

HIS VOICE TO REACH ALL OVER COUNTRY



President Coolidge will be the first president of the United States ever to have had his inaugural ceremonies broadcast. On March 4 over thirty stations located from coast to coast, a record-breaking chain of broadcasters, will give the inauguration program simultaneously direct from Washington. The above photo was taken when he broadcast a speech some time ago at a banquet in New York.

BROADCAST INAUGURAL

(Continued from page 1)

wire lines transmit the program to WJZ, its New York station, and WGY, the Schenectady station of the General Electric company, for broadcasting at those points.

Probable Stations to Broadcast

The usual A. T. & T. link, consisting of Stations WCAP, WJAR, WEEL, WDBH, WGR, WCAE and WFI, will undoubtedly carry the inaugural program. Many other stations will be tied in besides.

The Westinghouse group of WBZ, KDKA, KYW and KFKX are almost certain to be included. KOA and KGO, Denver and Oakland stations respectively of the General Electric company, are also fairly sure to be in the link.

More than sixteen other 500-watt broadcasters located in every part of the country are negotiating for the privilege of sharing a part of the expense and carrying the ceremonies on March 4.

The final list of participating stations will be announced just prior to the event.

To the Radiophan of today the fact that a public address loud speaker system is to be installed means but little. Four years ago, however, it marked an epoch-making event in the history of voice transmission. Newspapers throughout the country on the evening of March 4, 1920, and the following day carried the headlines, "125,000 People Hear Harding's Voice," "A Telephone Achievement Ranking with the Opening of the Transcontinental Line," and then proceeded to tell the story of how, "with the aid of the Bell loud speaker, installed at Washington by engineers of the Bell system, President Harding addressed the greatest number of people that has ever listened to one man's voice at one time in the history of the world."

People throughout the land were amazed when they learned that on this inauguration day the voice of President Harding was clearly heard and understood by a crowd of 125,000 people, a crowd that completely filled the plaza in front of the capitol and overflowed into the park beyond.

Today this same equipment acts as an aid to bring the voice of the President of the United States not to 125,000 but to several millions. It is this equipment, combined with the use of the long distance telephone lines of the Bell system and Radio relays, that brings the human voice to many stations for broadcasting.

Australia Hears Complete Program from Pittsburgh

E. PITTSBURGH, Pa.—Station KDKA, Westinghouse company here, recently reached several cities in Australia with a complete program. A cablegram received here told of the success of the test. The steamship distance to Sydney is about 9,000 miles.

Arrangements for the test were made between the Westinghouse company and The Melbourne Herald. The hour was from 5 to 6 a. m., eastern time, which corresponds with 8 to 9 p. m. at night in Australia, there being a difference of fifteen hours in time.

THEATRICAL LIGHTS GIVE RADIO ALARM

WHILE MOVIE MANAGERS INDORSE BROADCASTS

Actors' Equity Organizes Committee to Discuss Radiocast Competition and Other Problems

NEW YORK. — Representatives of actors, managers, dramatists, composers, scenic artists, publishers, stage hands and musicians—leading lights of the theatrical world—sounded a Radio alarm recently when they met together here for the first time in history to form a committee to make plans for the "betterment of the institution to which we all belong."

Radio broadcasting and its relation to the theater, discussed pro and con, mostly con, for two hours was named as the first matter for the committee to handle.

The Actors' Equity association is the moving spirit behind the organization of the new committee of the theater. Although many other problems are said to be ready for discussion by the proposed committee, none of these has been named. Radio's so-called competition with the spoken play is of chief interest.

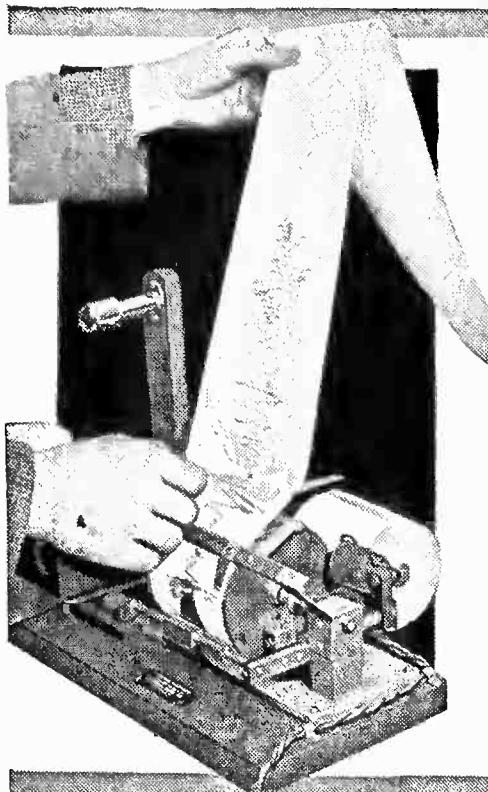
Movie Managers Indorse Radio

While the Actors' Equity in New York was sponsoring the call to arms against Radio, down in Atlanta, Georgia, the Famous Players-Lasky theater managers from all parts of the United States and Canada in convention assembled unanimously indorsed Radio broadcasting as an influence beneficial to the growth and prosperity of the silent drama.

