RADIO LORE FOR NOVICE AND EXPERIENCED FAN

Huge Army Radio Net Spreads Over Country Saving Big Tax

Completion of System Eliminates Heavy Payments to Private Concerns for Delivery of Official Messages.—Signal Corps in Charge

BY JOHN A. BALLARD.

The recent radio conference in Washington directed our attention to many amazing revelations regarding the expansion of commercial and Government radio activities as well as in the familiar broadcasting field. In his address at the conclusion of the conference Secretary Hoover mentioned the interference difficulties presented by the 18,000 licensed transmitting stations in the United States. In discussing the ever-increasing demand for assignment of wave-length bands Mr. Hoover mentioned the needs of the army and navy in this connection.

We are all familiar with the Navy's obvious requirements for radio communication between vessels and for its ship-to-shore message traffic, but the needs of the army for radio communication in peace-time are not as apparent. This is a phase of the work of the United States Signal Corps that is rarely brought to the attention of the public.

The impression, held by some, that the army carries on in peace-time in a manner that might be likened to the fatted calf, is an erroneous one. All branches of the military establishment are actively engaged in constructive public service of some sort, and not the least energetic of these peace-time activities is the work of the communications division of the Signal Corps. This branch of the signal service operates the War Department radio net, a comprehensive network of radio stations covering important cities within the continental limits of the United States.

While the radio net was established primarily to eliminate duplication of effort and to save taxpayers money by the elimination of sending many messages by commercial telegraph, the net is now one of the biggest links in the nation's chain of national defence.

A glance at the accompanying map gives a good idea of just what this net is and what it means in the way of co-ordinating activities in time of stress or catastrophe. The various lines, as explained in the legend on the map, are in reality "paths in the air" in most cases, as communication is carried on virtually entirely by code and radiophone transmission.

One of the most impressive features of the development of this service is the fact that it has been done so quietly and yet so efficiently that the general public probably knows but little of its work or of its vital part in protecting and expediting the military and peace-time activities of the nation, both internally and in coastwise and transocean communications.

Not only does it provide efficient means of covering virtually every corner of the country in a very short space of time, but it is training officers and enlisted men in a service which has become very important in modern military practice—the telephonic and radio communication systems.

Those who train in this course not only receive a thorough discipline in the routine of communications, but they are instructed in the very latest which the science of radio has to offer, for it is the boast of this service that it keeps at all times abreast of the best in radio.

The War Department radio net came into being in January, 1922. The inauguration of this important service was due to military necessity, its growth was the result of the policy of the President of the United States to save the taxpayer's money by the establishment of the budget system.

In preparing the budget, when the expenditures of all Government departments were carefully scrutinized, it became apparent to the chief co-ordinator that there was a duplication of effect in Government communication activities, entailing unnecessary expense.

In a preliminary study of the situation it developed that the following departments—Army, Navy, Agriculture, Post Office, Treasury and Shipping Board—All operated independent communication agencies, the efforts of which might well co-ordinate in handling official telegraphic business of all departments and bureaus of the Government, at a considerable saving.

A joint conference was called of all governmental departments and bureaus concerned, to adopt a plan to effect the co-ordination decided upon. It was found at this conference, that the Army Signal Corps was paramount in inland communication and the navy in offshore communication.

The general policy was then adopted that the Signal Corps would utilize its facilities for all inland communication and the navy would handle all overseas message traffic. The chief signal officer, the ranking officer of the Signal Corps, gave his personal supervision to the application of this policy, with the result that an efficient communication system, the War Department radio net, was developed.

For the first time in our history, governmental business within the continental limits of the United States was conducted by radio. The extent of this new service and the amount of message traffic involved can be realized by considering the accompanying map of station locations and the fact that governmental telegraphic business is now handled by the War Departemnt radio net for the following departments and bureaus:"

War Department, Navy Department, Department of Labor, Department of Justice, Shipping Board, Post Office, Civil Service Commission, Internal Revenue, Interstate Commerce Commission, Veterans' Bureau, Public Roads, Panama Canal Zone.

With the growth of this net it was necessary for a separate section of the communication division of the Signal Corps to be organized to carry on this important work. As a result, the radio, plant and traffic section was formed.

This section is charged with the installation, operation and maintenance of all army radio stations on land and on vessels operated by the Army Quartermaster Corps. In this way the control of the radio system is centralized, since the section also assigns wave lengths and call letters, prescribes operation methods and schedules and settles interference cases.

In the beginning, with five stations in operation, about 50 official messages were handled daily, but this number increased rapidly and to-day the daily traffic at Washington, D. C., alone is about 600 messages. (The average Government official message contains about 40 words.) There are now 179 stations in the net, of which 53 are ship stations on Quartermaster Corps vessels. This total of 179 stations also includes 23 Alaskan stations, 4 in the Panama Canal Zone, 12 in the Philippines and 1 in Hawaii.

In the limits of the United States the stations are distributed throughout the nine Army Corps Areas, extending from the Atlantic to the Pacific, and, in addition to the army station, use is made of one navy station located at Bremerton navy yard, across the river from Seattle, Wash.

As a general rule, the traffic is handled directly to and from Washington, D. C., through the corps area stations. When necessary, however, where stations do not maintain continuous service the traffic is relayed to destinations via the local corps area nets, the latter also being shown on the accompanying map.

Most of the stations are equipped with a Signal Corps radio set, type SCR-140, a CW telegraph set using six-tpye P pilotrons, with a working range of from 200 to 600 miles. The transmitter operates on wave length of between 1000 and 3000 metres. The receiver is designed to receive in the 200 to 8000 meter wave-length range.

Data regarding some of the stations follows:

Call letter.	Name of station.	Weave length (metres)
WVA,	Washington, D. C.	1333 2998
WVP,	Governor's Island, N. Y	1000 1344
WUBA,	Fort Monmouth, N. J.	1000 1400
	(Camp Vail)	
WVQ,	Baltimore, Md.	1561
	(Fort Howard)	

Other principal stations are located at Boston; Fort McPherson, Ga.; Columbus, O.; Chicago; Omaha, Neb.; San Antonio, Tex., and San Francisco. Information as to call letters of these stations of the War Department net may be found in "Commercial and Government Radio Stations of the United States," published by the Department of Commerce.

All of the army radio stations in the net are operated exclusively by military operators, and it was soon found that this service was the best medium for the training of operators. However, the army cannot compete with commercial radio companies in the matter of salaries for operators, so as a result there is a large annual turnover in personnel, because as men complete their enlistments they often leave the service to accept more remunerative positions in commercial concerns.

Despite these frequent changes, however, there is a high esprit de corps and considerable friendly rivalry between the staffs at the different stations. All strive to have their own station pile up a record in distance and in the amount of message traffic cleared.

With various records of individual stations coming to light from time to time the officer in charge of the net decided it would be a pretty good thing to compile some data about the net as a whole, so his office in Washington issued the following statement:

"From July, 1924, to February, 1925, 105,972 messages, containing 4,502,004 words, were handled by the War Department radio net."

When it is considered that the most traffic comes in the summer time (during the camp training period for all components of the army), when, as every one knows, the operating conditions are poorest on account of static, this number of messages transmitted is indeed remarkable. It is a record to which the Signal Corps may well point with pride.

The actual saving to the taxpayer by having the army handle all Government official telegraphic business by means of its radio net has not been computed, but it certainly is a considerable sum. To-day the War Department radio net is the most complete and comprehensive radio net in the world.

Never "Dope" a Battery.

Do not make the mistake of "doping" a battery to make it active. A storage battery is made of lead, and lead compounds, which absorb acid from the battery solution as it delivers current. To begin with, the battery is fully charged and has a solution which contains the proper amount of acid. Because the plates absorb this acid as it discharges, some sleight-of-hand artists have been making a nice living by pouring more acid into it. Of course, the additional acid makes the battery operative. But the acid and the addition of more "dope" has no effect. The battery then must be charged. This forces the acid out of the plates and then there is trouble.

