:45 a.m.-12:30 a.m. Sat. to 2 a.m.
8.948 33.53	**HC1B**	Casilla 691, Quito, Ecuador, S.A. O: March **Patria.** 1: 4 blows on gong. C: **Ecuadorian National Anthem.** Daily 7:30-8:45 a.m. Exc. Mon. 11:30 a.m.-2:30 p.m.; 5-10 p.m. (to 7 p.m. on 4.107 mc.; after 7 p.m. on 4.107 mc. and 8.948 mc.) **Veri—U.S. postage.**
8.840 33.94	**ZMBI**	Wellington, N. Z. (see 13.600 mc.) Sun. 6:40-7 p.m.; daily 1-3 a.m.
8.795 34.13	**HKV**	Ministerio de Guerra, Military Service, Bogota, Colombia, S.A. **Mon. and Thurs. news 7-7:30 p.m.**
8.665 34.62	**CD1K**	Finlay No. 3, Altos, Camaguey, Cuba. S—3 tone gong, each ¼ hr. English Ann. Each ½ hr. O: **"Allegiance March"** C—Nonc. Week days 10:30 a.m.-12:30 p.m. 7-10:30 p.m. Sun. 10 a.m.-12:30 p.m.
8.580 34.97	**YN1PR**	A Mejewsky, Gerente, Managua, Nicaragua, C.A. Daily 1-2:30 p.m.; 7:30-10:30 p.m. **Veri—5c U.S. postage.**
8.505 35.27	**YNLG**	Sr. Benjamin T. Gurranne, L., Managua, Nicaragua, C.A. Daily 1-2:30 p.m.; 7:30-9:45 p.m. **Veri—5c U.S. postage.**
8.404 35.70	**HC2CW**	Casilla 1166, Guayaquil, Ecuador, S.A. O-C: **Sangre Ecuatoriana.** Weekdays 11:30 a.m.-12:30 p.m.; 7-11 p.m. Sun. 3-5 p.m. **Veri—U. S. postage.**
8.110 37.00	**ZP1D**	Radio Prieto ZP10, Asuncion, Paraguay, S.A. Daily 8-10 p.m.
7.854 38.19	**HC2ISB**	P.O. Box 805, Guayaquil, Ecuador, S.A. S: Gong. O-C: **El Corcovado** (Carioca fox). Daily 9 a.m.-2 p.m.; 4-11 p.m. **Veri—U. S. postage.**
7.797 38.49	**HBP**	Geneva, Switzerland (see HBJ, 14.535 mc.) Saturdays 5:30-6 p.m.
7.550 39.74	**T18WS**	Apartado 75, Puntarenas, Costa Rica, C.A. Weekdays 5-7 p.m.; 8:30-10 p.m. Sun. 4-5 p.m.
7.510 39.95	**JVP**	Nazaki, Japan (see 21.520 mc.) 3-7:30 a.m. **Irregular.**
7.411 40.48	**HC1CE**	Apartado 485, Quito, Ecuador, S.A. Thursdays 9-10 p.m. **Veri—U.S. postage.**
7.380 40.65	**"Radio Liberte"**	Paris, France (see 9.523 mc.) Daily 7-8 p.m.
7.380 40.65	**XECR**	Secretaria de Relaciones Exteriores, Mexico, D.F. Sundays 6-8 p.m.
7.211 41.60	**EA8AB**	Radio Club Tenerife, Apartado 225, Santa Cruz, Tenerife, C.I. O-C: **Lady of Spain.** English on Saturdays only. Mon., Wed., Fri., Sat. 3:15-4:15 p.m.
7.203 41.64	**EAJ**	San Sebastian, Gomera, C.I. (see 10.370 mc.) Daily 4 p.m.-12 a.m. and later.
7.200 41.67	**YNAM**	A Majewsky, Gerente, Managua, Nicaragua, C.A. Daily 7-10 p.m. **Veri—5c U. S. Postage.**
7.177 41.80	**CR6AA**	Lobito, Portuguese West Africa (see 9.666 mc.) Wed. and Sat. 2:45-4.30 p.m.
7.100 42.25	**FD8AA**	Radio Club Oceanien, Alfred T. Poria, Pres., Papeete, Tahiti. Tues. and Fri. 11 p.m.-1 a.m.
7.030 42.67	**EA8AH**	El Coronel Jefe de Estado, de las Mayor de las Fuezas, Militares, Tetuan, Spanish Morocco, Africa. Daily 4-4:25 p.m.; 12-2:30 a.m. Irregular.
6.975 43.01	**HC6TC**	Apartado 134, Quito, Ecuador, S.A. Sat. and Mon. 7:45-9 p.m. **Veri—U. S. postage. Veri slow.**
6.900 43.48	**HI2D**	Asociacion cia Dominicana, Ciudad Trujillo, Dom. Rep., W.I. Daily 6:40-8:40 a.m.; 10:40 a.m.-2:40 p.m.; 4:40-8:40 p.m.
6.850 43.80	**TI0W**	P. O. Box 45, Port Limon, Costa Rica, C.A. Weekdays 10-11:30 p.m.; Sun. 2-3 p.m.
6.820 43.99	**XGOX**	Central Broadcasting Committee of Kuomintang, Nanking, China. Chinese except English 8:15 a.m. E.S.T. O-C: No regular selections. Weekdays 5:30-8:30 a.m. Sun. 7-9 a.m.
6.800 44.12	**HI7P**	Calle Jose Reyes No. 35, Ciudad Trujillo, Dom. Rep. W. I. Weekdays 12:40-1:40 p.m.; 6:40-8:40 p.m.; Sun. 9:40-10:40 a.m.
6.788 44.20	**PZH**	Paramaribo (Surinam), Dutch Guiana, S.A. Weekdays 2:45-4:45, 5:45-9:45 p.m. Sun. 9:45-11:45 a.m. **Veri slow.**
6.780 44.25	**HIH**	San Pedro de Macoris, Dom. Rep., W.I. Daily 12:10-1:40 p.m.; 7:40-9 p.m. Sun. 5:10-6:40 p.m. **DX 2:40-3:40 a.m.**
6.750 44.44	**JVT**	Nazaki, Japan (see 21.520 mc.) 4:30-7:30 a.m. **Irregular.**
6.730 44.58	**HI3C**	Sr. Roberto Palli, B., La Romana, Dom. Rep., W.I. English announcements regular. Weekdays 12:10-2:10 p.m.; 6:10-11 p.m. Sun. 12:10-2:40 p.m.
6.720 44.64	**PMH**	Bandoeng, Java N.E.I. (see PLP, 11.000 mc.) Daily 5:30-11 a.m.
6.690 44.84	**TIEP**	Apartado 227, San Jose, Costa Rica, C.A. Daily 7-11 p.m.
6.668 44.99	**HC2RL**	P. O. Box 759, Guayaquil, Ecuador, S.A. O-C: **Ecuadorian National Anthem.** English each 15 mins. Sunday 5:30-7:30 p. m.; Tues. 9-11 p.m. **Veri—U. S. postage.**
6.630 45.25	**HIT**	Apartado 1105, Ciudad Trujillo, Dom. Rep., W.I. O-C: **Anchors Aweigh.** English. Daily exc. Sun. 12:10-1:40 p.m.; 6:10-8:40 p.m. **DX 1st Sat. 11:10 p.m.-1:10 a.m.**
6.618 45.33	**El Prado**	Apartado 98, Riobamba, Ecuador, S.A. English ea. 15 mins. O: Bugle call. Thursday 9:15-11:15 p.m. **Veri—U. S. postage.**
6.580 45.59	**"Radio Guardia Civil"**	Tetuan, Spanish Morocco, Africa. O: March of the Caliph. C: **Spanish National Anthem.** I and S: chimes. Daily 2-3 p.m.; 7-8 p.m.
6.575 45.63	**HCIVT**	Ambato, Ecuador, S.A. Mon., Wed., Fri. 8-10:30 p.m. **Veri—U. S. postage.**
6.550 45.81	**TIRCC**	Apartado 1064, San Jose, Costa Rica, C.A. Tues. & Sat. 6-7 p.m., Thurs. 6-7 p.m., 8-9 p.m. Sun. 11 a.m.-1 p.m., 8-10 p.m.
6.545 45.84	**YV6RB**	Apartado 34, Ciudad Bolivar, Venezuela, S.A. Daily 7.10 p.m.; Sun. 3-6 p.m.
6.535 45.91	**YNIGG**	Managua, Nicaragua, C.A. Daily 6-10 p.m.; **Veri—5c U. S. postage.**
6.520 46.01	**YV4RB**	Valencia, Venezuela, S.A. C: Bugle call, taps and off. Daily 11 a.m.-1:30 p.m.; 5:30-9:30 p.m.
6.500 46.15	**HIL**	Apartado 623, Ciudad Trujillo, Dom. Rep., W.I. Daily 12-2 p.m.; 6-8 p.m.
6.500 46.15	**YVIRM**	Maracaibo, Venezuela, S.A. Daily 6-9:30 p.m.
6.482 46.28	**HI4D**	Ciudad Trujillo, Dom. Rep., W.I. Mon. & Sat. 11:55 a.m.-1:40 p.m.; 4:40-7:40 p.m.
6.480 46.30	**EDR-4**	Radio Poste, Palma de Mallorca, Balearic Islands. Daily 4:30-5:15 p.m.
6.479 46.30	**HI8A**	Apartado 1312, Ciudad Trujillo, Dom. Rep., W.I. English each 15 mins. O-C: March **General Alvaro Obregon.** S: 2 strokes of bell. Daily 8:40-10:40 a. m.; 2:40-4:40 p.m.; Sat. 9:10-10:40 p.m.
6.450 46.51	**HI4V**	Santiago Francisco de Macoris, Dom. Rep., W.I. Daily 11.40 a.m.-1:40 p.m.; 6:40-9:15 p.m.