The motion picture theater managers further declared themselves in favor of a policy of close co-operation between theater directors and broadcasting stations.

The meeting was attended by Jesse L. Lasky, production manager of the organization, and Harold B. Franklin, head of the theater department. Lambdin Kay, director of WSB, the Atlanta Journal station, spoke in behalf of broadcasting.

FADING RECORDER IS AID TO ECLIPSE TEST



The apparatus pictured is a fading recorder and was used by the Radio Corporation of America in the recent Radio eclipse tests in New York city to make a permanent record of the effect the eclipse had on Radio signals of various wave lengths. If signals came in always with the same strength the result would be a straight line on the paper tape. Note the wavy line on the tape.

Union College, Schenectady, 2XQ, recently held two-way Radiotelegraph communication with G. Marcuse, England, 2NM.

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Radio Digest, Illustrated, Volume XII, Number 6, published Chicago, Illinois, February 14, 1925. Published weekly by Radio Digest Publishing Company, 510 N. Dearborn Street, Chicago, Illinois. Subscription rates, yearly, Five Dollars; Foreign Postage One Dollar additional; single copies Ten Cents. Entered as second class matter at the postoffice at Chicago, Illinois, under the Act of March 3, 1879.

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Looking Ahead

"Uncle John" Daggett, KHJ Director-Announcer, and his almost equally famous staff, including "Kindness," "Happiness" and "Joy," will be pictured next week, together with the station of the Los Angeles Times. Read about beloved "Uncle John" and his broadcasting ideals in the next issue of Radio Digest.

Tuning and Trouble Shooting the Knox Reflex will be the third part of the series by W. H. H. Knox. Readers that have built this improved reflex will find the tuning not at all complicated and errors in assembly can be easily located.

Antenna and Ground Requirements are treated by Mr. Jones in the next issue in a way that is distinctly new. Antenna circuit resonance and some pointers on securing selectivity are not usually included in articles of this type.

An Easily Made Quick Reference Station Directory which enables readers to use the lists printed in Radio Digest without searching through several copies will be presented by David J. Morris. Compactness and low cost are other factors which recommend it.

Newsstands Don't Always Have One Left

WHEN YOU WANT

Radio Digest

YOU WANT IT!

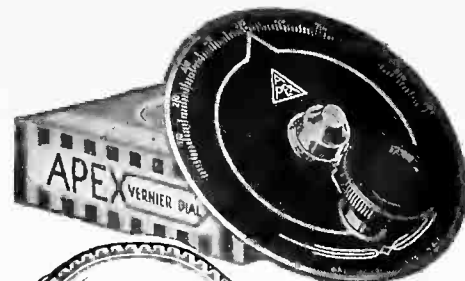
BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW

SEND IN THE BLANK TODAY

Publisher Radio Digest, 510 N. Dearborn St., Chicago, Illinois.

Please find enclosed check M. O. for Five Dollars (Six, Foreign) for One Year's Subscription to Radio Digest, Illustrated.

Form with fields for Name, Address, and City/State.



MORE DISTANT STATIONS

WITH THE APEX VERNIER DIAL

Greater range, bigger volume, finer selectivity, less interference. Lasts forever. The one big advance yet made in tuning. Ratio 12 to 1.

Quickly applied to any shaft.

For sale by all good Radio Dealers.

If unable to obtain from dealer, enclose

\$2.00 for Royal Braes Finish.

\$2.50 for Satin Silver Finish.

\$3.50 for De Luxe Gold Plated Finish.

The Apex Super Five

is a tuned radio frequency receiver of the highest type. Built into a highly finished walnut cabinet—complete with Jones Multiple Battery Cable—all settings highly gold plated. List price \$95.00 complete.

7 Tube Microdyne Super-Heterodyne for \$97.50

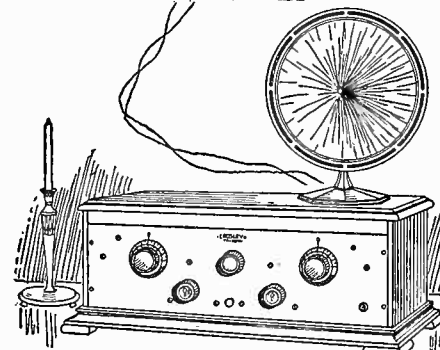
Receive the parts complete to assemble your set. Coast to coast on an 18 in. loop. Assemble this 7-tube Microdyne Super-Heterodyne on a 7 x 18 in. panel in 3 hours. Parts complete. Price of cabinet, to fit, on application. If your radio dealer cannot supply, send name of dealer.

RADIO JOBBERS: Some very profitable Apex Radio Territory still available. Write or wire immediately.

RADIO DEALERS: Apex Radio Products have the call today. Write for profitable sales plan at once.