Short Circuits

SPACE CHARGE EFFECT

At times Smith likes to switch off the set and marvel at the science that makes it possible. It happened that I dropped in to see him during one of these revelries.

"I'm back inside one of these magic tubes again," he explained. "Just doing a little speculating on the side."

"What's there to speculate about?" I asked. "Thought you knew all the details of tube action?"

Smith was not so sure about it.

"It just has occurred to me," he said, "that when these little electrons start shooting off the heated filament the tube ought to get so filled with 'em they would repel each other. Electrons, as I picture them, are negative charges. Well, now, if you got the tube filled with them, how are you going to expect more electrons to jump off the filament? Like charges oppose each other."

That was true enough, but Smith was overlooking the effect of the positive charge on the plate of the tube. The plate charge tends to attract electrons against their better judgment. Their inclination to return to the filament when they meet a horde of their own kind in the tube space is overcome by their natural attraction for the positive charge impressed upon the plate by the "B" battery. Still, Smith's speculating was serving to introduce a feature of tube action that was new to him.

"You have stumbled over what is known as the space charge," I told him. "It is a very important feature of tube action because it is one of the situations you must take into consideration when you operate the set. The amount of current you apply to the filament or to the plate has an important bearing upon the space charge of the tube itself, and vice versa.

"First of all, however, get an accurate picture of conditions within a vacuum tube. To start with, there are the three visible elements: the filament, the plate and the grid which is placed between them. Some of the invisible features of the tube will be plain enough once you understand what these three elements do.

"When the filament is heated by connecting it into the 'A' battery circuit, it starts to give off electrons. Most tube filaments are coated with a layer of atoms of thorium, which are rich in electrons desiring to jump off. The more the filament is heated, up to a certain point, the faster is the rate of electron emission. All this, however, is said with the provision that the electrons have some place to go.

"You can't just shoot them off into the tube space and expect them to keep shooting off, because if any electrons are in the space and if there is nothing to attract others through this space, there is going to be a clash with electrons going back to the filament again. This is where the plate functions. We give it a positive potential by connecting it to a high voltage 'B' battery. The electrons then have somewhere to go.

"When the electrons start jumping to the plate they form an invisible bridge. The strength of this bridge, speaking roughly, controls the plate current, which is the current that starts to flow through the 'B' battery or plate circuit as soon as the electrons furnish a connection between the plate and the filament. The grid, carrying the tuned radio frequencies from the broadcasting stations, then controls this flow of plate current. But there are additional controls of this plate current. They have nothing to do with the changeover from radio frequencies to audio frequencies, but they have everything to do with reception. Unless they are right, the set doesn't work.

"Two controls of the plate current are within easy reach of any radio fan, but the third control requires practice if best results are to be had. The filament rheostat is one control. The tube filament must be heated to a certain temperature before it will operate properly, and it must not be burned too brightly. The second control is the plate voltage. Usually the set is wired so that the detector plate voltage is at a fixed point, but this must be in accordance with the type of tube used. And when the batteries commence to give out it is necessary to rewire the detector plate connection so as to give the plate the right potential value. The third control is a balance between filament control, plate potential and the negative space charge.

"This space charge is the tendency of the tube to retard the rate of flow of electrons from the filament to thep late and thus to retard the flow of plate current from the plate to the filament back over the bride of electrons when the filament is giving off more electrons than the plate will take. Usually the plate is wired for a certain value. Suppose it can attract 1000 electrons per second. So long as the filament does not give off more than this number of electrons per second, the space charge will not be effective. When the filament gives off 1200 electrons, however, the space charge effect is such as to send 200 electrons back to the filament per second. You can see, therefore, that the plate current is at its maximum when the filament gives off as many electrons as the plate will take, which is just below the point where the space charge-effect comes into play."

Smith interrupted me by tuning for a station and then practicing what he had just learned. Smith ought to be called a radio dynamo.

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Simple Receiver Now Demanded For Daily Home Entertainment

Designers Concentrating on Sets Meeting Ordinary Requirements.—Expert Explains All-Wave Receiver With Plug-in Coils

BY WILMER S. TRINKLE

The receiver here described is a very good example of the attempt now being made by most of the radio designers to meet the requirements of the average family. The operation is quite easy as the three condenser dials all read about the same when a station is tuned in and the only other adjustment necessary is the potentiometer controlling the oscillations in the radio-frequency circuit. No rheostats are used, regulation of the filament current of all five tubes being taken care of by automatic controls.

This arrangement of controls makes it easy for all the members of the family to use the set without waiting for the "expert." Perhaps one of the members is of an experimental turn of mind and would like to tune in on the lower wave lengths, for example, amateur code traffic and the low-wave-length broadcast stations. This receiver is designed to meet the above conditions, having a wave-length range of from 30 to 555 meters, accomplished by using various sized radio-frequency transformers.

The parts used in building this receiver are as follows:

One set of interchangeable R. F. coils.
Three condensers .0005 mfd.
Three four-inch dials.
One potentiometer.
Five Amperites No. 1 A.
Two audio-transformers.
Eight standard sockets.
One condenser .00025 megohms.
One condenser .006 mfd.
One condenser .01 mfd.
One single-circuit filament control jack, No. 3.
One double-circuit jack, No. 2 A.
One filament switch.
Nine engraved binding posts, as follows: "Ant, Gnd, A+, A—, B—, B+45, B+90, C—, C+."
One panel, 7 by 21 inches.
One panel, 6½ by 20 inches.

The antenna coupler and radio-frequency coils of each set of three coils are identical in appearance and winding, and are interchangeable. The windings are of the Lorenz type and are made rather oval in shape. The shape of the windings conserves space and to a certain extent limits the field to a definite direction, so that interstage coupling is avoided.

These transformers are mounted on a base having four prongs, similar to the base of standard vacuum tubes. Just as the prongs make contact with the springs of the tube sockets, so are these coils inserted in sockets, being thus interchangeable, so that three-coil combinations covering any of three wave-bands may be used with no more trouble than would be necessary in taking out an old tube and inserting a new one.

The connections from the sockets of these transformers are as follows: (G) and (A) are the primary, the (G) being connected to the plate of the preceding tube and the (A) to the "B" battery and the secondary leads are brought out through prongs which connect to the (P) and (A) posts, the (P) going to the grid of the next tube, while the (A1) is the grid return. This arrangement makes it easy to do a very neat job of wiring, because nearly all of the connections can be made below the baseboard.

Some makes of tube sockets do not have the polarity of the filament terminals indicated. With the filament terminals turned toward you, the left will be negative and the right positive.

The specified coils may be bought in three sets of three each. The No. 1 set is designated to cover a wave-length band of them in the same position as shown from 100 to 300, and the No. 3 is the regular broadcast set and covers from 224 to 555 metres. All of these coils cover their respective bands when tuned with a .0005 mfd. variable condensor.

These sets of coils may be purchased separately and the average builder will probably start off with the No. 3 or "broadcast band" set, so that broadcast concerts may be heard. As time goes on the No. 1 set may be obtained to listen in on the low-wave-length broadcasting stations used for rebroadcasting and also the amateurs carrying on traffic in the 40 and 80-metres channels. The No. 2 set may then be had if the builder is interested in code work, to be able to hear the amateurs sending on 200 metres.

The condensers used in this set are of the metal end plate variety and have a maximum capacity of .0005 mfd. They have a straight-line capacity curve except at the lower end of the capacity. Here the stator plates are cut away slightly so that the lower wave-length stations are separated a little further apart than the higher ones.

With the regular broadcast set of coils, the dials specified will be found to be perfectly satisfactory and the tuning quite easy. Those of you who have ever tuned a neutrodyne will understand just how these dials operate. If you expect to equip your set with the complete kit of coils it is suggested the vernier dials having a good reduction or three of the new straight-line frequency converter dials be used.