6.445 46.55	**YVQ**	Gobierno de Venezuela, Maracay, Venezuela, S.A. 8-9 p.m. Saturdays.
6.420 46.73	**HIIS**	Santiago de los Caballeros, Dom. Rep., W.I. Daily 11:40 a.m.-1:40 p.m.; 5:40-7:40 p.m.
6.420 46.73	**YV6RC**	Ciudad Bolivar, Venezuela, S.A. Daily 10:30 a.m.-1:30 p.m.; 4:30-9:30 p.m.
6.410 46.80	**TIPG**	Apartado 225, San Jose, Costa Rica, C.A. O-C: **Parade of the Wooden Soldiers.** Daily 7:30-9:30 a.m.; 12-2 p.m.; 6-11:30 p.m.
6.400 46.88	**YV5RH**	Apartado 1931, Caracas, Venezuela, S. A. Weekdays 11 a.m.-1:30 p.m.; 4:30-9:30 p.m.; Sun. 9:30 a.m.-1:30 p.m.; 5-7:30 p.m.
6.375 47.10	**YV5RF**	Apartado 983, Caracas, Venezuela, S.A. C: Organ; **Blue Danube.** Daily 6:30-7:30 a.m.; 10:30 a.m.-1:30 p.m.; 4:30-10:30 p.m.
6.360 47.17	**YVIRH**	P. O. Box 261, Maracaibo, Venezuela, S.A. O: **Jealusie.** C: **Er Weicht der Sonne Nicht**—march. Weekdays 5:45-6:45 a.m.; 10:30-a.m.-1:30 p.m.; 3:30-10:30 p.m. English 10-10:30 p.m. Sunday 8:30 a.m.-2:30 p.m.
6.351 47.24	**HRPI**	Sr. Manuel E. Escota, Director, San Pedro Sula, Honduras, C.A. Weekdays 12-2 p.m.; 7:45-10 p.m. **Veri—5c U. S. postage.**
6.340 47.32	**HIIX**	Ciudad Trujillo, Dom. Rep., W.I. (see 15.280 mc.) Weekdays 12:10-1:10 p.m.; Tues. and Fri. 8:10-10:10 p.m.; Sun. 7:40-10:40 a.m.
6.330 47.39	**IZG**	Nazaki, Japan (see 21.520 mc.) **Irregular.**
6.330 47.39	**CDCW**	Apartado 130, Havana, Cuba. Daily 7 a.m.-12 midnight.
6.325 47.43	**HH3NW**	Port-au-Prince, Haiti, W.I. (see HH3W, 9.645 mc.) Weekdays 1-2 p.m.; 7-8:30 p.m.
6.316 47.50	**HIZ**	Calle Duarte No. 68, Ciudad Trujillo, Dom. Rep., W.I. Daily 11:30 a.m.-2:45 p.m.; 5:30-9 p.m.; Sat. to 10 and 11 p.m.
6.310 47.54	**TG2**	Director General of Electrical Communications, Guatemala City, Guatemala, C.A. **Irregular.** 11 p.m.-2 a.m. **No I.R.C. required.**
6.300 47.62	**YV4RD**	Sr. Luis Croquer, Prop., Maracay, Venezuela, S.A. Weekdays 6:30-9:30 p.m.
6.280 47.77	**CDHB**	P. O. Box 85, Sancti-Spiritus, Santa Clara, Cuba. Weekdays 9-10 a.m., 12-10 p.m. Sun. 10 a.m.-10 p.m.
6.280 47.77	**HIG**	Av. Jose Trujillo No. 20, Ciudad Trujillo, Dom. Rep., W.I. Daily 7:10-8:40 a.m.; 12:40-2:10 p.m.; 8:10-9:40 p.m.
6.275 47.81	**DAX4G**	Avda. Abancay, 915-923, Lima, Peru, S.A. C: **Good Night Sweetheart.** Daily 7-11:30 p.m.
6.270 47.85	**YV5RP**	P. O. Box 508, Caracas, Venezuela, S.A. Daily 6-11:45 p.m.
6.250 48.00	**YV5RI**	Sr. Edmundo Suegart, Prop., Caracas, Venezuela, S.A. Daily 5:30-9:30 p.m.
6.243 48.05	**HIN**	Calle Arzobispo Merino #97, Ciudad Trujillo, Dom. Rep., W.I. English each 15 mins. (see 12.500 mc.) Weekdays 11:40 a.m.-2:40 p.m.; 7:10-9:10 p.m. Sun 11:10 a.m.-3:40 p.m.
6.240 48.08	**HI8Q**	Julio O. Garcia Alardo, Ciudad Trujillo, Dom. Rep., W.I. **Daily 10:40** a.m.-1:40 p.m.; 4:40-8:40 **p.m.**
6.235 48.11	**HRD**	Sr. Tulio Castaneda, Director, La Ceiba, Honduras, C.A. English on the hour. **O: Solo Tuyo. C: Intermezzo No. 1.** Piano 10:58 p.m. **Good Night Melody. No signals.** Daily exc. Sun. 8-11 p.m.
6.230 48.15	**YVIRG**	Radio Valera, Valera, Venezuela, S.A. S: 1 bell O-C: Local March. Daily 11 a.m.-12:30 p.m.; 5:30-9:30 p.m.
6.210 48.31	**YVIRI**	Radio Coro, Coro, Venezuela, S.A. Daily 7:30-9:30 p.m.
6.200 48.39	**CDKG**	Apartado 137, Santiago, Cuba. Daily 5-6 p.m.; 9:30-10:30 p.m.; Sundays 12:01-1 a.m.
6.200 48.39	**XEXS**	Secretaria de la Economia Nacional, Mexico, D.F. Daily 7-11 p.m.
6.190 48.47	**HIIA**	P. O. Box 423, Santiago de los Caballeros, Dom. Rep., W.I. I: Gong, C: **Anchors Aweigh.** Daily 11:40 a.m.-1:40 p.m.; 7:40-9:40
6.170 48.62	**HJ3ABF**	Apartado 317, Bogota, Colombia, S.A. C: **Good Night Sweetheart.** Daily 11 a.m.-2 p.m.; 6-11 p.m.
6.160 48.70	**VPB**	Radio Club of Ceylon and So. India, P. O. Box 282, Colombo, Ceylon. S: Time on hour, 6 pips. I. Bow Bells, infrequently. Daily 7-9:30 a.m.; Saturdays to 12:30 p.m.
6.158 48.72	**YV5RD**	Radio Venezuela, Caracas, Venezuela, S.A. I: 5 strokes of bell. O-C: **Triunfo Aereo.** Weekdays 6:30-7:30 a.m.; 10:30 a.m.-1:30 p.m.; 3:30-10 p.m. Sun. 8:30 a.m.-10:30 p.m.
6.150 48.78	**HJ4ABU**	Pereira, Caldas, Colombia, S.A. No English. Official march **El Hombre Payaso.** C: **Overture-chorus voices.** No signals. Daily 9:30 a.m.-12 noon; 6:15-10 p.m.
6.150 48.78	**CIRD**	Winnipeg, Manitoba, Canada (see CJRX, 11.270 mc.) Weekdays 6.30-11 p.m. Sundays 5-10 p.m.
6.150 48.78	**HI5N**	Moca, Dom. Rep., W.I. Daily 6:40-8:40 a.m.; 10:40 a.m.-2:40 p.m. 4:40-8:40 p.m.
6.150 48.78	**DAX1A**	Sr. J. Carlos Montjoy D., Casilla No. 9, Chiclayo, Peru. Daily exc. Sat. 8-11 p.m.; Sat. 8 p.m.-12 a.m.
6.140 48.86	**W8XK**	Pittsburgh, Pa. (see 21.540 mc.) Daily 10 p.m.-1 a.m.
6.140 48.86	**ZEB**	Bulawayo, Rhodesia, South Africa (see ZEC, 5.800 mc. for address). Sun. 3-5 a.m.; Tues. and Thurs. 1:15-3:15 p.m.
6.138 48.88	**HI4ABD**	Sr. Luis Emiro Mejia, Gerente, Medelin, Colombia, S.A. O-C: Part 4a **William Tell** (see 5.900-5.780 mc.) Weekdays 10 a.m.-2 p.m.; 4-11 p.m. Sun. 11 a.m.-3 p.m.; 7-11 p.m. **Veri slow.**
6.137 48.88	**CR7AA**	P.O. Box 594, Lourenco Marques, Portuguese East Africa. **O: A Maria de Fonte. C: A Portuguesa.** Weekdays 12:15-1 a.m.; 4:30-6:30 a.m.; 9:30-11 a.m.; 12:30-4 p.m. Sundays 5-7 a.m.; 10 a.m.-12:30 p.m.; 2-4 p.m.
6.133 48.91	**XEXA**	Mexico, D.F. (see 11.880 mc.) Weekdays 8:30-11 a.m.; 2:30-4:30 p.m.; 7 p.m.-12 a.m. Sunday 11 a.m.-2 p.m.; 5-10 p.m.
6.130 48.94	**VP3BG**	Crystal Broadcasting Co., Philharmonic Bldgs., Georgetown, British Guiana, S.A. **O: Serenade. C: Good Night My Love and God Save The King.** Week-days 10:15-11:15 a.m. 3-7:45 p.m. Sundays 6:45-8:45 a.m.; 4:45-6:45 p.m. **Veri slow.**
6.130 48.94	**ZGE**	Kuala Lumpur, Malaya States, S.S. Sun., Tues., Fri. 6:40-8:40 a.m.
6.130 48.94	**LKII**	Jeloy, Norway (see 9.530 mc.) Daily 11 a.m.-5 p.m.
6.130 48.94	**CDCD**	P.O. Box 2294, Havana, Cuba. English each 15 mins. O: **In a Clock Store.** C: **Good Night.** Weekdays 9 a.m.-1 a.m. Sundays 1-3 a.m. **DX 10 a.m.-8 p.m.**