Apex Electric Mfg. Co. 1414 West 59th Street Chicago

CROSLEY AGAIN LOWERS PRICES



Big Reduction in Famous TRIRDYN and other Radios CROSLEY TRIRDYN SPECIAL

THE biggest selling high grade receiver on the market—the Crosley Trirdyn—reduced from \$65 to \$50. \$60

The Trirdyn Special—the beautiful Model with Cabinet to house batteries—formerly \$75, now \$60.

The Crosley 51-P, a tremendous seller at \$25, reduced to \$23.50.

We unhesitatingly state that these sets, together with the other Crosley Radios represent the biggest values ever offered. Crosley Radios range in price from the one tube Model 51 at \$14.50 to the Trirdyn Special at \$60. There is a Crosley to suit every taste and pocket-book.

Before You Buy—Compare Your Choice Will Be a Crosley Most Good Dealers Handle Crosley Radios As is customary prices quoted do not include tubes, loud speaker, phones or batteries.

All Crosley Radios Are Licensed Under Armstrong U. S. Patent 1,113,149.

Prices West of Rockies—Add 10 per cent. The Crosley Radio Corporation POWEL CROSLEY, JR., President 2492 Sassafras St. Cincinnati, O. Crosley Owns and Operates Broadcasting Station WLW

SONG COMPOSERS IN NEW WAR ON RADIO

BACK BILL FOR MORE CONTROL OF WRITINGS

American Society Believed Instigator of Proposed Legislation Aimed to Throttle Broadcasters Anew

WASHINGTON.—Song composers have broken out with a new war on Radio. Up to very recently they were willing to license stations to broadcast their music. Now they would take away that license, even to the extent of cancelling privileges already bought and paid for.

The latest move is a lobby here in support of a new copyright bill, supported and promoted it is said by the American Society of Composers, Authors and Publishers. The new copyright bill, needless to say, is stronger than any protective copyright measure ever considered before, and contains, of course, a clause indicative of the American society's Radio throttling policy.

The bill, introduced in the House of Representatives by Representative Perkins of New Jersey, has been referred to the House patents committee, which likewise has been a reception committee during the past few weeks for a lobby composed of song composers, playwrights, authors and artists galore.

The American society, incidentally, is reported with having notified broadcasters whom they have licensed that broadcasting of certain late popular songs, which they name, must be stopped forthwith because one of their members (Arthur Hammerstein) objects. The society even goes so far as to suggest cancellation of licenses. In explanation this means that a broadcaster has no assurance that he may broadcast the music which the society claims to control, even after he pays for a license.

Amateur Quebec Bands Play for La Presse Trophy

MONTREAL, Can.—Keen competition has been aroused in the province of Quebec for the silver cup offered by La Presse station, CKAC, for the most popular local amateur bands.

Bands from Joliette, St. Hyacinthe, St. John and Drummondville have already gone through the ordeal of broadcasting their musical programs and the mayor of each town has waxed eloquently on the values of their individual cities.

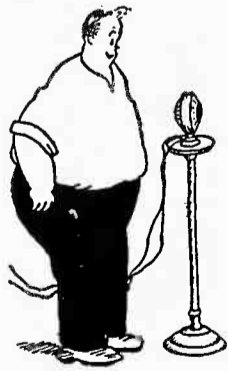
The cities of Three Rivers, Quebec, Sorel, St. Jerome and many others have entered the contest, and especially good band programs are promised listeners who choose to dial on the 425 meter mark each Sunday afternoon between 4:30 and 6:30, eastern time.

Talks on Home Lighting

CHICAGO.—The first of a series of ten lectures on "home lighting" was given recently from Station WQJ by C. E. Johnson, speaking under the auspices of the lighting educational commission.

STARS FOR KIDDIES FROM UNCLE WALT

CHICAGO.—"Uncle Walt," the 5:30 o'clock story teller at WGN, Chicago, has become so engulfed in requests from young listeners for "shooting stars" that he has set aside certain days for children with certain names. On Tuesday, February 10, all little girls named "Mary" who wrote to Uncle Walt and asked for a star received one, and nobody but the Marys got one that evening. The next evening, it was "Johnny's" turn, and all John's who had written to the fat fellow found a star shot into the heavens for them.



"Uncle Walt"

Every night will be dedicated to another name—Thursday, February 12, "Margaret's or Peggy's" night; Friday, February 13, "James' or Jimmy's" night; Tuesday, February 17, "Helen's" party; Wednesday, February 18, "Paul's" show; Thursday, February 19, "Louise's" time, and Friday, February 20, "Tom's or Thomas'" turn.

Each evening at 5:30 Uncle Walt conducts Skeeze time at WGN. "Cuckoo," the impudent bird, is custodian of the children's stars. He tacks the names of the children on the twinkling stars in his star-shooting machine; then there is a "boom" and a sky-rocket whir—and Uncle Walt points the children's attention to the place in the sky where that star is.