As you would naturally expect, the tuning becomes extremely sharp when the lower wave-length bands are worked. The vernier dials will really be a necessity with the 30 to 100 metre band. Of the various types available, it is suggested that the vernier, S. L. F. converter dials, be used with this wave-length range, as the stations will have a better dial spread, and it will be easier to tune in the lower end of the band.

The only other control on the set is the potentiometer. This is used to stabilize the radio frequency tubes and also may be used for a volume control.

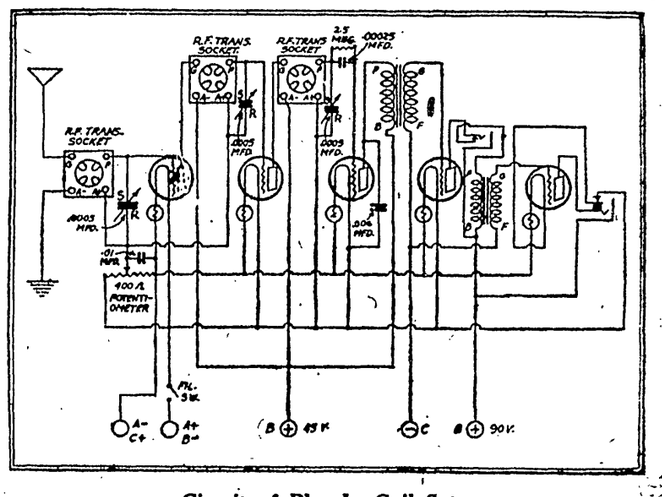
The filament temperature of all five tubes is regulated by a separate automatic filament control. This self-adjusting feature saves at least two manual controls and operates the tubes at their rated voltage. The tubes now available on the market are so uniform that this method of controlling the temperature is very practical and works the tubes at maximum efficiency.

The "A" battery current is turned on and off by a panel-type switch. The filament control jack in the last stage of audio lights the last tube when it is in use. When the phones or speaker are used in the first-stage jack the last tube is automatically turned off.

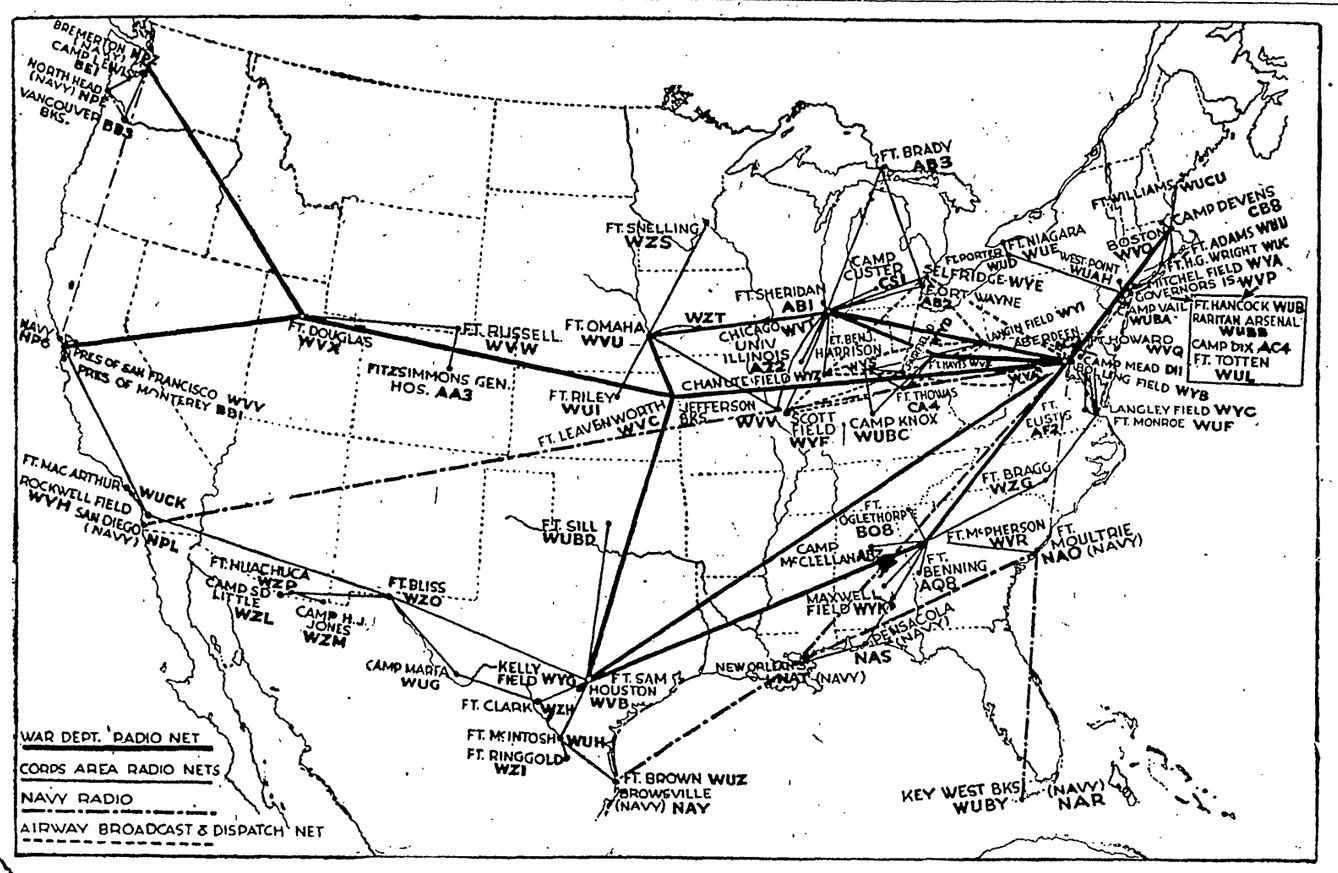
The audio couplers in this receiver are low-ratio transformers, and give very true reproduction of the broadcast concert. The circuit is standard in every respect, using the conventional "C" battery bias for the grids. If the builder wishes to experiment with more amplification, three of these transformers may be used and the output from the last fed into one of the new power tubes, or two standard tubes in parallel can be used.

The assembly of this set is not complicated and no trouble should be experienced if the general layout of the parts as here illustrated is followed. The wiring is easy and most of it can be placed beneath the subpanel. There are virtually no long leads in the set.

The tuning is similar to the general five-tube radio-frequency receiver, all of the dials reading about the same for any station. After a station has once been tuned in, the settings of the dials may be recorded for future reference. The potentiometer is used just below the point at which the radio-frequency tubes break into self-oscillation. Going below this point toward the positive side reduces the volume.



Circuit of Plug-In Coil Set



War Department Radio Net Covers United States

Vagrant Waves of Interest to Fans

Farmers own one-sixth of the radio sets in use in the United States.

A "wireless lighthouse" has been designed, which, instead of flashing light signals, flashes wireless warnings to navigators.

Forty laboratories throughout the United States are co-operating with the Bureau of Standards to study the cause and nature of fading.

Twenty-nine countries are buying radio sets and supplies from the United States. Japan is the leading customer, with Canada following.

Twelve of the principal broadcasting stations of the United States, from the Atlantic to the Pacific, have formed a chain and will start a simultaneous broadcasting of home service talks.

So that listeners in the Mid-West can tune for distant stations without interference, broadcasting stations in Chicago will be off the air on Monday nights.

Two air colleges, the University of Pittsburgh, over station KDKA, and station KSAC, Kansas State Agricultural College, will give a series of educational talks by radio this season.

An interesting radio experiment under consideration involves the crossing of the continent, from New York to San Francisco, by two automobiles, one controlled entirely by radio and the other the control unit.

According to a Federal law persons receiving commercial radio messages must not divulge or publish their contents, except to the person or persons to whom the message may be sent. Anyone who violates this order is liable to a fine of not more than $250 or imprisonment for no more than three months.