Mc. & M.	Call	Location & Schedule
6.130 48.94	VE9HX	P.O. Box 998, Halifax, N. S., Canada. O-C: **Oh Canada.** Chimes 15 min. periods. Sun. 3:55-9:45 p.m. Mon. to Fri. 6 a.m.-9-45 p.m. Sat. 10 a.m.-9:45 p.m.
6.128 48.96	HJ1ABB	Apartado 715, Barranquilla, Columbia, S.A. 1: 3 chimes. S: 1 chime between advertisements. C: **La Golondrina.** Daily 11:45 a.m.-1 p.m.; 5:30-10 p.m. **Veri slow.**
6.125 48.98	CXA4	Mercedes 823, Montevideo, Uruguay, S.A. Daily 8 a.m.-12 noon; 2-10 p.m.
6.122 49.00	HP5H	Voice of the People, Panama City, Panama, C. A. Daily 7-10 p.m.
6.122 49.00	HJ3ABX	Apartado 26-65, Bogota, Colombia, S.A. Weekdays 10:30 a.m.-2 p.m.; 5:30-11:30 p.m. Sundays 12-1:30 p.m.; 6-11 p.m.
6.120 49.02 ◆	XEFT	Vera Cruz, Mexico (see 9.550 mc.)
6.120 49.02 ◆	W2XE	Wayne, N. J. (see 21.520 mc.)
6.120 49.02	XEUZ	F. J. Stavoli, Chief Eng'r., Radio Nacional, Mexico, D.F. S: 5 bells (chimes) O-C: **Marcha Dragona.** Daily 10 a.m.-1 p.m.; 7 p.m.-2 a.m. **DX 1-2 a.m.**
6.115 49.06	OLR2C	Prague, Czechoslovakia (see 21.450 mc.) S: Bells. **Irregular** (see 15.230-11.840 mc.)
6.110 49.10	HJ4ABB	Apartado 175, Manizales, Colombia, S.A. Daily 11 a.m.-1 p.m.; 5-8 p.m. **Veri slow.**
6.110 49.10 ● ◆	GSL	Daventry, England (see 26.100 mc.)
6.110 49.10	XEPW	Enrique Arzamendi, Gen'l. Mgr., Mexico, D.F. S: 5 chimes of gong. O-C: **Vall a dolid Azteca** march. Daily exc. Mondays 11 a.m.-4 p.m.; 7 p.m.-12 a.m. Mondays 9 a.m.-4 p.m.
6.109 49.10	VUC	1 Garstin Place, Calcutta, India. S: none. C: **God Save The King.** Daily 8 a.m.-12:30 p.m. 11 p.m.-12:30 a.m.
6.100 49.18	YUA	Director, Bureau Central de Presse, Belgrade, Yugoslavia. S: Short tune on flute. O-C: National Anthem. Daily 12:45 a.m.-6 p.m.
6.100 49.18	W9XF	20 N. Wacker Drive, Chicago, Ill. O-C: **Star Spangled Banner.** Daily 5-8:05 p.m., 12:05-1 a.m.
6.100 49.18	W3XAL	Bound Brook, N. J. (see 17.780 mc.) Daily 9:15 p.m.-1 a.m.
6.097 49.20	ZTJ	African Broadcasting Co., Inc., P.O. Box 4559, Johannesburg, South Africa. Physical session. O: Bugles—**Reveille.** C: **Cook House.** 1: chimes. C: **God Save The King.** Sun. 4-5 a.m.; 12:15-3:15 p.m. Weekdays 12-12:45 p.m.; 3:15-5 a.m. and 9 a.m.-4 p.m.
6.097 49.94	"Radio Burma"	Burma Independent Wireless, Rangoon, Burma. C: **God Save the King.** Daily 9:10-9:40 a.m.
6.097 49.20	HJ4ABE	Medellin, Colombia S. A. I: Morse letter **"M."** S: 4 chimes. Daily 9:30 a.m.-1 p.m.; 5-11:30 p.m.
6.095 49.22	JZH	Nazaki, Japan (see 21.520 mc.) **Irregular.**
6.092 49.24	OAX4Z	Lima, Peru (see OAX4T, 9.562 mc.) Daily 7-11:30 p.m.
6.090 49.26 ●	CRCX	Bowmanville, Ont., Canada (see 24.380 mc.) Weekdays 12-8 p.m.; Sun 11 a.m.-8 p.m. Sat. **Northern Messenger** 11 p.m.-12 a.m.
6.090 49.26	ZBW-2	Hong Kong, China (see 9.525 mc.)
6.090 49.26	HJ4ABC	Ibague, Colombia, S.A. Daily 6-11 p.m.
6.085 49.30	HJ5ABD	Cali, Colombia, S.A. Daily 11 a.m.-2 p.m.; 6-11 p.m.
6.082 49.33	VQ7LO	P.O. Box 777, Nairobi, Kenya Colony, Africa. English used. C: **God Save The King.** Time signal 6 pips on hour. Daily exc. Sunday 5:30-6 a.m. Daily 11:15 a.m.-2-15 p.m. Tues. and Thurs. 8:15-9-15 a.m.
6.080 49.34	W9XAA	Chicago, Ill. (seo 17.780 mc.) Week days 7:30-9 a.m., 6 p.m.-1 a.m. Sun. 11 a.m.-1 p.m., 6 p.m.-1 a.m.
6.080 49.34	ZHJ	Penang Wireless Society Headquarters, 40 Perak Road, Penang, S.S. Daily 6:40-8:40 a.m.
6.080 49.34	CP5	La Paz, Bolivia, S.A. (see CP7, 15.300 mc.) **Irregular.**
6.080 49.34	VE9CS	743 Davie St., Vancouver, B.C., Canada. O: **O Canada:** C: **God Save The King.** S: 3 strokes gong. Sun. 12 noon-1:30 a.m. Mon., Thurs., Sat. 9:30 a.m.-8:30 p.m. Tues., Wed., Fri. 9:30 a.m.-2:30 a.m.
6.080 49.34	HP5F	Hotel Carlton, Colon, Panama, C.A. Weekdays 11 a.m.-1 p.m.; 7-10 p.m.; Sun. 10:45-11:30 a.m. 7-10 p.m.
6.079 49.35	DJM	Zeesen, Germany (see 17.760 mc.) **Irregular.**
6.075 49.38	XECU	Hidalgo 579, Guadalajara Jab., Mexico. O-C: **Ojos Tapatious.** I: Train in motion. Daily 9-11 a.m.; 1-4 p.m.; 8-11:30 p.m. or 12a.m.
6.070 49.42	YVIRD	P. O. Box 100, Maracaibo, Venezuela, S. A. Daily 8 p.m.-12 a.m.
6.070 49.42	CFRX	37 Bloor St., West, Toronto, Ontario, Canada. Daily exc. Sun. 6:30 a.m.-11 p.m.; Sun. 9:30 a.m.-11 p.m.
6.065 49.46	XEXR	Departamento Autonomo de Propaganda y Publicidad, Mexico, D. F. Daily 6-11:30 p.m.
6.065 49.46	SBO	Motala, Sweden (see 11.705 mc.) Daily 4-5 p.m.
6.060 49.50	W8XAL	Crosley Radio Corp., Cincinnati, Ohio. Weekdays 6:30 a.m.-8 p.m.; 11 p.m.-2 a.m.
6.060 49.50	W3XAU	Philadelphia, Pa. (see 9.590 mc.) Daily 7-10 p.m.
6.060 49.50	OXY	Statsradiofonien, Heibergsgade 7, Copenhagen, Denmark. O: one gong stroke. C: **There Is a Winsome Land.** Weekdays 1-6:30 p.m. Sun. 11 a.m.-6:30 p.m.
6.050 49.59 ● ◆	GSA	Daventry, England (see 26.100 mc.)
6.050 49.59	HJ3ABD	Apartado 509, Bogota, Colombia, S. A. O: **Para Ti Rio Rita.** C: **Rio Rita** and National Anthem. Week-days 9 a.m.-2 p.m.; 6 p.m.-12 a.m. Tues. and Thurs. to 3 p.m. Wed. and Fri. begin 5:30 p.m.
6.050 49.59	XEXF	Secretaria de la Economia Nacional, Mexico, D. F. Daily 8 p.m.-12 a.m.
6.045 49.62	XETW	Francisco I. Madero, 10, Tampico, Mexico. Daily 7 p.m.-12 a.m.
6.043 49.62	HJ1ABG	Apartado 674, Barranquilla, Colombia S. A. Daily 11 a.m.-11 p.m.; Sun. 11 a.m.-8 p.m.
6.040 49.67	YDA	Tandjong Priok, Jara N. E. I. (see 15.150 mc.) Daily 10:30 p.m.-2 a.m.
6.040 49.67	W4XB	Herald Bldg., Miami, Fla. **In service again before Sept. 15.**
6.040 49.67	WIXAL	Boston, Mass. (see 21.460 mc.) **Irregular**
6.030 49.75	OLR2B	Prague, Czechoslovakia (see 21.450 mc.) **Irregular.** (see 15.230-11.840 mc.)
6.030 49.75	HP5B	P.O. Box 910, Panama City, Panama. English and Spanish. C: **A Happy Good Night and Good Night Sweetheart.** Daily 11:30 a.m.-1 p.m.; 5-10 p.m.
6.030 49.75	HJ4ABP	Emisora Philco, Medellin, Colombia, S.A. Daily 8 a.m.-11 p.m.
6.030 49.75	VE9CA	Toronto General Trust Bldg., Calgary, Alberta, Canada. C: **Lights Out.** S: None. Weekdays 9 a.m.-1 a.m. Thurs. to 2 a.m. Sun. 12 noon-12:30 a.m.
6.030 49.75	XEBQ	Astillero 35, Mazatlan, Mexico. Daily 8-11:30 p.m.
6.025 49.79	HJ1ABJ	Santa Marta, Colombia, S.A. Daily 11:30 a.m.-2 p.m.; 5:30-10:30 p.m.
6.020 49.83	DJC	Zeesen, Germany (see 17.760 mc.) Daily 11:35-4:30 p.m.
6.020 49.83	XEUW	Av. Independencia 98, Vera Cruz, Mexico. S: Marimba. O: March **Victoria.** C: **La Golondrinas.** Daily 8 a.m.-12 midnight.
6.015 49.88	HI3U	Apartado 23, Santiago de los Caballeros, Dom. Rep., W.I. O-C: Organ **Maria My Own.** Weekdays 7:10-8:40 a.m.; 10:40 a.m.-1:40 p.m.; 4:40-9:40 p.m. Sun. 10:40 a.m.-1:40 p.m. only.
6.015 49.88	XEWI	Mexico, D.F. (see 11.900 mc.) **Irregular.**
6.012 49.90	HJ3ABH	Apartado 565, Bogota, Colombia, S.A. I: 3 chime notes. Weekdays 11:30 a.m.-2 p.m.; 6-11 p.m. Sun. 12-2 p.m.; 4-11 p.m.
6.010 49.92	VP3MR	16, Robb and Hincks Sts., Georgetown, British Guiana, S.A. Weekdays 4:45-8:45 p.m.; Mon., Wed., Fri. 10:15-11:15 a.m. Sun. 8:45-11:15 a.m.
6.010 49.92	VK9MI	M. V. Kanimbla, Sydney, Australia (see 11.710 mc.) 11 p.m.-8 a.m. and later.
6.010 49.92	COCO	P.O. Box 98, Havana, Cuba. English and Cuban. Daily 8 a.m.-10 p.m.
6.010 49.92	OLR2A	Prague, Czechoslovakia (see 21.450 mc.) **Irregular** (see 15.230-11.840 mc.)
6.005 49.96	HP5K	P.O. Box 33, Colon, Panama, C.A. S: 3 chimes, ea. 15 m. O-C: **Merry Widow Waltz.** Daily exc. Sun. 7-9 a.m.; 11:30 a.m.-1 p.m.; 6-11 p.m. Sun. 10 a.m-12 a.m.
6.005 49.96	CFCX	P.O. Box 1690. Montreal, Quebec, Canada. Weekdays 6:44 a.m.-12 midnight. Sundays 8 a.m.-10:15 p.m.
6.005 49.96	VE9DN	Montreal, Quebec, Canada (see CFCX, 6.005 mc.) Sat. 11 p.m.-12 a.m. Fall, winter and spring.
6.000 50.00	CXA2	Rio Negro, Montevideo, Uruguay, S.A. O: **Voluntary Trumpeter.** C: **Good Night Melody.** Daily 10:30 a.m.-10:30 p.m.
6.000 50.00	HJ1ABC	Sr. Rafel Valencia Ibanez, Quibdo, Colombia, S.A. O-C: March, **Relator.** S: 2 blows Chinese gong. Sun. 3-5 p.m. Wed., Sat. 5-6 p.m. Daily 6-9 p.m.
6.000 50.00	XEBT	P.O. Box 79-44, Mexico, D.F. I: 3 blasts on cookoo horn. Siren near closing. O: **Las Mananitas.** C: **Liebestraum.** Daily 10 a.m.-1 a.m.
6.000 50.00	FIQA	Director of Posts and Telegraphs, Tananarive, Madagascar. Daily 12:30-12:45 a.m.; 3:30-4:30 a.m.; 10-11 a.m.
6.000 50.00 ◆	RV59	Moscow, U.S.S.R. (see RKI, 15.040 mc.) **No I.R.C. required.**
5.980 50.17	HJ2ABD	Calle 2 No. 1205, Bucaramanga, Colombia, S.A. Daily 11:30 a.m.-12:30 p.m.; 6-10 p.m.
5.969 50.26	HVJ	Vatican City (see 15.121 mc.) 2-2-15 p.m. Sun. 5-5:30 a.m.
5.955 50.35	HJN	Minister of Education Nacional, Bogota, Colombia. Daily 11 a.m.-2 p.m.; 5-10:30 p.m.
5.940 50.51	TG2X	De la Policia Nacional, Guatemala City, Guatemala, C.A. Daily 4-6 p.m. Mon., Thurs., Sat. 10-11:30 p.m. Sundays 1-2 p.m. **No I.R.C. required.**
5.930 50.59	PJCI	Curacaoschie Radio Vereeniging, Willemstad Curacao, N.W.I. O: Electrical gong, 4 strokes and repeat 5 mins. O-C: National anthem. Weekdays 6:36-8:36 p.m. Sun. 10:36 a.m.-12:36 p.m.
5.930 50.59	YVIRL	P.O. 247, Maracaibo, Venezuela, S.A. Weekdays 11 a.m.-1 p.m.; 4:30-9:30 p.m. Sun. 8:30 a.m.-2:30 p.m.
5.910 50.76	YV4RH	Valencia, Venezuela, S.A. Daily 8-11:30 p.m.
5.910 50.76	HH2S	Port-au-Prince, Haiti, W.I. (see 11.570 mc.) Daily 7-10 p.m.
5.905 50.80	TILS	P.O. Box No. 3, San Jose, Costa Rica, C.A. S: none. O: **Washington and Lee Swing.** C: **Adios Mi Chapparrita.** Weekdays 12-3 p.m.; 6-11 p.m. Sundays irregular.
5.900 50.84	ZNB	Government Engineer, Mafeking, South Africa. Mon. to Fri. 1-2:30 p.m. Sun. 1:30-2:30 p.m.
5.900 50.85	HJ4ABD	Medellin, Colombia, S.A. (see 6.138-5.780 mc.) Weekdays 10 a.m.-2 p.m.; 4-11 p.m. Sun. 11 a.m.-3 p.m.; 7-11 p.m. **Veri slow.**
5.885 50.98	HI9B	P.O. Box 95, Santiago de los Caballeros, Dom. Rep., W.I. O-C: Piano Solo—**Vals Evocacion.** Weekdays 7:25-8.40 a.m.; 11:55 a.m.-2:10 p.m.; 4:55-7:40 p.m. Sundays 11:40 a.m.-2:40 p.m.
5.880 51.02 ●	YV3RA	Barquisimeto, Venezuela (see YV3RB, 9.565 mc.) Daily 11:30 a.m.-12:30 p.m.; 5:30-9:30 p.m.
5.875 51.11	HRN	Tegucigalpa, Honduras, C.A. C: **Good Night Melody (Ted Lewis.)** Daily 7-10 p.m. **Veries—100 U.S. cash. Veri slow.**
5.865 51.15	HIIJ	Apartado 204, San Pedro de Macoris, Dom. Rep., W.I. O-C: Waltz, **Sweet Remembrance.** English very seldom. S: none. Daily 11:40 a.m.-1:40 p.m.; 5:40-9:40 p.m.
5.850 51.28	YVIRB	P.O. Box 37, Maracaibo, Venezuela, S.A. English and Spanish. O-C: **Strike Up The Band.** Daily exc. Sun. 10:45 a.m.-12:45 p.m.; 4:45-9:45 p.m. Sun. 8:45 a.m.-9:45 p.m.; Mon., Wed., Fri. 5:45-8:15 a.m. Tues., Thurs., Sat. 5:45-9:45 a.m.
5.830 51.46	TIGPH	**Apartado 800, San Jose, Costa Rica, C.A. C: Good Night Melody** (Ted Lewis). Weekdays 8-11 p.m.
5.800 51.72	YV5RC	P.O. Box 2009, Caracas, Venezuela, S.A. 1: 4 chimes. O-C: **Official IBB March.** Bugles, whistles before closing. Daily exc. Sun. 7-8 a.m.; 10:45 a.m.-1:45 p.m.; 3:45-9:30 p.m. Sunday 8:30 a.m.-10:30 p.m.
5.800 51.72	ZEC	P.O. Box 792, Salisbury, Rhodesia, South Africa. Sun. 3-5 a.m.; Tues. and Fri. 1:15-3:15 p.m.
5.780 51.90	OAX4D	All American Cables, Ltd., Casilla 2336, Lima, Peru, S.A. Signs on and off Morse code. No signals. English and Spanish. Wed., Sat. 9-11:30 p.m.
5.780 51.90	HJ4ABD	Medellin, Colombia, S.A. (see 6.138-5.900 mc.) Weekdays 10 a.m.-2 p.m.; 4-11 p.m. Sun. 11 a.m.-3 p.m.; 7-11 p.m. **Veri slow.**
5.758 52.10	YNOP	Radio Bayer, Managua, Nicaragua, C.A. Weekdays 8:30-10:30 p.m. **Veri—5c U. S. Postage.**
5.755 52.13	YV2RA	San Cristobal, Venezuela. English each 15 mins. S: 6 strokes gong. O-C: March, **El Capitan.** Weekdays 11:30 a.m.-12:30 p.m.; 5:30-9 p.m. Sun. 5:30-10 p.m.
5.725 52.40	HCIPM	P.O. Box 664, Quito, Ecuador, S.A. O-C: **La Marcha de Aida.** Saturdays 9-11 p.m.
5.713 52.51	TGS	Casa de Presidencial, Guatemala City, Guatemala, C.A. Sun., Wed., Fri. 6-8 p.m. No I.R.C. needed.