HEAR U. S. BUSINESS MEETING PUT ON AIR

WASHINGTON.—Even the United States government can have a business meeting. Radiophans learned this recently when the semi-annual business meeting of the government was broadcast for the first time. The principal feature of the evening was an address of President Coolidge and the report of Gen. H. M. Lord, director of the budget. Ten stations, well scattered about the country, broadcast the entire meeting. The ones carrying the program included WCAP, Washington; WEA, New York city; WOO, Philadelphia; WJAR, Providence, R. I.; WDBH, Worcester, Mass.; WEEL, Boston; WCAE, Pittsburgh; WMAQ, Chicago; WWJ, Detroit, and WOC, Davenport, Iowa. All stations reported good reception of the program.

TRAIN FANS MAKE UP CHURCH COLLECTION

SASKATOON, Sask.—The old joke that Scotchmen prefer Radio church services because of the absence of collection plates will have to be discarded. When the Continental Limited, a Radio-equipped Canadian National railway train, approached here on a recent Sunday morning the passengers heard the services from the Westminster Presbyterian church in this city. They also heard the sermon by Rev. George A. Dixon of Knox church in Calgary, Alta. Both pleased the passengers in the Radio observation so much that a collection was taken and handed to the minister of the Westminster church when the train reached this city. The minister was much surprised by the unexpected contribution.

LEAVES STAGE TO BROADCAST



Maxine Brown, musical comedy leading woman, who is the first to quit the stage for Radio. She is now a paid entertainer at Station WTAS, Elgin, Ill. Miss Brown is well known to thousands of theatergoers, having played in "Odds and Ends," "Floradora" revival, "Moonlight," "The Right Girl" and "Plain Jane."

MAINE WOULD ERECT STATE BROADCASTER

Bill Will Be Introduced Soon in the Legislature

AUGUSTA, Me.—A bill will be introduced soon in the Maine legislature by Senator Benedict F. Maher of Kennebec county seeking the establishment of a state broadcasting station at Augusta.

It is proposed to tell the world about Maine through this medium, giving out news as to the agricultural, tourist and industrial resources of the state. The bill will call for an initial appropriation of \$30,000 for the establishment of the service and \$25,000 a year for the maintenance for the first two years.

The nearness of the proposed station to Europe and that it would be America's most easterly 500-watt broadcasting station is being emphasized.

German broadcasting stations have commenced transmitting conversations and lectures in English to enable their listeners to learn the language. For a long time past French lessons and some Spanish talks have been included in British programs, but the results have not reached expectations.

Hammerstein Would Control Music Used

Producer Takes Rap at American Society's Workings

NEW YORK.—Arthur Hammerstein, producer of "Rose-Marie" and other large musical productions in recent years, has announced that he would stop the publication of sheet music of the tunes of any of his future productions and that he would reserve for himself the rights to the disposition of this music for use by Radio, victrolas and orchestras.

"The composer of shows in whose production I have risked hundreds of thousands of dollars," said Mr. Hammerstein, "by arrangement with the American Society of Composers, Authors and Publishers, permits these melodies which I have popularized to be played everywhere.

"At the end of the year the revenue is divided between this organization and the composer, this despite the fact that I have been directly responsible for creating the demand for the music.

"In the future the composer will have to consent to giving me the sole rights of his work, and if he is a member of the American Society he will have to resign or disregard its rules."

FAMED ANNOUNCERS TO TRAVEL TO WDAF

MEET IN KANSAS CITY FOR RADIO-ELECTRIC SHOW

Hired Hand, Solemn Old Judge, Bill Hay, Lambdin Kay and Gene Rouse Gather

KANSAS CITY, Mo.—Interest of Radiophans all over the country will be centered in Kansas City during the week of March 2, when the Kansas City Electric club will hold its Radio and Electrical show.

For during that week the best-known announcers in the United States will be grouped together for the first time in the history of broadcasting. Announcers who have already accepted the invitation of the Electrical club include the Hired Hand of WBAP; George Hay, the solemn old judge of WLS; Bill Hay, of KFKX; Lambdin Kay, the voice of the south, WSB; Gene Rouse of WOAW; and two Kansas City announcers, John Schilling of WHB and Leo Fitzpatrick, the merry old chief of WDAF. All programs of WHB and WDAF will be broadcast from a special glass-front studio in Convention hall, where the show is to be held, and all the announcers will take part in directing and announcing.

Samuel Furst, who managed the Radio show held in the Hotel Muehlebach in 1923 and also the Electrical show last year, has been elected manager of the show. Leo Fitzpatrick, Radio editor of the Kansas City Star and director of WDAF, will be in charge of entertainment and broadcasting from the hall.

NAA Gets 1,000-Watt Set; Only Waiting New Wave

WASHINGTON.—Fans living within a thousand miles of Washington may soon pick up a "new" and powerful broadcasting station. But the call is an old one in the east; it is "NAA," Arlington, Va., the pioneer naval Radio station and government broadcaster.

A new 1,000-watt set has been installed and the station will start using it just as soon as a suitable wave length can be secured from the department of commerce. The old wave of 435 meters, it is said, would interfere seriously with the two local stations, WRC and WCAP. On account of the increased power, a lower or higher channel is being sought.