A short aerial allows sharp tuning in a single circuit set.

Iron masts for aerials should be insulated at the base to reduce current losses.

It is much better to build a set than to try to improve on a manufactured one.

An electric circuit is a combination of conductors through which electricity may flow.

Tubes are paralyzed by burning too bright or by using too high plate potential.

A counterpoise intended to be used as a substitute for a ground, need not be grounded.

A metal roof will reduce the volume of an indoor aerial, due to its absorbing part of the energy.

Excess wiring will cause a loss of signal strength, due to stray capacity. Keep wires short and far apart.

Bullfights in Spain are now broadcast by radio.

The radio industry in the United States employs 300,000 people in 1200 plants and 40,000 dealers' stores.

To-day's Programmes in Brief

For the convenience of radio fans, the following hourly schedule of broadcasting to-day is given in brief form, the complete programme being given under the regular listing of announcements. Figures following stations denote wave length.

The hours are based on Eastern Standard Time.

LOCAL STATIONS

9:45—Chimes, WDWF, 441.
10:45—Church, WEAN, 270.
1:30—Concert, WEAN, 270.
3:15—Festival Chorus, WJAR, 305.
4:00—Concert, WEAN, 270.
7:20—Church, WEAN, 270.
Concert, WJAR, 305.
9:15—Concert, WJAR, 305.

OUT-OF-TOWN STATIONS

7:55—Catholic services, WJJD, 302.
9:00—Children's hour, WJZ, 455.
10:00—Church, WOAW, 526.
Church, WMAK, 265.
10:30—Church, WQJ, 447.
Sunday school, WSB, 428.
Sunday school, WLW, 422.
10:40—Church, WJJD, 302.
10:45—Church, KYW, 536.
Church, WOO, 508.
10:50—Church, WNAC, 294.
Church, WEEI, 348.
Church, WBZ, 333.
11:00—Church, KDKA, 309.
Church, WCAP, 469.
Church, WHAS, 400.
Church, WJZ, 455.
Church, WMCA, 341.
Church, WGY, 379.
Church, WBCN, 266.
Church, WWJ, 352.
11:45—Church, WSB, 428.
11:50—Church, WCCO, 416.
12:00—Church, WLW, 422.
12:30—Organ, WHN, 361.
Orchestra, WGY, 379.
Orchestra, WJZ, 455.
1:00—Church, KFI, 467.
Church, KNX, 337.
Church, KOA, 322.
1:30—Concert, WBBM, 226.
1:55—Church, KGW, 491.
2:00—Orchestra, WLIT, 394.
Orchestra, WWJ, 352.
U. E. Service, WHN, 361.
Concert, WOC, 484.
Church, WEAF, 492.
Church, KFI, 467.
Church, KGO, 361.
2:15—Sacred recital, WHAR, 275.
2:50—Organ, WEEI, 348.
Forum, WJZ, 455.
Sunday school, WOO, 508.
Concert, WOAW, 526.
2:45—Sermon, WHAR, 275.
3:00—Sacred concert, WENR, 266.
Vespers, WGR, 319.
Concert, WGY, 379.
Conference, WEAF, 492.
Forum, WNAC, 280.
Organ, WPG, 299.
Church, WHN, 361.
3:30—Chapel, KYW, 536.
Concert, WEAR, 389.
Orchestra, WCBS, 316.
Address, WJZ, 455.
3:45—Dr. S. Parkes Cadman, WCAE, 461; WEAF, 492; WEEI, 348; WSAI, 326.
3:55—Vespers, WJZ, 455.
4:00—Organ, KDKA, 309.
Church, WCAP, 469.
Address, WIP, 508.
Concert, WJJD, 302.
Concert, WQJ, 447.
Organ, WLW, 422.
Special, WTAG, 268.
4:15—Community concert, WPG, 299.
4:45—Vespers, KDKA, 309.
5:00—Church, KNX, 337.
Musicale, KOA, 322.
Organ, WGY, 379.
Concert, WHBM, 226.
Blind Singer, WCAU, 277.
Concert, WBCN, 266.
Orchestra, WHN, 361.
5:10—Church, WCCO, 416.
5:30—Farmers' hour, WFAA, 476.
Evensong, WHAS, 399.
Concert, KYW, 536.
Literary Vespers, WJZ, 455.
6:00—Orchestra, WMCA, 341.
Organ, WOO, 508.
Concert, WSB, 428.
6:30—Concert, KDKA, 309.
Concert, KGO, 361.
Concert, WBAL, 280.
Concert, WCAE, 461.
Organ, WLIT, 394.
6:45—Orchestra, WCAU, 277.
7:00—Vespers, KFI, 467.
Concert, WBZ, 333.
Orchestra, WEAR, 389.
Carillons, WGY, 379.
Carillons, WJZ, 455.
Orchestra, WLIT, 394.
Orchestra, WMCA, 341.
Special, WOAW, 526.
7:15—Concert, KSD, 545.
Church, WIP, 508.
7:20—Concert, WCAE, 461; WCAP, 469; WEAF, 492; WEEI, 348; WTAG, 268; WWJ, 352.
Church, WCCO, 416.
7:30—Church, WGY, 379.
Church, WHN, 361.
Orchestra, WJZ, 455.
Church, WOC, 484.
Church, WMAK, 265.
Negro Spirituals, WBAL, 246.
Church, WSM, 282.
7:45—Church KDKA, 309.
Church, WGR, 319.
Song Service, WKRC, 422.
Orchestra, WCAU, 277.
Church, WLIT, 394.
7:50—Church, WHAR, 275.
8:00—Church, KYW, 536.
Forum, WBZ, 333.
Paulist Choristers, WLWL, 288.
Special, WMCA, 341.
8:15—Concert, WJY, 405.
8:30—Light Opera, WCAU, 277.
Church, WLW, 422.
8:45—Chimes, WSAI, 326.
Church, WSB, 428.
Church, WBCN, 266.
9:00—Comic special, WCAU, 27.
Studio programme, WGY, 379.
Classical concert, WHAR, 275.
Concert WPG, 299.
Orchestra, WQJ, 447.
Concert, WBBM, 226.
Organ, WBZ, 333.
9:15—Atwater Kent Artists, WCCO, 416; WCAE, 461; WCAP, 469; WEAF, 492; WEAR, 389; WEEI, 334; WGR, 319; WTAG, 268; WOC, 484; WOO, 508; KSD, 545; WSAI, 326.
9:30—Concert, WLW, 422.
Bible study, WFAA, 476.
Concert, WGBS, 316.
Special, KFI, 467.
Orchestra, WIP, 508.
9:45—Church, KOA, 322.
Tenor, WJZ, 455.
10:00—Organ, KFI, 467.
Church, KNX, 337.
Violinist, WGY, 379.
Special, WJY, 405.
Violinist, WJZ, 455.
Church, WOAW, 526.
Organ, WPG, 299.
10:15—Orchestra, WSAI, 326.
Hymns, WSUI, 483.
10:25—Church, KGW, 491.
10:30—Classical Concert, KYW, 536.
Popular music, WENR, 266.
Church, WFAA, 476.
Church, KGO, 361.
Church concert, WOC, 484.
10:45—Orchestra, WHN, 361.
10:50—Concert, WMCA, 341.
11:00—Concert, KFI, 467.
Orchestra, KNX, 337.
Classical music, WKRC, 422.
11:15—Organ, WHAR, 275.
11:30—Male quartet, WFAA, 476.
12:00—Orchestra, KFI, 467.
Special, KNX, 337.
Orchestra, WHN, 361.
Orchestra, KGW, 491.
12:30—Orchestra, WFAA, 476.
Dance music, WKRC, 326.
1:00—Orchestra, KFI, 467.
Orchestra, WBBM, 226.