(Continued on page 545)

Queries

A BEGINNER'S TRANSMITTER . . . BCL INQUIRY . . . FIVE-METER RECEPTION.

THE primary purpose of the Queries Department is to solve the technical and semi-technical problems of our readers who feel they require such assistance. However, questions, so long as they are related to radio, need not be of a technical nature. ¶Every question will be answered personally, by mail. A self-addressed and stamped envelope should be included. ¶In questions concerning specific apparatus, it will be of considerable assistance to our technicians if the inquiry is accompanied with a wiring diagram, original operating instructions, and all relevant literature. While it is the desire of this department to be of assistance in all possible instances, it should be borne in mind that the manufacturer will occasionally be in a position to give better advice concerning his own product, and usually maintains a technical department at the service of those who purchase his equipment.

Question No. 41: Having recently acquired a Class B ticket, I built up a simple transmitter using a 6L6G tube as described in one of the handbooks. The transmitter is crystal controlled and operates—or rather should operate—in the 80-meter band. However, I have been unable to make it operate satisfactorily, even though I have tried variations of the circuit. While the circuit will oscillate feebly without load, the moment the antenna is connected, the transmitter either refuses to oscillate or does so with poor keying and a decided chirp. The tube tests okay—in fact is better than the average run, as it was selected from a group of six.—*A. W. P., Binghamton, N. Y.*

Answer The chances are the trouble is a poor crystal. Many beginners try to save money on crystals. It is poor economy, as only the best crystal will give really satisfactory service. This is particularly true in the case of simple transmitters where the maximum of power must be taken directly from the crystal-controlled oscillator. We suggest that A. W. P. borrow several crystals and note if there is any difference in operation.

If other crystals do not give better results, the crystal may be exonerated, and the trouble is probably due to too close coupling between the antenna and the plate tank circuit. A. W. P. does not say how the power is being transferred to the antenna, but the most simple method is by means of a twisted transmission line feeding the center of a half-wave doublet. The transmission line is coupled to the plate coil by means of a fraction of a turn to several turns of wire.

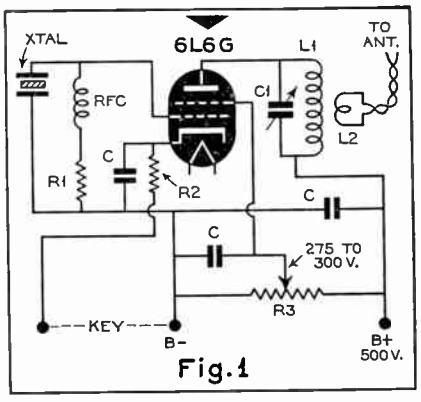


Fig. 1

This simple transmitter has worked well in the AWR lab. Values—C, 0.1 mfd.; R1, 10,000 ohms; R2, 200 ohms; R3, 20,000 ohms, 50 watts; RFC, 2.5 to 3 mh.

Many of the commercially made tank coils incorporate a two-turn coupling link. This is quite all right for link coupling to a succeeding amplifier circuit, but is usually considerably too much for coupling directly to the antenna transmission line. With excess coupling, the circuit will not oscillate. At critical coupling, the circuit will oscillate, but the keying will lag, and the signal will have a pronounced chirp. Coupling should be loosened until keying is perfect and the signal is devoid of chirp. Sometimes less than three-quarters of a turn must be used.

This applies only when the antenna is being coupled directly to the crystal-controlled oscillator. When coupled to an amplifier tank coil, more turns may be used. In fact occasionally four to five turns may be necessary to load the finals so that they draw their rated power.

A.W.R. has found the most reliable of the simple 6L6G circuits to be that shown in Fig. 1. The data on C1 and L1 for the different bands can be secured from any of the handbooks. Coil L2 will be from ½ to 2 turns, depending upon the diameter of L1 and the proximity. The other values are given in the caption.

L2 is connected to the antenna by the transmission line, which may be any convenient length of Lynch Giant Killer Cable, Birnbach EO-1 cable or Bassett Concentric Feeder. The antenna is shown in Fig. 2. As a half-wave 80-meter doublet L plus L will equal 133 feet. For 40 meters L plus L should be 66 feet. However, a convenient "compromise antenna" will have a total length of 102 feet. This will work equally well on 80 and 20 meters, and by use of a doubler stage, which can be the beginner's next logical step, plenty of DX 20-meter QSOs can be had.

✦

Question No. 42: Would you kindly tell me how the large radio networks such as CBS, NBC and Mutual put dance orchestras over the air? There has been much discussion in the sanatorium where I am as to whether the night clubs and the hotels pay the networks for advertising the place where the orchestra is located, or whether the chains put it on free.—*O. S., Re Ell, Washington.*

Answer: The hotels and night clubs pay the line charges—and of course their own

(Continued on page 558)

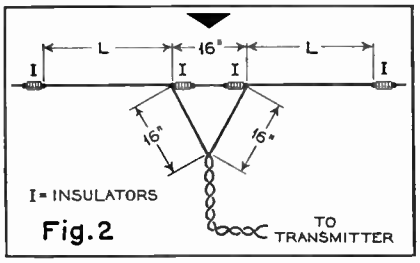


Fig. 2

A recommended antenna for the simple c.w. transmitter shown in Fig. 1.

S.W. BROADCAST LIST

(Continued from page 543)

5.140 58.37	PMY	Nillmy Bldg., Bandoeng, Java, N.E.I. O: March, Le Rene Passe. C: On chimes, Good Night and National Anthem. Daily 4:45-10:45 a.m.; 3:45 p.m.-2:15 a.m.
4.810 62.37	YDE2	Solo, Java, N.E.I. (see 15.150 mc.) Daily 5:30-11 a.m.; 5:45-6:45 p.m.; 10:30 p.m.-2 a.m.
4.600 65.22	HC2ET	P.O. Box 824, Guayaquil, Ecuador, S.A. I: 12 chimes. Wed. and Sat. 9:15-10:45 p.m. Veri U. S. postage.
4.420 67.87	ZMBJ	Wellington, N. Z. (see 13.600 mc.)
4.273 70.21	RV15	Radio Committee, Khabarovsk, U.S.S.R. English, 2 a.m., EST and at announcements. Daily exc. 6th 12-18-24-30th 3 p.m.-8 a.m. On 6-12-18-24-30th 7:10 p.m.-8 a.m. English programs start at 2 a.m. No I.R.C. necessary.
4.107 73.05	HCJB	Quito, Ecudaor, S.A. (see 8.948 mc.)
4.002 75.00	CT2AJ	Ponta Delgada, Island of St. Michael, Azores. Wed. and Sat., 5-7 p.m.
3.750 80.00	HCK	Quito, Ecuador, S.A. Mon 8:30-10:30 p.m. Veri—U. S. postage.
3.040 98.68	YDA	Batavia, Java, N.E.I. (see 15.150 mc.) Sun. 5:30-10:30 a.m.; 7:30 p.m.-2 a.m Weekdays 5:30-10:30 or 11 a.m. (Sat. 11:30 a.m.), 6-7:30 p.m.; 10:30 p.m.-2 a.m.

FOREIGN BROADCAST LIST

(Continued from page 539)

—	Seraing, Belgium	100
—	Vellereille, Belgium	100
—	Verviers (No. 1), Belgium	100
—	Verviers (No. 2), Belgium	100
CB150	Santiago, Chile	10000
CJIC	S. STE. MARIE, ONT.	100
CMCN	HAVANA, CUBA	100
EAJ50	Las Palmas, Canary Islands	250
ON4EX	Liege, Belgium	150
ON4FC	Liege, Belgium	150
VUP	Peshavar, India	250
XHHT	Shanghai, China	100
XOCL	Tsinan, China	200
XQHG	Shanghai, China	250
YV1RA	Maracaibo, Venezuela	200
2BS	Bathurst, Australia	100
3AK	Melbourne, Australia	200
1510 KC		
—	Jankoping, Sweden(5)	200
—	Karlskrona, Sweden(5)	200
CFRC	KINGSTON, ONT.	100
CKCR	WATERLOO, ONT.	100
TG-1	Guatemala City, Guat.	300
YDA8	Transjongpriak, Java	500

EDITORIAL QUOTES

(Continued from page 508)

tion the listener may not be able to hear at all.

If the report is to be complete, state the frequency on which the transmission was heard, local weather conditions, and data on your receiver and antenna system.

If you have been lax in the past, try sending through a real report. You'll find in most instances that the Ham receiving it will return the courtesy.

5-METER NET

(Continued from page 516)

service station with minimum power of 20 watts and a location which permits contact with at least one other member. Duplex operation and i.c.w. are not permitted, with the exception in the latter case of members selected for the transmission on i.c.w. of code lessons for 5-meter listeners interested in obtaining ham licenses.