Lutheran Church Plans to Broadcast Gospel Services

ST. LOUIS, Mo.—Following the news that the Paulist Fathers would establish a Roman Catholic broadcasting station in New York city, the National Lutheran council announced recently the Lutheran Church in America would shortly broadcast messages through Station KFUS here.

In experimental broadcasting, the council said, it had been heard from Colorado to Massachusetts. Prominent Lutherans will appear on the program from time to time.

ENGLISH IN DRIVE ON OSCILLATING FIENDS

LONDON, England.—Easily the most hated man in the British Radio world is the oscillating fiend who persists in ruining the relaying of every American program in this country. The British Broadcasting company has promised to ruthlessly track him down. The howling and screeching he sets up by trying to pick up the Pittsburgh station direct cannot be cut out by the B. B. C. set and consequently are heard in most parts of Britain, as the American station is re-transmitted from every British station, being relayed from Biggin Hill.

Re-radiators have become such pests that a special department has been set up by the British Broadcasting company to deal with them. This department is using direction-finding apparatus to track down the culprits. According to Captain Eckersley, chief engineer of the B. B. C., a re-radiator can effect reception over a radius of quite five miles from his set. This is because the apparatus used in Britain has not been raised to the high standard of selectivity used in America.

The accompanying cartoon is reproduced from a recent issue of the London Evening News, and illustrates the feeling current here.



The Re-Radiator

CLASS B WAVES SET FOR TIME AT LEAST

COMMERCE DEPARTMENT DESPAIRS AT PROBLEM

Announces Final Allocation of Wave Lengths—\$100,000 Is Allowed for Investigation of Tangle

WASHINGTON, D. C.—Despairing at any possible chance of obtaining more wave channels for contemplated broadcasters, the department of commerce has issued an official list of the new wave lengths for class B stations. This list was effective February 4 and is the result of work of the experts of the department since the third Radio conference last fall.

It will be noted that comparatively few changes have been made, because several schemes which were worked out experimentally, did not prove practicable.

New and Final Class B Assignments

Wave Length Meters	Call Letters	Wave Length Meters	Call Letters
280.2	WNAC	379.5	WGY
282.8	WOAN	379.5	WHAZ
285.5	WREO	384.4	WMBF
285.5	WEMC	389.4	WTAM
285.5	WKAR	389.4	WEAR
288.3	KFKX	394.5	WFI
291.1	Reserved	394.5	WDAR
293.9	WEAO	394.5	WOAI
293.9	WBAV	399.8	WHAS
296.9	KFRU	405.2	WOR
299.8	WPG	405.2	WJY
302.8	WTAS	410.7	Reserved
302.8	WJJD	416.4	WCCO
305.9	WJAR	422.3	WLW
309.1	KDKA	422.3	WMH
312.3	Reserved	428.3	WSB
315.6	WAHG	434.5	NAA
315.6	WGBS	440.9	WDWF
315.6	KFDM	440.9	WOS
319.0	WGR	447.5	WQJ
322.4	KOA	447.5	WMAQ
325.9	WMH	454.3	WJZ
325.9	WSAI	461.3	WCAE
329.5	Reserved	468.5	WCAP
333.1	WBZ	468.5	WRC
336.9	WSAC	475.9	WEEI
336.9	KFMX	475.9	WBAP
336.9	WCAL	475.9	WSUI
340.7	WKAQ	483.6	WHAA
340.7	KSAC	483.6	WOC
344.6	WLS	491.5	WEAF
344.6	WCBD	499.7	WMC
348.6	KOB	508.2	WOO
348.6	WTIC	508.2	WIP
352.7	WWJ	516.9	WCX
352.7	WJAD	526.0	WNYC
356.9	Reserved	526.0	WHO
361.2	WHN	526.0	WOAW
365.6	WHB	535.4	KYW
365.6	WDAF	535.4	WHA
370.2	WEBH	545.1	KSD
370.2	WGN	545.1	KFUO
374.8	KTHS		

\$100,000 for Investigation

An investigation to determine why a receiver within ten miles of a broadcasting station may fail to receive its transmission although in another direction receivers as far as 200 miles away may be obtaining good results, has been approved by the budget bureau. A \$100,000 expenditure for this has been allowed.

Detecting devices will be placed at various points throughout the country. From the results it is hoped to make a better allocation of wave lengths and territories to broadcasters.

The great trouble is caused by the present inadequate legislation giving no power to the secretary of commerce to refuse a license to any applicant who has fulfilled the easy qualifications now necessary. And many class B stations are pending.

ANNOUNCE NEW SUPER STATION FOR CHICAGO

WLS Contemplates the Erection Within Three Months' Time

CHICAGO.—Erection of a new 5,000-watt super-power broadcasting station to replace the 500-watt equipment now in use by WLS, Chicago, was announced here today by Charles M. Kittle, president of Sears, Roebuck and company. The new station is to be built in the open country to avoid interference with other Chicago broadcasters, but the exact location of the antennae has not been decided. The sending towers will probably be erected within fifty miles of Chicago.

Service from the new station will start within three months, according to the present plans of Edgar L. Bill, director of WLS. At the time of inaugurating the new plant it is hoped to have the twin studios now in preparation in the downtown district of Chicago ready for use.