RADIO PROGRAMMES

WJAR starts this week by broadcasting the concert of the Providence Festival Chorus this afternoon at 3:15 from the Albee Theatre. At 7:20 p. m., the usual New York programme, and at 9:15 the Atwater Kent artists will be heard. To-morrow afternoon at 1:15 the New England Old Fiddlers' contest will be broadcast, in addition to the regular numbers. Tuesday evening a talk, under auspices of the local Safety Council, will be heard at 8 o'clock. Wednesday the special feature will be a concert by Christ Church choir at 9:05 p. m., and a talk by a member of the Rhode Island Medical Society. Friday night another medical talk will be broadcast, and Saturday evening at 8 o'clock the entire programme of the seventh annual dinner of the Rhode Island Textile Association will be sent out.

WEAN has scheduled this morning's service of the Mathewson Street Methodist Church at 10:45, concerts at 1:30 and 4 o'clock, and the evening service of the First Church of Christ, Scientist, Boston, at 7:20. To-morrow its regular features will be heard, with the addition of the Malden Philharmonic Chorus at 10:30 p. m. Tuesday and Thursday afternoons at 4 o'clock John Fitzpatrick will be heard in organ recitals. Wednesday night at 8 o'clock the Oriental Band of Asir Sanctorium, No. 100, A. M. O. S., will be broadcast. Friday evening at 8 o'clock the Wollaston Glee Club will be heard. Saturday the various Shepard orchestras will be heard in dance music programmes.

WDWF will broadcast its chime concert and Bible reading at 9:45 this morning, and an organ recital by Chandler Goldthwaite at 4:45 this afternoon.

WLSI will broadcast feature programes Monday, Wednesday and Friday evenings.

WJAR, THE OUTLET CO., 305

To-day.

7:20 p. m.—Musical programme by Maj. Edward Bowes and the "Capitol Family."
9:15 p. m.—"Atwater Kent Radio Hour." Albert Spalding, violinist.
3:15 p. m.—Providence Festival Chorus concert, relayed from Albee Theatre. Miss Sophie Braslau, contralto, and John Campbell, tenor, will be the soloists of the concert. Programme: Christmas hymns, "Born To-day" (Sweelinck), "Lo, How a Rose" (Praetorius), "Break Forth, O Heavenly Light" (Bach), "Bethlehem" (old Spanish), "Silent Night" (solo by Thomas Owen) (Damrosch), the chorus; "O Come to Me, Beloved" (Bassani), "Furibondo" (Handel), Miss Braslau; recitation and air from opera "Joseph" (Mehul), "Rozen" (Allin), "Arlette" (Vidal), Mr. Campbell; "Around Us Hear the Sounds of Evening" (Dvorak), "Nocturne" (Cui), "Praise the Lord" (Gretchaninoff), the chorus; "Romance" ((Rubinstein), "Vocalise" (Rachmaninoff), "Dnieper" (Moussorgsky), Miss Braslau; "Earth Is Enough" (Warford), "Gargoes" (Dobson), "The Bitterness of Love" ((Dunn), "De Captaine of de Marguerite" (O'Hara), Mr. Campbell; "Bayou Ballads" (Monroe-Schindler), "Ah, Suzette," "Cradle Song," "When Your Potato's Done," "Consecration" (Manney), "As We Part" (Ligenfritz), Miss Braslau; "Ring Out, Wild Bells" (Damrosch), the chorus. Miss Louis Lindner will accompany Miss Braslau on the piano. Beatrice Warden Roberts will play Mr. Campbell's accompaniments.

Monday.

10:00 a. m.—Housewives' Radio Exchange. A department conducted by Mrs. Wood on all matters of household interest. All questions submitted will be answered by radio.
1:05 p. m.—Studio programme.
1:30 p. m.—Weather report.
1:30 p. m.—All New England Old Time Fiddlers' contest, under the auspices of the Town Criers, relayed from the Providence Biltmore Hotel, broadcasting through the courtesy of the Albee Theatre.
8:00 p. m.—Joint recital by Alice and Louise McLaughlin.
8:05 p. m.—Fairlawn Entertainers.
9:00 p. m.—A. & P. Gypsies.
10:00 p. m.—Grand opera, "Mignon."

Tuesday

1:05 p. m.—Providence Biltmore Concert Orchestra from the hotel under the direction of Erwin White.
1:30 p. m.—Weather report.
7:30 p. m.—Yacht Club Orchestra.
8:00 p. m.—One of the series of safety talks under the auspices of the Providence Safety Council.
8:30 p. m.—Gold Dust Twins.
9:00 p. m.—"Everyeady Hour."
10:00 p. m.—Al Mitchell and his Roseland Orchestra.

Wednesday

10:00 a. m.—Housewives Radio Exchange. A department conducted by Mrs. Wood on all matters of household interest. All questions submitted will be answered by radio.
1:05 p. m.—Programme under the direction of Mlle. Reina Farlardeau.
1:30 p. m.—U. S. Weather Bureau report.
7:30 p. m.—The Tennesseans Dance Orchestra.
8:00 p. m.—Mariano Melendez, Cuban tenor, accompanied by Rafael Betancourt.
8:30 p. m.—Joint recital by Mr. and Mrs. Arthur E. Gonyea.
9:00 p. m.—Choir of Christ Church under the direction of Irene Sweetser Simone.
9:05 p. m.—Choir of Christ Church under the direction of Irene Sweetser Simone.
9:00 p. m.—One of the series of health talks under the auspices of the Rhode Island Medical Society.
9:50 p. m.—Flint Grinnell, manager Providence Better Business Bureau, will talk on "Better Business Activities."
10:00 p. m.—"Roxy (S. L. Rothafel) and his Gang."

Thursday

1:05 p. m.—Studio programme.
1:30 p. m.—Weather report.
7:45 p. m.—One of the series of "Nature Talks" under the auspices of the Park Museum, Roger Williams Park, Providence, to be given by W. L. Bryant.
8:00 p. m.—Robert W. Powers's Hudson-Essex Orchestra.
9:00 p. m.—Cliquot Club Eskimos.
10:00 p. m.—"Goodrich Zippers."

Friday

10:00 a. m.—Housewives Radio Exchange. A department conducted by Mrs. Wood on all matters of household interest. All questions submitted will be answered by radio.
1:05 p. m.—Woodstock Entertainers.
1:30 p. m.—Weather report.
7:30 p. m.—"What Happened at Sir Hobgoblin's Forge" by Blanche Elizabeth Wade, story teller for G. R. Kinney Company.
7:45 p. m.—Musical programme, Bessie Sanderson, contralto.
8:20 p. m.—One of the series of health talks under the auspices of the Rhode Island Medical Society. Subject: "Milk."
8:30 p. m.—"German's Jolly Bakers."
9:00 p. m.—"Hohner Harmony Hour."
11:00 p. m.—Providence Biltmore Dance Orchestra under the direction of Erwin White, relayed from the dining room of the Providence Biltmore Hotel.

Saturday

1:05 p. m.—Zikes Bon Ton Orchestra.
1:30 p. m.—Weather report.
8:00 p. m.—Seventh annual dinner of the Rhode Island Textile Association, relayed from the ball room of the Providence Biltmore Hotel. Programme: Call to order by Jesse H. Metcalf, United States Senator from Rhode Island; introduction of new president; presentation of "historic gavel" to the Rhode Island Textile Association by Henry C. Dexter, president of the Old Slater Mill Association; reply by the president; presentation by William B. MacColl, president of the National Association of Cotton Manufacturers; welcome to the State extended to guests by Lieutenant Governor Nathaniel W. Smith; preliminary remarks by Senator Jesse H. Metcalf; John S. Lawrence, president pro tem. of the United States Senate, United States Senator from New Hampshire.

WEAN—THE SHEPARD STORES—270

To-day.

10:45 a. m.—Service of the Mathewson Street M. E. Church.
1:30 p. m.—Concert.
4:00 p. m.—Boston Square and Compass Club, concert, Boston.
7:20 p. m.—Service of the First Church of Christ, Scientist, Boston.