Amateurs interested in joining the Interstate 5-Meter Net, and listeners wishing to obtain the code lesson schedules, should communicate with Mr. Felix P. Nierodzik, W2HUT, 478 Dean St., Brooklyn, N. Y.

R.S.S.L. NEWS

(Continued from page 535)

line or in industrial equipment in your vicinity, pay a visit to the local power company, as they will more than likely assist you in tracking down the noise source. Most power companies are equipped with noise-locating devices.

Locating Noise

If you undertake the task yourself, most any type of portable or mobile radio receiver will suffice as a noise locator. As you approach the source of disturbance the noise level will increase in the receiver and, of course, decrease as you move away from the source.

If an auto-radio receiver is employed as the noise locator, the a.v.c. action should be temporarily put out of commission by grounding the a.v.c. bias feed line to the receiver chassis.

A simple battery-operated receiver consisting of a regenerative detector and one stage of audio will serve very nicely as a noise locator. The components should preferably be mounted in a metal cabinet, along with the batteries.

No matter what type of receiver is employed, it is preferable to use headphones and a vertical rod antenna. The volume control should be turned up only far enough to bring the noise within the range of audibility. As the source of the noise is approached, and it becomes louder, the volume control should be turned back so that the noise is always at a comparatively low level.

It is suggested that League members residing in the same locality band together for the purpose of conducting noise surveys. A survey of this sort is hardly a one-man job, and it cannot be accomplished in a day.

In instances where sources of industrial noise interference have been definitely established and representations to the company involved bring no satisfaction, a full report of the conditions should be submitted to the Director of the Noise Survey Division of the League who will in turn report the matter to the proper authorities.

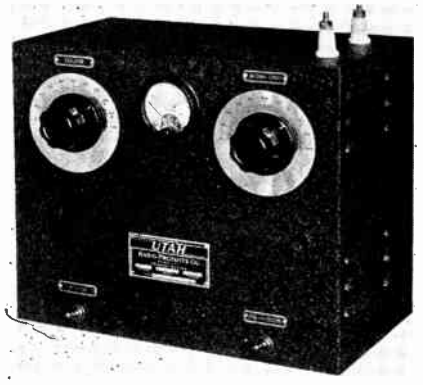
Data on noise interference legislation adopted by a number of cities and states will be presented in an early issue.

(Continued on page 547)

ON THE MARKET

C. W. JUNIOR XMTTR KIT

UTAH RADIO PRODUCTS CO., Chicago, Ill., have placed on the market an inexpensive C.W. Junior Transmitter Kit having an output of 25 watts—plenty of power to really get out and make dx contacts. The complete r.f. unit and its self-contained power supply fit in a neat and compact one-piece ventilated metal case, with crackle finish, measuring 12"x7"x11".



As shown in the front view illustration, controls are provided for tuning the oscillator and antenna circuits, and a milliammeter for determining resonance. An On-Off switch is located in the lower left corner, and a Send-Receive switch in the lower right corner.

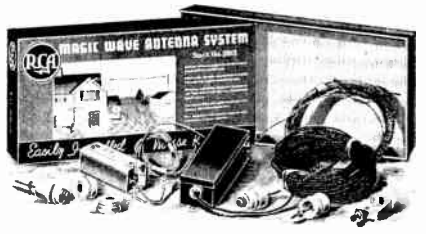
A type 6L6 beam-power tube is used in the oscillator circuit which is crystal controlled. The power supply employs a 5W4 rectifier tube. The 6L6 is used as a harmonic oscillator with the result that all bands can be covered with but two crystals, and with only one coil to change for each band used.

As shown in the rear view, the power-supply chassis is mounted in the lower part of the case, with the r.f. unit directly above. Good engineering design has resulted in a powerful and stable transmitter using the minimum number of components without any sacrifices in operating qualities. ALL-WAVE RADIO.

RCA MAGIC WAVE ANTENNA

The ease with which this new antenna may be installed and its flexibility, as well as its ability to separate signals from noise are said to be the main factors contributing to its success. Aside from the advantages which commend the Magic Wave antenna for use in the home is the fact that it is especially applicable for store demonstration use. With the addition of only a distribution transformer and an extra receiver-coupling transformer for each additional receiver, radio dealers may operate up to four sets efficiently from a single antenna.

The complete system consists of an antenna proper which may be of any practical length, an antenna-to-transmission line



coupling unit, a transmission line and a line-to-set coupling unit. Each of the coupling units has two magnetite core transformers, one responding most efficiently over the standard broadcast band, and the other over the short-wave bands.

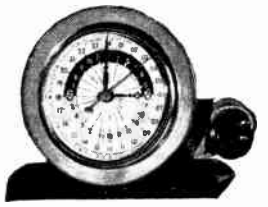
An advantage of the RCA Magic Wave antenna is its unusual adaptability. The antenna may be a single wire L type of any length from 20 to 120 feet, or a vertical signal collector made of several lengths of ordinary iron pipe. It may be installed with equal ease on apartment houses and homes, either as a complete installation or as a connection to an existing antenna. No doublets or transmission line of critical length are required. The transmission line may even be buried in the ground—a desirable feature, especially if a vertical signal collector is used. ALL-WAVE RADIO.

◆

NEW WORLD-WIDE CLOCK

DX'ERS HAVE BEEN waiting a long time for this practical addition to station equipment. Here is a clock that gives the time, at a glance, for all of the 24 time zones around the globe. The new World-Wide clock just announced by the Gordon Specialties Company, Chicago, makes it easy for hams and DX listeners to maintain accurate schedules without referring to time charts or relying on guess-work.

The attractively colored 24-hour dials are plainly marked with GMT and standard time scales, which also directly tell the local standard time in principal countries and cities around the world as follows: Los Angeles (U. S. Pacific Standard Time), Denver (U. S. Mountain Standard Time), Chicago (U. S. Central Standard Time), New York City (U. S. Eastern Standard Time), Buenos Aires (Colonial Standard Time), Rio de Janeiro, Azores, Canary Islands, London, Berlin, Moscow,



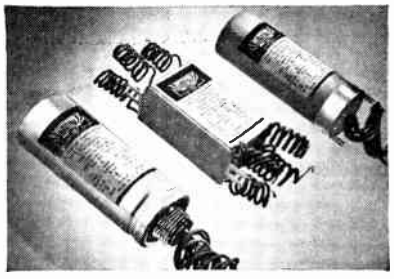
Bagdad, Persia, Bombay, Calcutta, Singapore, Manila, Tokyo, Sydney, New Zealand, International Date Line, Hawaii, Fairbanks, and Juneau. A small center dial, marked with these locations, rotates with the hour hand. The clock is also equipped with a second hand. The Waltham movement is self-starting and operates on 110 volt, 60 cycle a.c.

The World-Wide clock is rather modernistic in appearance, with its chromium plated bezel and black satin-finished base. Can easily be mounted flush in a panel by drilling a 3 11/16" hole. The ½" flange will cover any drilling irregularities. ALL-WAVE RADIO.

◆

NEW C-D UNIVERSAL REPLACEMENT ELECTROLYTICS

ANOTHER CORNELL-DUBILIER innovation is the new type UM series of universal replacement electrolytics for a.c.-d.c. sets. C-D engineers, in designing this series, were cognizant of the great expense to servicemen in stocking exact duplicates, and the time consumed in obtaining them. It is now said to be possible by stocking only three replacement condensers, to quickly and economically service any a.c.-d.c. receiver.



Color coded leads, with color key clearly printed on the C-D label, assures accurate hook-up.

A complete listing of these universal electrolytics can be found in catalog 151-A, obtained by writing to the Cornell-Dubilier Electric Corporation, South Plainfield, New Jersey. ALL-WAVE RADIO.

(Continued on page 548)

New Sectional Managers

Members residing in Iceland, Kentucky and South Carolina should in the future send their signal survey reports to the new Sectional Managers appointed to serve in their territory. Their names and addresses follow:

ICELAND
Arni Sigurdsson, TF1,
P.O. Box 743, Reykjavik
KENTUCKY
Finlay Howard, W9LI,
Box 724, Harlan
SOUTH CAROLINA
James D. Seagle, W8NI,
2415 Buncombe Rd., Greenville

A number of other proposals regarding League activities will be presented to members next month. One is of considerable importance, and if approved should be of benefit to all listeners.

M. L. MUHLEMAN,
Acting Director

ORTHOTECH UNIVERSAL

(Continued from page 513)

connect grid caps to the top condenser stator lugs. If metal tubes are used, connect caps to the lower stator lugs. (See Fig. 3.)

3. The antenna lead from the r.f. section of the coil assembly may require shielding. If so, use a *low capacity shield material.* If not, bring the lead back across the width of the chassis as far away from coil components as possible. Holes near the edges of the interstage shield pieces might be used as lead supports.

4. So far as the 'front end' coil assembly is concerned, ten leads are provided, calling for simply ten connections. These are indicated in Fig. 2. Analysis of the circuit and a study of the assembly itself will prevent improper connections of leads duplicated in color.

5. Shield leads from T1 to the selectivity switch only if this seems necessary. Keep them as short and direct as possible, however, and well away from other wires—particularly those carrying r.f. or unfiltered a.c.

6. Stick to specified components, values, and general wiring details. The basic

TABLE I

With 260-mmfd. Condenser

Band	*Range, Mc.*	*Align at*	*Pad at*
1	.55- 1.56	1400 kc.	600 kc.
2	1.56- 4.4	3960 kc.	1750 kc.
3	4.3 -12.0	10.0 mc.	4.75 mc.
4	11.3 -32.	28.0 mc.	Fixed
5	32.0 -60.	Fixed	Fixed

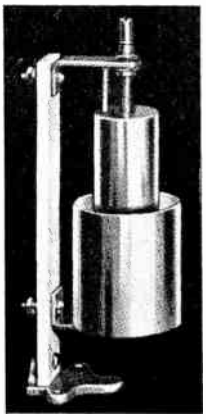
With 410-mfd. Condenser

Band	*Range, Mc.*	*Align at*	*Pad at*
1	.14- .410	375 kc.	150 kc.
2	.54- 1.80	1600 kc.	600 kc.
3	1.7 - 6.20	6000 kc.	1800 kc.
4	5.9 -18.0	17.0 mc.	Fixed
5	15. -42.5	Fixed	Fixed

(Continued on page 549)

JOHNSON CONCENTRIC NEUTRALIZER

E. F. JOHNSON CO., Waseca, Minn., has introduced a new line of concentric neutralizing condensers designed for the neutralization of the modern types of low-C transmitting tubes.



As shown in the accompanying illustration, these Type N condensers are cylindrical in form, and so designed that a relatively wide range of minimum-to-maximum capacity can be obtained without any change in voltage rating from the lowest to highest setting.

The insulating support is Alsimag 196. Extremely fine adjustments are possible, and the condensers occupy small mounting space.

Three types are available—Type N125 with a capacity range from 2.5 to 12 mmfd.; type N250 with a range of 3 to 12 mmfd.; and type N375 with a range of 3.5 to 12 mmfd. The numerals in the type numbers refer to the spacing between cylinders—the N125, for instance, being .125. ALL-WAVE RADIO.

◆

FIXED MICA PADDING CONDENSERS

ADJUSTABLE MICA PADDING condenser, replacing the usual fixed condensers with trimmer in parallel, are announced by Aerovox Corporation, 70 Washington St., Brooklyn, N. Y. These units are intended for use in intermediate-frequency and radio-frequency circuits.

Each unit is held together by a central screw by means of which the capacity may be adjusted. Due to the stability of the precise design, together with the micrometric adjustment, users can specify tolerances as close as plus or minus 1%, it is said, with the full assurance that units will come within such narrow limits, and remain so. Amateurs can readily vary the ca-

pacity over a wide range by adjusting the trimmer screw, thereby resonating circuits without addition of a trimmer condenser.