Open House at WEBW

BELOIT, Wis.—Station WEBW recently broadcast the "open house" of the Fairbanks, Morse and company. This is held every year by the employees.

The stars of the evening were "Put" Mossman, Eldora, Iowa, youth, who is the present world's champion horseshoe pitcher, and George May, Akron, Ohio, pitcher, twice holder of the world's barnyard golf championship title.

BEAUTIES ENTERED IN WLW BEAUTY CONTEST



Reading from left to right: Melba Hardert, Mrs. Vera Fischer Weber, Rhoda Bogardus and Lavera M. Bourgeois. Radiophans will vote for them on St. Valentine's night, Saturday, February 14, at 8 p. m., when they are described from Crosley WLW.

Allow \$220,525 for Radio Law
WASHINGTON, D. C.—In reporting out the appropriation bill of the department of commerce for the fiscal year 1926, the appropriations committee of the House of Representatives allowed \$220,525 for administering the Radio law. It is expected that in addition to this a deficiency will be allowed.

Before You Build Your Radio Set



See the New Allen-Bradley Line

Radio amateurs are building better receiving sets, today! They want greater distance, better selectivity and clearer reception.

The new Bradleystat, Bradleyleak, Bradleyohm, Bradleyometer and Bradleyswitch have met with instant favor, everywhere. In a super-class, by themselves, they are the exclusive choice of the discriminating amateur who has learned from experience that noiseless, stepless control is essential for perfect radio reception. Your set will work better with Allen-Bradley Radio Devices. For sale by leading dealers.

Allen-Bradley Co.
Electric Controlling Apparatus

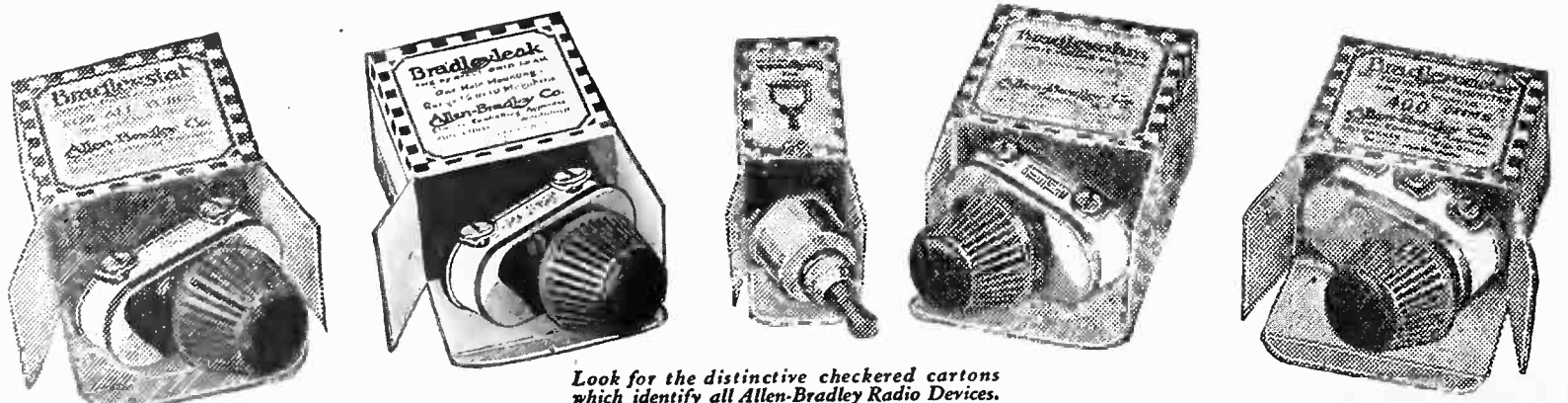
General Office and Factory:

290 Greenfield Avenue

Milwaukee, Wisconsin

Distinctive Features

- 1—Extremely compact without loss of control.
- 2—One-hole mounting for panels. Table mounting if desired.
- 3—Noiseless, stepless control, due to graphite discs.
- 4—Guaranteed against defects in material and workmanship.
- 5—Sold in distinctive checkered cartons by leading radio dealers.