Monday.

11:55 a. m.—Time signals.

Continued on Page Thirteen.

RADIO PROGRAMMES

Continued from Page Twelve.

12:00 p. m.—Shepard Colonial Concert Orchestra, Harold Sheffers, director.
12:30 p. m.—Weather report.
12:35 p. m.—Musical programme.
4:00 p. m.—Musical programme.
4:30 p. m.—Weather report.
4:35 p. m.—Musical programme.
6:30 p. m.—WEAN dinner dance, Shepard Colonial Dance Orchestra, Harold Sheffers, director.
8:00 p. m.—Musical score from the annual show of Pel Eta Club of Harvard University.
8:25 p. m.—Broadcast from New Metropolitan Theatre, overture by the Metropolitan Grand Orchestra, Boston.
9:45 p. m.—Orchestra.
10:20 p. m.—Malden Philharmonic Chorus, Henry Gideon, conductor; excerpts from the new musical drama, by Humphrey J. Stewart, "The Hound of Heaven," Boston.

Tuesday.

10:00 a. m.—Home service talks by Miss Kathleen Atkinson.
11:55 a. m.—Time signals.
12:00 p. m.—Concert orchestras of The Shepard Colonial Restaurants.
12:10 p. m.—Weather report.
12:15 p. m.—Musical programme.
4:00 p. m.—Organ recital by John Fitzpatrick, broadcast from the Mathewson Street M. E. Church.
4:30 p. m.—Weather report.
6:30 p. m.—Dinner dance.
7:30 p. m.—"Maine, Its Advantages and Possibilities."
8:00 p. m.—Musical programme.
10:00 p. m.—Radio auction bridge, by Wilbur C. Whitehead, John H. Smith, Milton C. Work, A. J. Ferres.

Wednesday.

11:55 a. m.—Time signals.
12:00 p. m.—Shepard Colonial Concert Orchestra.
12:10 p. m.—Weather report.
12:15 p. m.—Musical programme.
4:00 p. m.—Musical programme.
4:30 p. m.—Weather report.
4:30 p. m.—Talk by Grace Angell.
6:30 p. m.—Dinner dance.
7:30 p. m.—"Proper Care of the Skin," E. J. Moseley of England.
8:00 p. m.—Oriental Band of Asir Sanctorium, No. 160, A. M. O. S.
9:30 p. m.—Dance music, Rhodes Orchestra, Charles E. Culverwell, director, broadcast from Rhodes-on-the-Pawtuxet.

Thursday.

10:00 a. m.—Home service Talks by Miss Kathleen Atkinson.
11:55 a. m.—Time signals.
12:00 p. m.—Shepard Colonial Concert Orchestra, Harold Sheffers, director.
12:10 p. m.—Weather report.
12:15 p. m.—Musical programme.
4:00 p. m.—Musical programme.
4:30 p. m.—Weather report.
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8:25 p. m.—Broadcast from New Metropolitan Theatre, overture by the Metropolitan Grand Orchestra, Boston.
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12:10 p. m.—Weather report.
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4:00 p. m.—Organ recital by John Fitzpatrick, broadcast from the Mathewson Street M. E. Church.
4:30 p. m.—Weather report.
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4:00 p. m.—Organ recital by John Fitzpatrick, broadcast from the Mathewson Street M. E. Church.
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11:55 a. m.—Time signals.
12:00 p. m.—Concert orchestras of The Shepard Colonial Restaurants.
12:10 p. m.—Weather report.
12:15p. m.—Musical programme.
4:00 p.m.—Musical programme.
4:00 p. m.—Shepard Colonial Dance Orchestra.
4:30p.m.—Weather report.
6:30 p. m.—Shepard Colonial dinner dance, direction Billy Losee.
8:00 p. m.—American Composers' Night.
9:00 p. m.—Varied programme.

WDWF—DUTEE W. FLINT—441.

To-day.

9:45 a. m.—Chimes and Bible reading.
4:45 p. m.—Organ recital by Chandler Goldthwaite.

WLSI—LINCOLN STUDIOS—441.

Monday.

8:30 p. m.—Lamson oil hour.

Wednesday.

3:00 p. m.—Biltmore Market hour.
9:00 p. m.—D. W. Flint oil hour.

Friday.

8:30 p. m.—Ford Radio hour.

OUT OF TOWN STATIONS

To-Day

WHN—NEW YORK—361.

12:30-1:00 p. m.—Organ recital.
2:00 p. m.—Queens County Christian Endeavor programme.
3:00 p. m.—Calvary Baptist Church services.
5:00 p. m.—Dance Orchestra.
7:30 p. m.—Calvary Baptist Church services.
10:45 p. m.—Orchestra.
12:00 p. m.—Orchestra.

KDKA—EAST PITTSBURGH—309.

11:00 a. m.—Church services.
4:00 p. m.—Organ recital.
4:45 p. m.—Vesper service of the Shadyside Presbyterian Church, Pittsburgh.
6:30 p. m.—Dinner concert.
7:45 p. m.—Church service.

KFI—LOS ANGELES—467.

1:00 p. m.—Morning services under the direction of the Los Angeles Church Federation.
2:00 p. m.—Morning services of Third Church of Christ, Scientist.
7:00 p. m.—Vesper services.
9:30 p. m.—Special.
10:00 p. m.—Organ.
11:00 p. m.—Classic Hour.
12:00 a. m.—Musical programme.
1:00 a. m.—Packard Six Orchestra.

KGO—OAKLAND—361.

2:00 p. m.—Service of the First Presbyterian Church, San Francisco.
6:30 p. m.—Concert, Little Symphony Orchestra.
10:30 p. m.—Service of the First Presbyterian Church, San Francisco.

KGW—PORTLAND—491.

1:55 p. m.—Church.
10:25 p. m.—Church.
12:00 a. m.—Orchestra.

KNX—LOS ANGELES—337.

1:00 p. m.—First Presbyterian Church of Hollywood.
5:00 p. m.—City Park Board musical programme.
10:00 p. m.—First Presbyterian Church of Hollywood.
11:00 p. m.—Concert orchestra.
12:00 a. m.—Feature programme.

KOA—DENVER—322.

1:00 p. m.—Service of First Baptist Church.
5:00 p. m.—Afternoon music hour.
9:45 p. m.—Service of First Baptist Church, Denver.

KSD—ST. LOUIS—545.

7:15 p. m.—Orchestra.
9:15 p. m.—Atwater Kent Hour.

KYW—CHICAGO—536.

11:45 a. m.—Central Church service from Orchestra Hall, Rev. Frederick F. Shannon, pastor.
3:30 p. m.—Studio chapel service, under the direction of the Chicago Church Federation.
5:30 p. m.—Studio concert.
8:00 p. m.—Chicago Sunday Evening Club service from Orchestra Hall, Chicago.
10:30 p. m.—Classical concert.

WBAL—BALTIMORE—246.

6:30 p. m.—Twilight programme.
7:30 p. m.—Negro spirituals.

WBBM—CHICAGO—226.

1:30 p. m.—Classical concert of vocal music.
5:00 p. m.—Orchestra.
9:00 p. m.—Vocal and orchestra music.
1:00 a. m.—Orchestra.

WBCN—CHICAGO—266.

11:30 a. m.—Morning service from People's Liberal Church.
5:00 p. m.—Classical concert; Oriental Male Quartet; Velma Cook, soprano; Robert Stronach, organist.
8:50 p. m.—Evening service from Thoburn M. E. Church, with 40-piece semi-symphony orchestra, 80-voice choir, special speaker and congregational singing.

WBZ—SPRINGFIELD—333.

10:50 a. m.—Church services.
7:00 p. m.—Sunday evening dinner concert.
8:00 p. m.—To be announced.
9:00 p. m.—Organ.

WCAE—PITTSBURGH—461.