Dual units with one terminal as common, can be supplied in plus or minus 10% tolerances, up to .01 mfd. for the combination. Units are fabricated of finest grade mica and impregnated to repel moisture. Also thoroughly aged. Loss factor is reduced to negligible value, making the condenser highly efficient at all frequencies. Stray capacity is almost entirely eliminated, when using this single unit instead of the two condensers previously required, since capacity is now concentrated in a single unit. ALL-WAVE RADIO.

◆

WHOLESALE RADIO NOW IN BOSTON

WHOLESALE RADIO SERVICE Company, Inc., of 100 Sixth Avenue, New York City, added another link to their growing chain of modern establishments with the opening of their beautifully fitted display and salesroom at 110 Federal Street, Boston, Mass., with Mr. Michael Scott, well known radio merchandiser in charge.

The new store will serve as headquarters for radio servicemen, P.A. engineers, amateurs, experimenters, and short-wave fans living in the Boston area. ALL-WAVE RADIO.

◆

NEW IRC CONTROL GUIDE

ONE OF THE MOST comprehensive Volume Control Replacement Guides issued has just been announced by the International Resistance Company, 401 N. Broad St., Philadelphia, Pa.

The new IRC Guide in handy pocket size contains more than 200 pages and lists the proper IRC controls for replacement use on practically every standard receiver made up to the present time. In addition, it includes a wealth of volume control information, resistance calculation data, etc. which will prove invaluable to active servicemen. Copies may be obtained free upon request to IRC jobbers or direct to the manufacturer.

An outstanding feature of the new special replacement type "J" IRC Metallized Controls is the elimination of sliding, metal-to-metal contact thus doing away with the most common source of noise in any control. This exclusive IRC engineering development is known as the Silent Spiral Connector. It provides positive and continuous electrical connection between the center terminal and the volume adjustment arm. Slide, friction and noise are said to be eliminated 100% at what has long been a common point of control trouble. This new engineering development, together with the exclusive "Knee Action" 5-Finger Element Contact, is double assurance of Controls that are exceptionally quiet—and permanently so. ALL-WAVE RADIO.

◆

NEW JEFFERSON BULLETIN

BULLETIN PA-14 describing Jefferson Automatic Bias for Class B Modulators has just been published by Jefferson Electric Company, Bellwood, Ill. The bulletin contains, besides a general engineering discussion of the principles involved, complete diagrams of circuits and necessary instructions. ALL-WAVE RADIO.

STANCOR "HAMANUAL"

A NEW "HAMANUAL" is announced for distribution October 1st by Standard Transformer Corporation—a combination amateur catalog and construction manual.

It contains 16 new transmitter circuits very effectively done in blueprint style. The circuits range from 5 watts to 1 kw. and have all been exhaustively tested in Stancor Laboratories.

The revised line of transformers which the "Hamanual" announces will be good news to both amateur and jobber since the range of the line has been materially increased, although the catalog actually contains fewer units than the previous Amateur Manual. ALL-WAVE RADIO.

◆

C-D ETCHED FOIL CONDENSERS

THE ACCOMPANYING PHOTOGRAPH illustrates the comparative sizes between etched foil dry electrolytic capacitors and equivalent plain foil types. Cornell-Dubilier's line of electrolytics include the type KR metal container and JR silver cardboard container etched foil series in a complete capacity range from 4 to 16 microfarads, including the popular multiples, rated at 200 to 525 volts.

Despite the new type condensers' extreme compactness, these small units are triply sealed, insuring protection from humidity and abnormal temperatures. Furthermore, the excellent electrical characteristics of these compact condensers are on par with equivalent plain foil types, it is said. Power factor and leakage losses are negligible. ALL-WAVE RADIO.

(Continued from page 547)
circuit has been developed after months of experiment.

7. With the set built up the following voltages will be present: across the speaker field, 90 to 100 volts; at the power tube screens and plates, 300 volts (adjust to this value for push-pull 6F6 Class A Pentodes by moving the tap on the bleeder resistor R25) or more as required; r.f. and i.f. screens, 100 volts; r.f. and i.f. plates, 250 volts; 6L7 screen, 150; 6L7 cathode, minus 6; r.f.—i.f. cathodes, minus 50 down to minus 3 minimum limit; 6J7 plate, 200; 6J7 screen, 160.

8. Adjust the i.f., with the selectivity switch set for "sharp" reception, to exactly 456 k.c. using a test oscillator.. Refer now to Fig. 2 and align and pad high-frequency circuits as outlined in Table I. Very little adjustment will be necessary, as each coil assembly is aligned at the factory.

(To be continued)

ELIMINATING QRM

(Continued from page 519)

one of Fig. 5-B which makes the field serve as a choke. The center-tapped condensers are to be connected across the brushes—not across the line. If the frame of the motor is grounded the center-tap of the two condensers can return directly to the frame of the motor. When this is impossible the circuit of Fig. 5-C is suggested. Dangers of shock are reduced by the additional series condenser of .01 mfd.

Motors of the shunt type must have the condensers directly across the line which is also directly across the brushes. In all cases the wires should be short so as to prevent them from being effective radiators. Whenever condensers are not sufficient, chokes may have to be added, making a circuit like the one in Fig. 3 but the chokes must be of heavy enough wire to carry the current.

Noises caused by switches can be eliminated by the resistance-capacity filter shown in Fig. 6. This is to be connected across the switch, not across the line. The proper size of the resistor and condenser depends on the current drawn by the circuit. In most cases .1 mfd. and 500 to 1000 ohms will be found satisfactory.

Thermostat controls and flasher signs are nothing but switches and can be treated the same way. One circuit which has been found effective for flasher signs is shown in Fig. 7.

Electric doorbells and buzzers can be treated with the customary filter as the one in Fig. 3.

Considerable difficulty is encountered by neon signs. If the neon sign is excited by high-voltage a.c. condensers can be fitted across the primary as in Fig. 8; it is also effective to include a choke—properly insulated—in between the letters of the sign. If r.f. is used the remedy is a narrow metal band around the glass tube near the middle of the sign, this band to be grounded. The proper place is found by sliding the band over the tube.

Diathermy machines, X-ray machines, violet rays, etc., are small radio transmitters and cause severe interference. The power line should be filtered at the source of the interference by a filter similar to the one in Fig. 3. The directly radiated interference can only be stopped by a complete shielding of the room and filtering of all wires passing through the shield. If a power line filter is used at the machine, however, the special aerial will probably take care of the direct radiation.

(Continued on page 551)

Backwash

A PLEA FOR RUGGEDNESS

Editor: Mr. Deeds certainly went to town in your August issue and to me the article was a masterpiece in story-telling.

However, it is no fable that the series of unfortunate events, principally tube failures, is a true picture of what can be expected of present-day commercial receivers.

The only means available to forestall such trouble is that of extraordinary and burdensome testing of the circuit and tubes before the set is sold.

It is my opinion that the manufacturers are paying too little attention to durability and ruggedness. In modern receivers you find complicated circuits and it is claimed performance of a high order makes necessary these latter day refinements. But of what avail is superior reception when attended by annoying breakdown at too frequent intervals?

Of course, every manufacturer strives to produce receivers which approach the ultimate in performance and service at a certain price level. The rub is that the price level generally is incompatible as a proposition where quality is a prime factor.

But assuming that cost is immaterial and a man purchases such an instrument he should enjoy listening to programs for at least a year without being bothered with service work.

That is not the case at present, at least to the extent that receivers costing up to three hundred dollars, with which I have had experience, require service two or three times a year.

Now as I have shown, and believe, the fact remains that despite the absence of price limitation, manufacturers have demonstrated they are incapable or incompetent to produce good, sound material.

No wonder custom-built apparatus production continues to grow in the radio field. People are tired of being tormented instead of entertained by their radio.

The problems introduced by the participation of large corporations exercising a controlling interest in program origination, communications and industry, may not be readily apparent but further specialization seems to be the solution to advancement of the status of servicemen and dealers as well as the distributors and manufacturers, and to a renewal of public confidence in the radio and electrical appliance fields.

WILLARD MOODY
NEW YORK, N. Y.

(There is a great deal in what you say, and no doubt we could all do with a bit more ruggedness in stock receivers. But experience has shown that the average good commercial set does not come up for servicing for at least a year. In relation to this, it is interesting to observe that the sale of servicing manuals for a given year is low at the outset and increases in proportion to the age of receivers, up to a limit of about three years. —Editor.)

◆

COMMERCIAL C.W. REPORTS

Editor: It has been eleven months since I bought my first ALL-WAVE RADIO and I have enjoyed each issue more than the one previous; I have read them over completely many times and I find something of interest every time.

The list of commercial c.w. stations you published in the June issue has been of great value to me for during July and August I learned to read code and have heard many of them. I have letters of verification from FQO, Sainte Assise and LCP, Jeloy.

Your lists of s.w. stations published monthly are of great use to me. I have checked them against my QSLs and have found them correct in all but one instance; in your September issue under W1XK you have the symbol that means the station does not verify. This is true in part as although the station itself does not verify, it sends all letters received to the sponsors who sometimes verify for the station. My letter of verification is from the Paine Weber Co. confirming reception.

I think that the article by Zeh Bouck and the Editorial Quotes on the Amelia Earhart-Fred Noonan tragedy are two of the best that have appeared in your magazine since I have read it.

Mr. La Rocque may be interested to know that in a letter received from WTAR's DX Correspondent, he informed me that as soon as tests are completed WTAR will operate from Glen Rock, Princess Anne County, Virginia, with 1 kw. full time with a directional antenna. He may also be interested to know that KDKA, long infamous for non-verifying policy, seems finally to have broken down for I have received a letter confirming a report of mine to them.

In closing, let me say that I think if Mr. Hinds would put the commercial c.w. stations recently reported in his article as he does the 20-meter fone amateurs, many of your readers would appreciate it very much. Although it would be of no use to the SWLs who couldn't read c.w., they could well afford to relinquish the little space it would take in view of the many other splendid articles you print for them. There would be the additional attraction for your magazine of being the only one that publicizes commercial c.w.

ALAN B. SHAW
JACKSON HTS., N. Y.

(We would be glad to give over an entire page to commercial c.w. stations if there is a sufficient demand for such data. Judging from recent letters, it appears that there may be. But we would prefer to have the opinions of more readers before making a final decision. If you agree with Mr. Shaw, drop us a postcard. —Editor.)

◆

ATTENTION C.W. LISTENERS

Editor: I picked up my first copy of ALL-WAVE RADIO yesterday (not the last by all means) and sure got a kick out of it.

I concentrate all of my DX efforts on commercial c.w. My first two days in this line netted me some fine results. Here are a few of the easy catches which I hear quite consistently: KQY, WTJ, VRR5, IBD, HBO, PPH, PDQ, HBH, JUX, IBT, DGG, FYR, DFJ, HPE, FSE, SPW, HJO, GFJ, FXE, GLY, SLD, PFG-PCS, IBC, OXV-OXR, DGO, TAG, GFN, DKQ, OXR, FYR, PLQ, OER, LSI, XDY, LCKG, GMF, PLK, SBN, LSK, TIS, XDA-XDW, IRX, KOM, IPT, OXE, PNJ, ZEN, NPO, JNJ, TPC, VIS and KKL.

I am only 15 years old but I built my own receiver; a 2-tuber—one 58 and one 27 or 56, I'd sure be glad if you could hitch me up with someone interested in commercial c.w.

Kicking off the switch after vy 73, I remain

J. PARKER SHIPLEY JR.,
OMAHA, NEB.

(Here's an invitation, if you're interested in commercial c.w. And by the way, why not report on your catches. There's presumably a great amount of interest in this phase of reception, and other c.w. hounds would appreciate your reports as much as would Mr. Shipley. —Editor.)