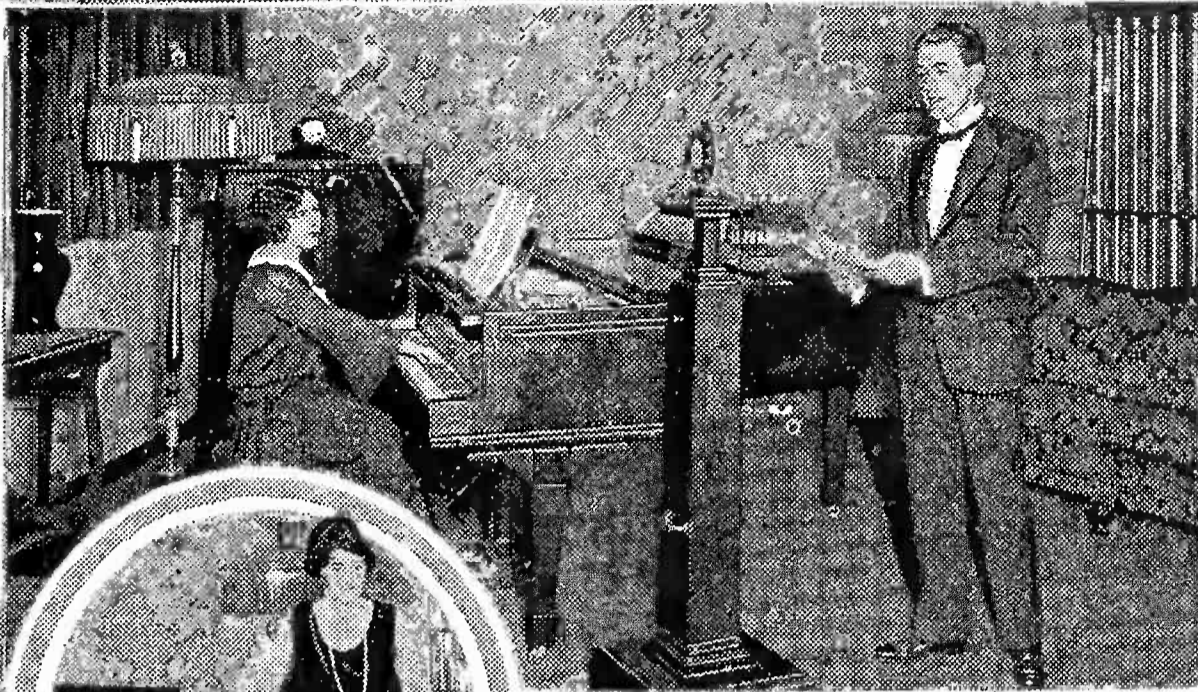


Look for the distinctive checkered cartons which identify all Allen-Bradley Radio Devices.

WFI—In The City of Brotherly Love



Ednyfed Lewis, station director at WFI.



Above, view of the studio, showing Harold Simonds at the microphone. Miss Caroline Hoffman, one of the station's accompanists, at the piano. Left, Mabel Swint Ewer, program director.



John Vandersloot, bass soloist and announcer "J. V."

IF YOU'RE a DX hound you've no doubt heard Station WFI, one of the most powerful stations in the United States. It is not an idle boast to say WFI is powerful, for, be it known, it is the only station in Philadelphia that was heard on the other side during the recent trans-Atlantic tests. And that's going some, for the city of brotherly love boasts of five broadcasters transmitting on 500 watts.

WFI, operated by Strawbridge and Clothier, a large department store, boasts of the honor of being the first station in Philadelphia to broadcast. It just nosed out another "Philly" station by about fifteen minutes for the coveted honor. The governor of Pennsylvania and the mayor of Philadelphia both participated in the opening exercises, and then proceeded to another station just across the street, there to also officially open that station.

When WFI "went on the air" it was only a 15-watt station. Then it got a little more power, and now, since the station has been rebuilt at a large expense, it transmits on 500 watts. The wave length is 35 meters.

To give the people what is best in everything is a hard road to travel, and one on which the owners and the personnel of any broadcasting station will find little help. But, and WFI proves it, if a station will stick to its rule and allow no deviations, it will finally win a host of admirers, and admirers are listeners in, and that's what every station wants.

WFI is the Philadelphia station which broadcasts the Eveready hour and the Goodrich Silvertown Cord orchestra, and its latest achievement is to be among those broadcasting the Victor concerts, which have created a furore in theatrical circles. Many other features have been offered WFI, but it turned them down flat and simply because it did not think it was the kind of entertainment its clientele of listeners in wanted.

The personnel is composed of people musically inclined. The director, Ednyfed Lewis, is one of the best known Welsh tenors in the eastern section of the country. He comes of a musical family. His father was an opera star, and his brothers are part of a well-known Welsh quartet. Mr. Lewis last year won the \$1,000 prize in Philadelphia as director of the Welsh chorus, which competed against a number of other well-known musical organizations.

John Vandersloot bears the reputation of being one of the best announcers in the country. He is known as "J. V.," and is also an excellent bass soloist. Mabel Swint Ewer, program director and hostess to those who entertain from the studio, is an accomplished musician. She also comes from a musical family of Boston, and to keep up the

name, Mrs. Ewer is having all the little Ewers study music. Although her children are well up in music, none have ever been heard over the Radio, for living up to the traditions of the station, Mrs. Ewer says they will not be heard until she thinks they are up to the mark for the best Radio broadcasting. Harold A. Simonds, who announces as "H. S.," is the possessor of a pleasing baritone voice, particularly adapted to Radio broadcasting. Aleta Smith, an assistant, is a soprano with a sweet mellow voice, who hopes to be heard in the higher circles of music some day.