2:45 p. m.—Dr. S. P. Cadman address.
6:30 p. m.—Dinner concert.
7:20 p. m.—Capitol Theatre Gang, New York.
9:15 p. m.—Atwater Kent hour.

WCAP—WASHINGTON—469.

11:00 a. m.—Service of Petworth M. E. Church.
4:00 p. m.—Service of Bethlehem Chapel, Washington Cathedral.
7:20 p. m.—Musical programme from the Capitol Theatre.
9:15 p. m.—"Atwater Kent Radio Hour."

WCAU—PHILADELPHIA—277.

5:00 p. m.—Robert Fraser—the blind gospel singer.
5:15 p. m.—Undenominational Radio Church service.
6:45 p. m.—Orchestra.
7:45 p. m.—Concert orchestra.
8:30 p. m.—Bonwit Teller Light Opera Company.
9:00 p. m.—Potash and Perlmutter.

WEAF—NEW YORK—492

2:00 p. m.—Sunday radio service under the auspices of the Greater New York Federation of Churches.
3:00 p. m.—Young People's Conference under the auspices of the Greater New York Federation of Churches direct from Marble Collegiate Church.
4:00 p. m.—Men's Conference in the Bedford Branch, Y. M. C. A., Brooklyn.
7:20 p. m.—Musical programme by Maj. Edward Bowes, and the "Capitol Family."
9:15 p. m.—"Atwater Kent Radio Hour"—Albert Spalding, violinist.

WEAR—CLEVELAND—389.

3:30 p. m.—Afternoon musicale.
7:00 p. m.—Orchestra.
7:30 p. m.—International programme by city of Cleveland from public auditorium.
9:15 p. m.—Atwater Kent Hour.

WENR—CHICAGO—266.

3:00 p. m.—Sacred selections.
10:30 p. m.—Popular programme.

WEEI—BOSTON—348

10:50 a. m.—Service of Old South Church.
2:30 p. m.—Chamber of Commerce organ.
3:45 p. m.—Dr. S. Parkes Cadman.
7:20 p. m.—Maj. Bowes and His Capitol Family.
9:15 p. m.—Atwater Kent hour.

WCCO—MINNEAPOLIS—416.

11:50 a. m.—Westminster Presbyterian Church, Minneapolis.
5:10 p. m.—House of Hope Presbyterian Church, St. Paul.
7:20 p. m.—Second Church of Christ, Scientist, Minneapolis.
8:15 p. m.—Atwater Kent programme.

WFAA—DALLAS—475.

5:30 p. m.—Sunday hour for farmers.
9:30 p. m.—Radio Bible Class.
10:30 p. m.—Services of the First Baptist Church.
11:30 p. m.—Willard B. Muse, tenor, with assisting musicians.
12:30 a. m.—Orchestra.

WGBS—NEW YORK—316.

3:30 p. m.—Dance Orchestra.
9:30 p. m.—Isidore Gorn, concert pianist, and Philip Morrel, violin virtuoso, sonatas. Mme. Gloria Darana, dramatic soprano, and William A. Williams, tenor.

WGR—BUFFALO—319.

3:00 p. m.—Concert by the Heidelbert University Male Glee Club.
7:45 p. m.—Service, direct from the Central Presbyterian Church.
9:15 p. m.—Atwater-Kent radio hour.

WGY—SCHENECTADY—379.

11:00 a. m.—Service of St. George's Episcopal Church.
12:30 p. m.—Sunday Symphonic Society.
8:00 p. m.—Special programme.
6:00 p. m.—Organ recital by Dr. Frank Sill Rogers, assisted by T. Roy Keefer, violinist; broadcast from St. Peter's Episcopal Church, Albany, N. Y.
7:00 p. m.—Carillon programme.
7:30 p. m.—Service of St. George's Episcopal Church.
9:00 p. m.—Programme.
10:00 p. m.—Godfrey Ludlow, violinist.

WHAR—ATLANTIC CITY—275.

10:45 a. m.—Service, Chelsea Baptist Church.
2:15 p. m.—Short Sacred Recital.
2:45 p. m.—Sermon, Rev. George W. Yard, pastor of Central M. E. Church.
7:50 p. m.—Service of Chelsea Baptist Church.
9:00 p. m.—Quartette, "An Hour with the Classics."
11:15 p. m.—Organ.

WHAS—LOUISVILLE—399.

11:00 a. m.—Service of the Fourth Avenue Presbyterian Church.
5:30 p. m.—Evening choral service, from Christ Church Cathedral.

WIP—PHILADELPHIA—508.

4:00 p. m.—"Making Humans Whole." Religious talk by Prof. Arthur Holmes, of the University of Pennsylvania.
7:15 p. m.—Service of Holy Trinity Church.
9:30 p. m.—Symphony Orchestra.

WJJD—MOOSEHEART—370.

8:45 a. m.—Catholic services at Mooseheart.
10:40 a. m.—Protestant services at Mooseheart.
4:00 p. m.—Mooseheart Sunday concert.

WJY—NEW YORK—405.

8:15 p. m.—Concert orchestra.
10:00 p. m.—Special.

WJZ—NEW YORK—455.

9:00 a. m.—Children's hour.
11:00 a. m.—West End Presbyterian Church services.
12:30 p. m.—Sunday Symphonic Society.
2:30 p. m.—Sunday Radio Forum.
3:30 p. m.—Trio.
3:55 p. m.—Vesper services of St. George's Church.
5:45 p. m.—"The Yoke of Yesterdays," Edgar White Burrill's Literary Vespers.
7:00 p. m.—Carillon of Park Avenue Baptist Church.
7:30 p. m.—Concert orchestra.
9:15 p. m.—Alexander Brachocki, pianist.
9:45 p. m.—Max Kaltus, tenor.
10:00 p. m.—Godfrey Ludlow, violinist.

WKRC—CINCINNATI—326

7:45 p. m.—Church service, Walnut Hills Christian Church.
11:00 p. m.—Classical programme, vocal and instrumental numbers by Cincinnati Conservatory, college students.
12:30 a. m.—Dance programme.
1:00 a. m.—Midnight, popular midnight programme.

WLIT—PHILADELPHIA—394.

2:00 p. m.—Concert orchestra.
6:30 p. m.—Organ.
7:00 p. m.—Concert orchestra.

WLW—CINCINNATI—422.

10:30 a. m.—Sunday school.
11:45 a. m.—U. S. weather forecast, market reports and river stages.
12:00 p. m.—Morning worship of the Seventh Presbyterian Church.
4:00 p. m.—Organ recital by C. Hugo Grimm featuring favorite hymns.
8:30 p. m.—Services of the First Presbyterian Church of Walnut Hills.
9:30 p. m.—Concert programme.

WLWL—NEW YORK—288.

8:00 p. m.—Paulist Choristers.

WMAK—LOCKPORT—265.

10:23 a. m.—Service of First Presbyterian Church, Lockport.
7:30 p. m.—Service of Churchill Tabernacle, Buffalo.

WMCA—NEW YORK—341.

11:00 a. m.—Services of the Fifth Church of Christ, Scientist of Brooklyn.
6:00 p. m.—Special.
7:00 p. m.—Orchestra.
8:00 p. m.—Hugo Zeller, talk on "Lacquer."
8:05 p. m.—Orchestra.

WOAW—OMAHA—526.

10:00 a. m.—Chapel service.
2:30 p. m.—Matinee programme.
7:00 p. m.—Mrs. Carl R. Gray.
10:00 p. m.—Chapel service.

WOC—DAVENPORT—484.

2:00 p. m.—Orchestra concert.
7:30 p. m.—Church service.
9:15 p. m.—"Atwater Kent Radio Artists."
10:45 p. m.—Musical programme. The Congregational Church of Genesco, Ill.

WOO—PHILADELPHIA—508.

10:45 a. m.—Services of Bethany Presbyterian Church.
2:30 p. m.—Bethany Sunday school.
6:00 p. m.—Sacred organ recital.