◆

POLICE RADIO LIST

Editor: For over a year, I have been a pretty steady reader of ALL-WAVE RADIO, getting my copies from the newsstands as they appear. I am what I call an AWL (all-wave listener), as I roam over the entire range of my set, a GE model A-86, particularly favoring the 20-meter 'phone band. My second choice is short-wave broadcasting, and to check my receptions, I always use the list appearing in your publication, and which is arranged by my good friend, Mr. Hinds.

Of the 2,255 stations I have logged so far, 102 are police calls in the 1700 and 2400 bands, so you can understand that I was much pleased to find a listing of these stations in August AWR. However, when it came to marking off the stations already heard, my pleasure was greatly diminished by my finding several errors and omissions.

(Continued on page 553)

The Condensers

Condensers for interference suppression should be able to withstand the high-voltage surges which occur on the line. Those connected to the 110 volt line should preferably be rated at 600 volts, continuous working voltage. They should be of the paper type and non-inductively wound. Fuses are recommended as mentioned earlier.

Chokes

The chokes should have a maximum of impedance over the tuning range of the receiver. In general, the larger the choke, the better if it does not have too much distributed capacity. Economic considerations and space limitations usually fix the size of the choke. Standard sizes for chokes have been anywhere between 100 and 1000 microhenries. Smaller sizes are used for the short waves and an all-wave filter usually consists of several sections with different size chokes.

In designing a choke the current-carrying capacity of the wire should be taken into consideration. Since heavy wire means an expensive and large choke, the filter is often designed to carry no more than the current for a good sized receiver and care should be taken not to overload it. Table I shows the current-carrying capacity of several wire sizes as given by the National Board of Fire Underwriters, together with the maximum allowable number of watts on a 110-volt line. It is best to employ a liberally large size of wire since the choke is likely to be ill ventilated.

DX CITATIONS

(Continued from page 517)

supply with his application adequate proof of the reception of one station in each of the six recognized continents of the world. By "adequate proof" is meant verification cards or letters from the stations acknowledging as correct the original reception report submitted by the listener whose name appears on the citation application.

If the applicant's proofs of reception are found to be satisfactory by the Board of Judges, a DX Reception Citation certificate is issued. This certificate will carry the calls of the stations received and verified and the date on which the certificate is issued. The citation thus earned by the listener will carry with it the authorization to employ on his station report blanks, cards, and stationery the notation, "ALL-WAVE RADIO CITATION," followed by the letters "SWB" (Short-Wave Broadcast) and the Degree, as indicated on the certificate.

The initial certificate issued is a First Degree Citation, so that the listener would be authorized to employ the notation, "ALL-WAVE RADIO CITATION SWB FIRST DEGREE," which would indicate that he had obtained the verified reception of one station in each of the six recognized continents of the world.

A listener applying for a Second Degree Citation is called upon to supply proof of reception of six *additional* stations, one in each of the six recognized continents; another six *additional* stations for a Third Degree Citation, etc. Each station call recorded in the listener's personal life is automatically ruled out of subsequent applications.

ALL-WAVE RADIO has arranged to have all Citations mailed flat, and protected by cardboard, so that they will be received in proper condition for framing.

It is urgently requested that all potential applicants for citations read carefully the following information regarding requirements and rules governing the issuance of the certificates.

RULES AND REGULATIONS
General

(1) Any person, in any part of the world, may apply for a citation covering any one or all of the bands for which certificates are issued (Standard Broadcast Band, Short-Wave Broadcast Bands, Amateur Phone Bands.)

(2) Address your applications to: Citation Division, Radio Signal Survey League, 16 East 43rd St., New York, N. Y.

(3) Application may be a letter, or merely a sheet of paper, stating the band in which citation is requested, the calls of the stations covered by your verifications, and your complete name and address *in printed form.*

(4) Include with your application the cards and/or letters verifying the reception of the stations listed on your application, and 25 cents in coin or stamps (international money order or bank draft if applicant is foreign resident) to cover the cost of packaging and mailing the citation and return of verifications. Though the Board of Judges will take every reasonable care of the verifications you submit, it cannot guarantee their safe return.

(5) No time limits are involved—a listener may submit station verifications accumulated over a period of years even though the stations may no longer be in existence.

(6) Listeners may submit at one time a sufficient number of verifications that will credit him with any Degree he is able to attain; thus he may submit twelve verifications—two for each of the six continents—with his first application and receive immediately a Second-Degree Citation.

(7) Verifications from stations located on islands will be considered as representing the nearest continent, but cases in question will be decided by the Board of Judges and their decision considered final.

(8) Questions involving the authenticity of a station verification will be discussed by the Board of Judges, and final decision determined by vote. In the event of a dissenting opinion, the applicant will be requested to obtain definite verification from the station in question, or submit another verification covering the reception of some other station in the same continent.

(9) Should a station change its call letters, the new call cannot be submitted for citation if the previous station call is recorded in the listener's file as having been instrumental in his obtaining a previous Citation certificate. The same rule applies in the case where a station previously recorded is moved from one location to another.

(10) The Board of Judges reserves the right to revise, delete or add to the rules governing the issuance of Citation certificates when necessary, that the recognition they provide may remain equitable.

Standard Broadcast Band Citations

(1) These Citations are issued only upon the receipt of adequate proof of the reception of broadcast programs in the Standard Broadcast Band from one station in each of a minimum of four of the six recognized continents of the world: North America, South America, Europe, Asia, Africa, and Oceania.

(2) Accredited reception of one station in each of four continents entitles the applicant to a First Degree Citation; of one station in each of five continents a Second Degree Citation; and of one station in each of the six continents a Third Degree

Citation, providing all verifications are submitted at the same time.

(3) A second set of four verifications from one *additional* station in each of a minimum of four of the six continents entitles the applicant to (a) a Second Degree Citation if the previous citation covered four-continent reception, (b) a Third Degree Citation if the previous citation covered five-continent reception, (c) a Fourth Degree Citation if the previous citation covered all-continent reception, etc.

(4) A listener holding a First Degree Citation may apply for a Second Degree Citation by submitting proof of the reception of a station in one of the two remaining continents, or a Third Degree Citation by submitting proof of the reception of stations in both the remaining continents.

Short-Wave Broadcast Band Citations

(1) These Citations are issued only upon the receipt of adequate proof of the reception of broadcast programs in any of the Short-Wave Broadcast Bands from one station in each of the six recognized continents of the world: North America, South America, Europe, Asia, Africa, and Oceania.

(2) Verifications from experimental or commercial radiophone stations will be honored only in the event that they distinctly prove reception.

(3) Verifications of the reception of broadcast programs from ship or mobile stations, or verifications of radiophone transmissions from expedition stations will be honored on the following basis: (a) if the verification indicates the position or location of the station at the time the transmission was intercepted by the listener, it will be credited to the continent nearest the station's position or location; (b) if the verification does not indicate position or location of station at time of its interception, it will be credited to the continent in which the listener resides, or to another continent if substantial proof can be supplied by the applicant.

(4) Verifications from code stations will not be honored.

Amateur Phone Band Citations

(1) These Citations are issued only upon the receipt of adequate proof of the reception of radiophone transmissions in any of the Amateur Phone Bands from one station in each of the six recognized continents of the world: North America, South America, Europe, Asia, Africa, and Oceania.

(2) The verification or QSL cards submitted must offer substantial proof of reception by the applicant.

(3) All QSL cards submitted must be verifications of the reception of a direct transmission; stations heard on re-transmissions do not constitute direct reception.

(4) Verifications from code stations will not be honored.

BACKWASH

(Continued from page 550)

Firstly, I am going to list those stations which I have heard and logged, but which are not recorded by you:

WKDC	Cincinnati, O.	1706
WMP	Framingham, Mass.	1666
WPED	Arlington, Mass.	1712
WPEH	Somerville, Mass.	1712
WPEI	E. Providence, R. I.	1712
WPEL	W. Bridgewater, Me.	1666
WPDJ	Passaic, N. J.	2414
WHWN	.....Maryland	1698

The WQFs are not arranged alphabetically as to the fourth and final letter; WNEP should be WNFP; the frequency of WQFZ is 2458, not 2452; and, of course, as I can only check about 100 items, or less, there are probably additional errors that I have not been able to notice.

I don't want you to think that I am trying to be fussy or technical—I understand the difficulties of assembling a list of this sort, especially the first edition thereof, and my purpose in writing is because I believe you will wish to correct the mistakes, some of which are probably only printer's errors, in the next revision of this list.

There are two suggestions I would like to advance for any new or revised list—firstly, list the stations separately for each frequency band, because I have found that this is the only quick way to identify. The signals are given very quickly, sometimes only the call letters, and other stations only mention the city, so it is essential to have all the stations on a given frequency brought together for quick reference. Secondly, couldn't you cover all North America by adding the few Canadian, Cuban, and Mexican police calls?

F. WALTER POLLOCK
WEEHAWKEN, N. J.

(Many thanks for the dope. Yes—preliminary lists are usually a bit haywire, even though we use government data as a working basis. Your suggestion is sound and we will attempt to arrange the next police list in this manner. Editor.)

NATIONAL NC80X

(Continued from page 529)

which would be the case were a diode rectifier employed. The 6C5 serving this purpose functions as a linear triode detector and, aside from contributing voltage again it presents a high impedance to the secondary of the i.f. transformer to which it is coupled. The selectivity of this transformer and its voltage gain are therefore not impaired. Again, the voltage amplification obtained in the second detector tube, plus the power sensitivity of the 25L6G output tube, precludes the necessity of employing an intermediate a.f. voltage amplifier.

The 6B8 tube is also an important factor in the proper operation of the receiver. It may be said that amplified automatic gain control is used for two reasons; first, to isolate the diode load from the secondary of the second detector input i.f. transformer, and second, to provide adequate control of receiver gain over very wide excursions of signal voltage. By amplifying the signal voltage

to be employed as automatic control bias. the ratio of the change in signal and bias voltages can be made greater, resulting in far less change in output over far wider excursions in signal voltage. At the same time, the sensitivity of the a.v.c. system to weak signals is greatly increased, and to guard against this, the a.v.c. action is delayed so that the full gain of the receiver is available for weak-signal reception.

The a.v.c. system controls the three i.f. stages only, and this is likewise true of the manual r.f. gain control. The first detector operates at maximum gain at all times. Were this not the case, the weak-signal sensitivity of the receiver would be poor.

The high-frequency oscillator is electron coupled. Voltage is fed directly to the cathode of the 6J7 first detector from a tap on the oscillator coil. The beat-frequency oscillator is also electron coupled.

Voltage Regulation

Certain desirable features have also been gained by designing the receiver for a.c. or d.c. operation. For one thing, the set runs much cooler than it would if a power transformer were present. For another, voltage regulation is much better, which results in improved oscillator stability and reduces the detuning effect occasioned by the adjustment of the r.f. gain control by ten to one.

And these points are gained without sacrificing output power, as the new 25L6G tube used in this receiver is capable of supplying 2 watts undistorted power to the 8-inch permanent-magnet speaker supplied with the receiver. Then there is always the advantage of being in a position to use the receiver on most any power line.

WIDE-RANGE TUNER

(Continued from page 521)

100,000 ohms for R6 will permit the detector to handle the desirable maximum of 100 per cent. A value of 50,000 ohms, may in some instances prove even more desirable, but the lower the value of R6 the less the gain in the detector stage.

The only apparent disadvantage of the infinite-impedance detector rests in the fact that since the load is in the cathode circuit, any leakage between heater and cathode will result in the development of a hum voltage across the resistor R6. The hum will of course be passed on to the audio amplifier.

The cure is obvious—the use of a 6C5 with no leakage. But for those who know how to go about it, it might be added that if difficulty is had in obtaining a tube free of leakage, the hum can be partially or completely eliminated by placing a *positive* bias on the heater

of the 6C5 of not less than 12 volts. If the heater winding on the power transformer is floating, this voltage can be obtained from the ungrounded end of the 6L6G cathode resistor R17. (See diagram of amplifier on page 455, September AWR.)

As the diagram of the tuner shows, all operating power is derived from the amplifier unit through a four-wire cable and plug. The tuner can therefore be placed some distance away from the amplifier unit if so desired.

Adjustment

There is no necessity to provide further data on the construction of the tuner beyond that given in the various figures. A separate chassis ground point should be used for each individual stage, with all bypass and tuning condensers and coil returns made to these points.

The only adjustments required after the completion of the tuner are the trimmers which are located on the top of each gang condenser section. A station should be tuned in with the volume turned well down, and these trimmers adjusted for maximum volume. The tuner is then ready for use.

The System In Use

The wide-range system was made into separate units so that they could be positioned as the constructor saw fit. Almost every living room has shelves and cabinets into which the units may be placed. In such a case the tuner and amplifier controls do not necessarily have to project directly through a panel. Flexible shafts of the type used in conjunction with auto-radio receivers may be used to bring all controls to a convenient position.

If the tuner and amplifier are permanently mounted in the same cabinet, or set in close relation to each other, it may be found preferable to replace the interconnecting jacks with standard terminal strips. The phonograph jack may also be replaced with a terminal strip if the pickup and turntable are permanently mounted, as a switch is provided on the amplifier for changing from radio to phonograph without the necessity of disconnecting any units. Since a dual a.c. outlet is provided on the amplifier chassis, a phonograph motor can be connected permanently to this source.

Since little heat is radiated from the tubes in the tuner, this may be mounted in the loudspeaker cabinet if desired. A convenient method is to mount the tuner in the upper left corner, with the gang condenser and volume control shafts protruding through the left hand side of the cabinet. A series of 6.3-volt pilot lights can then be mounted along the edge of the top panel of the cabinet, and these connected to a rotary contact switch arrangement on the tuning con-

denser shaft so that the lights will function as station indicators. When arranged in this manner, the listener need only stand in front of the speaker cabinet and turn the tuning knob with the left hand until the pilot light for the desired station is illuminated.

This "spot tuning" system can be made quite easily by inserting contact studs in a thin disc of wood or bakelite and mounting the disc on the condenser shaft. A spring strip from an old phone jack, or any type of metal contact mounted on the condenser frame by means of an insulating block, will suffice as the common circuit contact. This should be so mounted that it will make contact with the studs on the insulating disc. Each of the studs used should be connected to a pilot light by means of a flexible lead. Each stud should be so mounted on the disc that it will make contact with the jack spring only at the point where the station it designates is properly tuned in.

There are numerous other ways of working out the same system, and one is probably as good as another. The only point to keep in mind is that the contacts must be sharp so that each pilot light will be illuminated only at the exact point of resonance.

If remote control is desired for the tuner, the adapter unit for "armchair tuning," described by Clifford Denton

LIST OF PARTS FOR TUNER

ALADDIN

2—type 3001 interstage r.f. transformers (L)
1—type 1501 antenna r.f. transformer (L1, L2)

CORNELL-DUBILIER

6—type DT-4P1 .1 mfd., 400-volt tubular (C1, C2, C3, C4, C5, C6)
1—.00025 mfd. midget mica (C7)

IRC

2—350-ohm, 1/2 watt carbon (R, R3)
3—100,000-ohm, 1/2 watt carbon (R1, R4, R6)
2—2000-ohm, 1/2 watt carbon (R2, R5)
1—50,000-ohm, 1 watt carbon (R8)

PAR-METAL

1—type C-4510 chassis 7" x 7" x 2"
1—type CP-4510 chassis bottom plate

RAYTHEON

2—type 6K7 tubes
1—type 6C5 tube

WHOLESALE RADIO

1—type K9712 (or K9722 clockwise rotation) Trutest .000365 mfd. 3-gang tuning condenser (C)

YAXLEY-MALLORY

1—type A-1 open-circuit jack
1—type K 50,000-ohm potentiometer (R7)

Miscellaneous

3—octal wafer sockets
1—4-prong wafer socket (for power connections)

in the September issue of AWR will do very nicely. If this adapter is used, both the tuner and amplifier can be placed on the floor behind the speaker cabinet, or hidden away.

Amplifier Requires Ventilation

The possibilities of mounting the entire wide-range musical system in an unobtrusive but convenient manner are numberless. We leave this entirely up to the constructor. Just don't forget to provide ample ventilation for the amplifier unit.

QUERIES

(Continued from page 544)

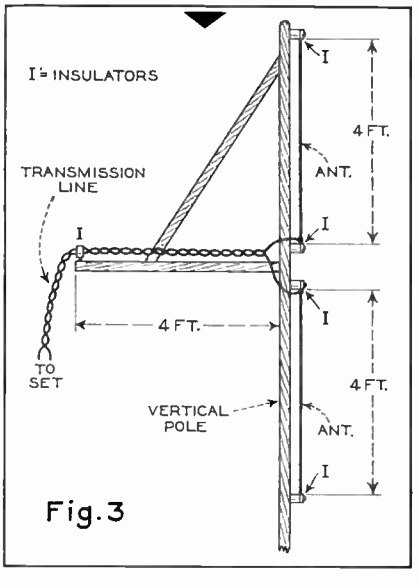
orchestras. The broadcasting company supplies the announcer, the control man and all necessary equipment. The programs are put on a sustaining basis from the broadcasting company's point of view. Cheap talent for the broadcaster and cheap advertising for the hotels and night clubs—and a lot cheaper for those who listen at the side of the loudspeaker rather than at the side of the dance floor.

Question No. 43: I have recently purchased a five-band receiver tuning from 5 meters to 2000 meters. I have never been able to get anything on 5 and 10 meters. I am using an ordinary all-wave antenna system, and am wondering if that is at fault on the ultra-high frequencies.—*J. H. F., Schenectady, N. Y.*

Answer: As a general rule all-wave receivers do not give as good results on 5 meters as receivers especially designed for ultra-high frequencies. The same limitation applies somewhat to the 10-meter band, though some of the more expensive all-wave receivers will give good results there—especially the communications type.

With general-purpose receivers, 5-meter reception will usually be limited to short distances. The 5-meter band will probably be permanently dead more than twenty-five miles from a large city. However, there is a veritable nest of 5-meter transmitters within range of J. H. F.—in Schenectady, Albany and Troy—and he should secure good results with his receiver—though quality may be poor on many stations due to the sharpness with which his receiver probably tunes. (Relatively broad tuning receivers are desirable on the 5-meter band.)

A special antenna is desirable, the lack of which is probably responsible for the negative results our correspondent is securing. Such an aerial is shown in Fig. 3, which is fundamentally the same as Fig. 2. It is, however, a vertical antenna, rather than horizontal, the twisted feeders are not "fanned" where they connect to the doublet and the length of the antenna is only 8 feet. This aerial should be erected as high as possible and preferably out-of-doors. The lead-in should not immediately parallel the antenna, and a simple mechanical construction is suggested.



Dimensions and the constructional suggestions for a 5-meter vertical antenna.

The ordinary all-wave antenna will occasionally give fair results on 10 meters—as will any multiple of eight feet merely connected to the antenna post of the receiver (counting the length of a simple, open lead-in). However, best results will be secured with a horizontal doublet such as shown in Fig. 2. The total length of the aerial should be 16 feet, and the lead-in or transmission line need not be fanned.

It is well to remember that the 10-meter band is practically dead during the summer time, and that at other times of the year it may behave erratically. So do not be disappointed if your first few attempts bring in nothing more than background noise.

CHANNEL ECHOES

(Continued from page 533)

home from Europe with her. She has denied that it is her husband's child. If the child is illegitimate, it is probably Paul's—which would be quite satisfactory to the radio audience, but not at all to Tenderleaf Tea. The alternatives are an adoption or an immaculate conception, either one of which will leave the program decidedly flat.

◆

HIGH-LIGHT OF THE Louis-Farr tussle: The World's Champion he-man is introduced following the decision and he answers his interviewers with "Yes'm . . . yes'm."

We understand that McCarthy was given the job of announcing the fight because it was figured that it wouldn't go father than one round and there wasn't much chance of his getting mixed up. As it was, listening to his description, we gave five rounds to Farr, three to Louis, and the rest either even or leaning somewhat on the Farr side. It would appear that about the only thing you can depend upon McCarthy for is a Buick plug. Back in the early days of fight broadcasts, there was one announcer whose ring-side description could be

transcribed the next day and checked practically blow for blow with the newspaper commentary. We forget whether this was McNamee or Major J. Andrew White.

Of course, it is quite possible that McCarthy's description was absolutely accurate and that Farr won the fight. A good many observers think he did, and an adverse decision would by no means be contrary to the ethics of those who rule boxing in the U. S. A. It really doesn't make much difference. As far as we and a few million more fight fans are concerned, the Champ today is Max Schmelling.

✦

SPEAKING OF MCNAMEE, readers still persist in identifying the photo in our June column with the Indianapolis speedway. Everyone recognized McNamee, of course, and the type of microphone placed the date as well over a decade back. However, no one came close enough to win the free subscription, so we'll put an end to the misery and simply state that the picture was taken in the Yankee Stadium, where McNamee announced the World Series in 1926.

✦

LOST STRAYED OR STOLEN: Will the gentleman appearing in the photograph on page 533 kindly come forward and identify himself? This was sent to this department some months back with no means of identification. If there's a story behind the picture we'd like to have it!

NIGHT-OWL HOOTS

(Continued from page 532)

this station could easily "cash in" on American advertising as its 5 kw. easily covers great parts of this country—but it is strictly a Mexican station for Mexican people, furnishing the best entertainment in provincial Mexico. P. S.—They also verify all reports containing return postage! Three more cheers.

Jeers this month go to the Canadian Radio Commission who have recently adopted a new verification policy for their Toronto stations. They go to great effort in typing and mailing long personal letters explaining why they cannot any longer verify reception when it would be more pleasant for everyone, and certainly not any more expense or trouble to type "reception verified" on a penny post card and mail it to the expectant DXer. Let us hope that C.R.C. will reconsider their recent action before many of their supporters begin to jeer also.

HAMFEST

(Continued from page 527)

. . . when QSB meant your note or tone is bad instead of QRI . . . when QSC meant your spacing is bad instead of QSD, and QSD meant what is your time . . . when QSQ meant who is calling me instead of QRZ . . . when QST was a general call to all stations . . . etc., etc., ???

Of course with the passing of the spark some changes were in order—but why so complete a revision of an internationally accepted and arbitrary code? You've got me.

✦

D. REGINALD TIBBETTS, W6ITH, Berkeley, California, sends us the following dope:

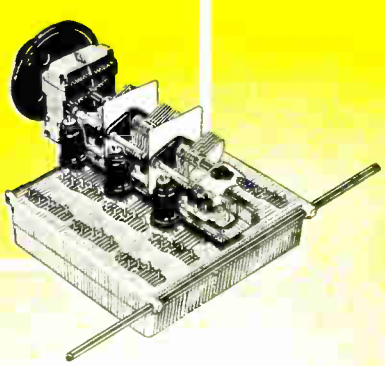
"Amateur Radio Station HO2U is on a ship on a round-the-world cruise. He is west-bound from San Francisco at present, and will be around the world in a year. His frequency is 14,140 and is on fone—sometimes c.w. He is on daily at 6:00 a.m. and midnight Pacific Standard Time.

"The transmitter has 100 watts output and puts in a swell signal here. I worked him the morning of August 25th at 6:30 PST. He says he will QSL all stations and listeners. He will give his exact location at the time of QSO or reception on the face of the card."

INDEX TO ADVERTISERS

No need to flatter the NC-100 in rosy terms on *this* page! All-Wave Radio readers know its advanced design and brilliant performance. They have proved its uncanny ability to pull weak signals into the clear even under the most adverse conditions. And they have appraised its dollar value and found it a wise investment.

NATIONAL NC-100X



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