WPG—ATLANTIC CITY—299.

3:15 p. m.—Organ recital.
4:15 p. m.—Community vocal and instrumental recital, St. James's Episcopal Church.
9:00 p. m.—Orchestra.
10:00 p. m.—Organ recital.

WQJ—CHICAGO—447

10:30 a. m.—The sermon and services of the People's Church at the Pantheon Theatre.
4:00 p. m.—Sunday afternoon musical programme.
9:00 p. m.—Orchestra.

WSAI—CINCINNATI—326.

3:45 p. m.—Address by Dr. S. Parkes Cadman.
8:45 p. m.—Chime concert and sermonette.
9:15 p. m.—"Atwater Kent Hour."
10:15 p. m.—Orchestra.

WSB—ATLANTA—428.

10:30 a. m.—Agoga Sunday school programme from Baptist Tabernacle.
11:45 a. m.—First Presbyterian Church service.
6:00 p. m.—Musical programme
8:45 p. m.—Wesley Memorial Church service.

Buy On Our Gradual Payment Service

and pay as little as $2 weekly after small down payment.

BROADCASTING STATION W J A R

The Outlet Company

Our Guarantee

Each set fully guaranteed, with free service for six months if we install it. We maintain a large and thoroughly trained service force to care for every set we sell and install. A modest charge for installation.

The Arrival of New Shipments Enables Us to Resume This Great Radio Offer

The New *David Grimes* 5-Tube Radio Set

$69.97

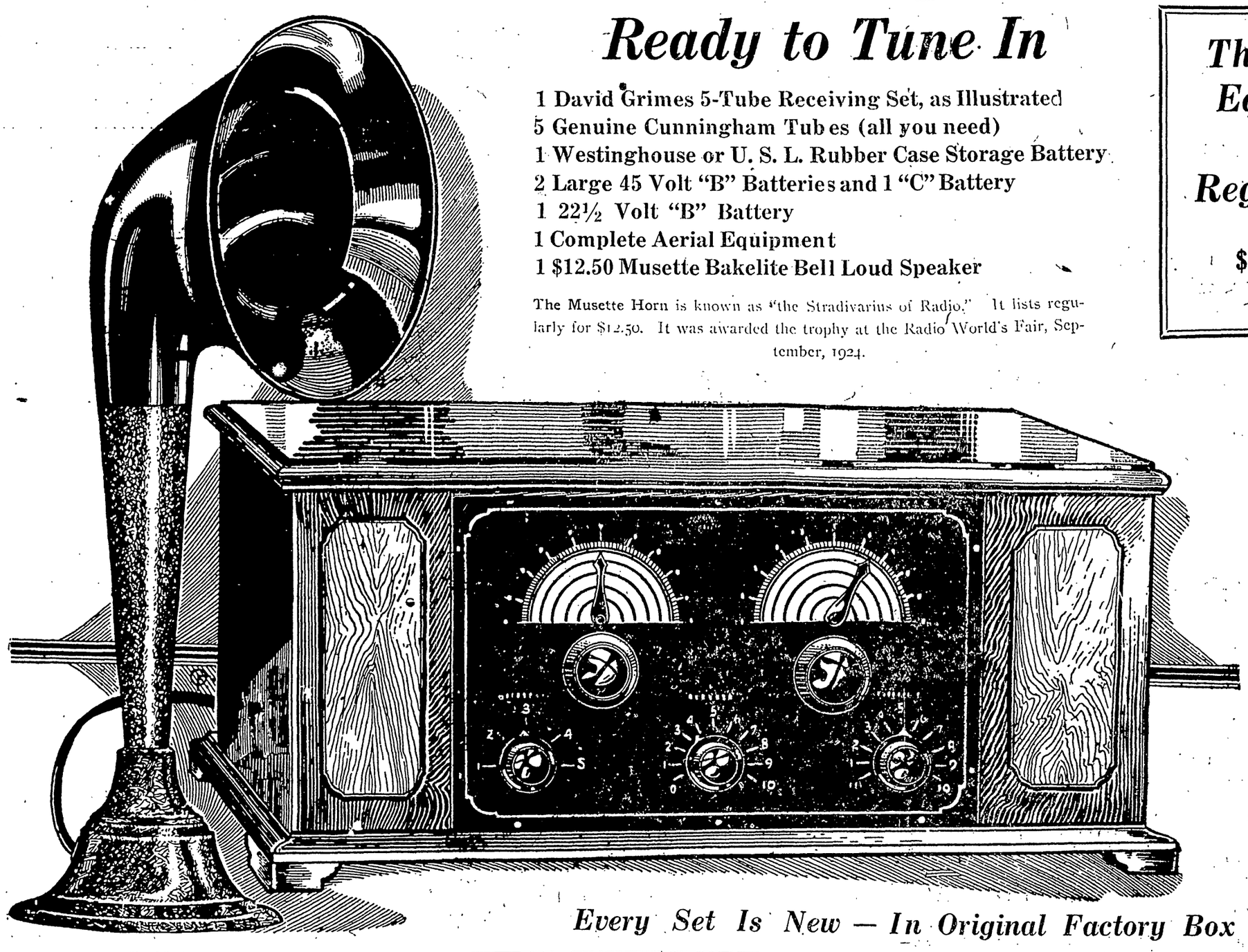
Set Without Equipment $39

A New Set—Not an Obsolete Model

The overwhelming response to this event quickly exhausted our first allotment. Hundreds of favorable comments and words of praise have been received from those who have purchased these sets, which clearly indicates their popularity.

Having received our second allotment, we are now prepared for another great response which this announcement is sure to bring—If you are contemplating the purchase of a new radio set, don't fail to take advantage of this opportunity.

This Is What You Get Complete For $69.97



Ready to Tune In

1 David Grimes 5-Tube Receiving Set, as Illustrated
5 Genuine Cunningham Tubes (all you need)
1 Westinghouse or U. S. L. Rubber Case Storage Battery
2 Large 45 Volt "B" Batteries and 1 "C" Battery
1 22½ Volt "B" Battery
1 Complete Aerial Equipment
1 $12.50 Musette Bakelite Bell Loud Speaker

The Musette Horn is known as "the Stradivarius of Radio." It lists regularly for $12.50. It was awarded the trophy at the Radio World's Fair, September, 1924.

The Set and Equipment Sells Regularly for $113

You Can Buy This Set on Our Gradual Payment Service as low as $2 Weekly

Every Set Is New — In Original Factory Box

The Great Number of Sets Sold—Proof of Value

Of course it was unusual for a manufacturer to give us such a supply, as he is sacrificing his profit for this eventful opening value, and charging it to advertising—for advertising it will be—for every person that buys one will be its best salesperson and ardent enthusiast—so come early if you want one. This set has a record for receiving distant stations, those far away come in distinctly and clear as a bell.

We Invite You to Our Radio Department

A spacious department that has most every kind, size and make of radio receiving set on display. Then also there is the tested and approved radio equipment, without which no radio department would be complete. Certainly a splendid department—one that we take pride in and we hope will make lasting friends with its quality merchandise and satisfactory service that is the keynote of all Outlet customer relationship.

A New Set—Not An Obsolete Model

One of the very finest 5-tube sets that has appeared on the market this year. You can tell the moment you look at it that this is no ordinary radio set—the beautiful hardwood cabinet with mahogany finished overlay panels and the shielded black metal panel front handsomely engraved and emblazoned in copper—is unusual in itself. The moment you feel the velvety fine precision tuning of the dials you know that here is as fine a 5-tube set as money can buy.

Grimes Sets Are Advertised The Country Over

Guaranteed by the Makers and Ourselves

You will remember the signs reading "David Grimes Radio—A Contribution to Civilization." Also among other signs, the one reading, "It's Here! The New David Grimes Radio Sensation."
The set featured in this event is one of the leading radio sets manufactured by this famous maker.

$69.97

The Outlet Company