One of the best known entertainers from WFI is Jean Hight, better known as "Sunny Jim, the kiddies' pal." Mr. Hight, who is still quite young, made "a hit over night." Previous to his coming to WFI, the station always had women bedtime story tellers. Sunny Jim came, spread a lot of sunshine among thousands of kiddies all over the country, and became so popular that one of the song hits last year, "Sunny Jim," which was played and sung at virtually every station throughout the country, was composed in his honor by a nationally known song writer.

There is one person connected with the station who is virtually unheard of over the air and he is, nevertheless, the guiding light in all things musical. It may be said that he is responsible for nearly all of the big musical events heard from this station. He is Mr. Herbert J. Tily, general manager of the store, and a doctor of music. Mr. Tily is one of those unusual combinations of successful

business man and musician, and neither vocation suffers because of the other. He is a conductor, an organist, composer and a connoisseur of art, and was a regular entertainer some time ago over the Radio.

Now, Radiophans know why WFI broadcasts such wonderful music. It is said that song pluggers on passing WFI hang a piece of crepe on their hats and go their way. They know there is no open door for them.

One of the outstanding broadcasts that this station has put across, was when they broadcast the Carnivora Opera company. The members of the company, be it known, hail from Africa, Asia and points west. Their initial appearance was broadcast from their present headquarters at the Zoological Gardens in Philadelphia.

Leo Africanus, a gentleman of color, with a deep bass voice, proceeded to imitate static during its worst period when he opened his mouth. At last reports, the operators of the station were well on the way to having the microphone adjusted to its normal sensitiveness.

Novel features WFI has just added are the Gold Dust Twins and the Atwater Kent Radio artists. Many novel and unique features are scheduled for this station in the future. That is one of the WFI staff's best pastimes—planning new and original features for Philadelphia and outside listeners—and they thrive on the pastime.

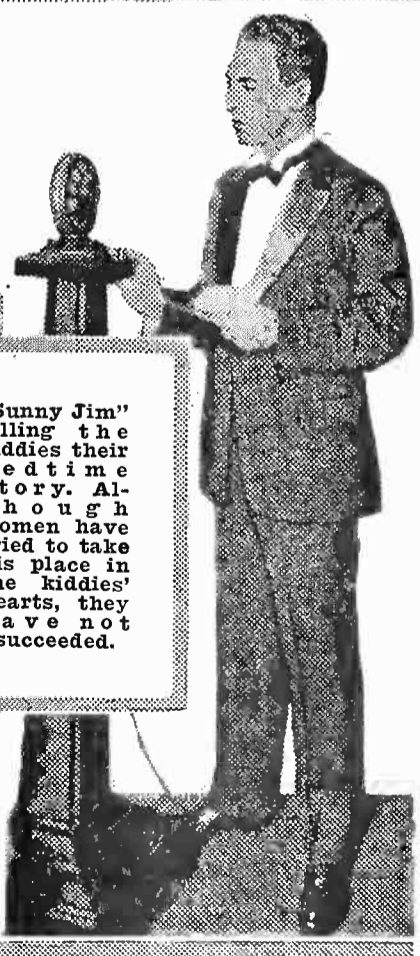


Jean Hight, better known as "Sunny Jim, the kiddies' pal."



Main operating room. Howard W. Miller, chief operator, at the control table, while George Humpfer, Radio engineer, is seen at the power panel.

"Sunny Jim" telling the kiddies their bedtime story. Although women have tried to take his place in the kiddies' hearts, they have not succeeded.



LICENSES FAIL WITH LISTENERS AVOIDING

ENGLISH ARE PUZZLED BY NON-PAYING LISTENERS

Believe Three Times as Many Set Owners Exist as Pay—Problem Irritates Officials

LONDON, England.—How many "pirate" listeners are there in Great Britain? That is the question that is puzzling the British Broadcasting company, which relies for its entire revenue upon a percentage of the license fees. Radio "pirates" abound in their thousands. The estimates of people who are supposed to know, place the number of persons using receiving sets without a license at no less than 2,000,000, or twice the number of persons with licensed sets. While this may perhaps be going too far it is undoubtedly a fact that there are many towns in England where for every licensed listener there are two unlicensed. Only a few days ago a station director found out of 1,200 letters on a certain broadcast topic only about sixty were signed, indicating that they had come from license holders.

Conscientious Objectors Object

It is felt that the enactment of new legislation covering this contingency is needed. Many fans are refusing on principle to pay the license fee, declaring that strictly in the law broadcast licenses are illegal under the particular act of parliament by which they were brought into being. But it is unfair that one section of the Radio public should be paying for the entertainment of another section that refuses to admit its liability to pay. One fan, however, points out that he would willingly take out a license if he listened to British programs, but states that as he only listens to Continental programs, he owes the B. B. C. nothing.

(Note.—At present the annual license fee which all British fans must pay is \$2.50, one-fourth of which is retained by the post office.)

French Lessons Swell Class

CINCINNATI, Ohio. — Madame Ida Teimpidis, teacher of French at Crosley WLW, has a number of interesting letters from her pupils in all parts of the land who have been following her lessons.

LAST TUBE PATENT EXPIRES NEXT WEEK

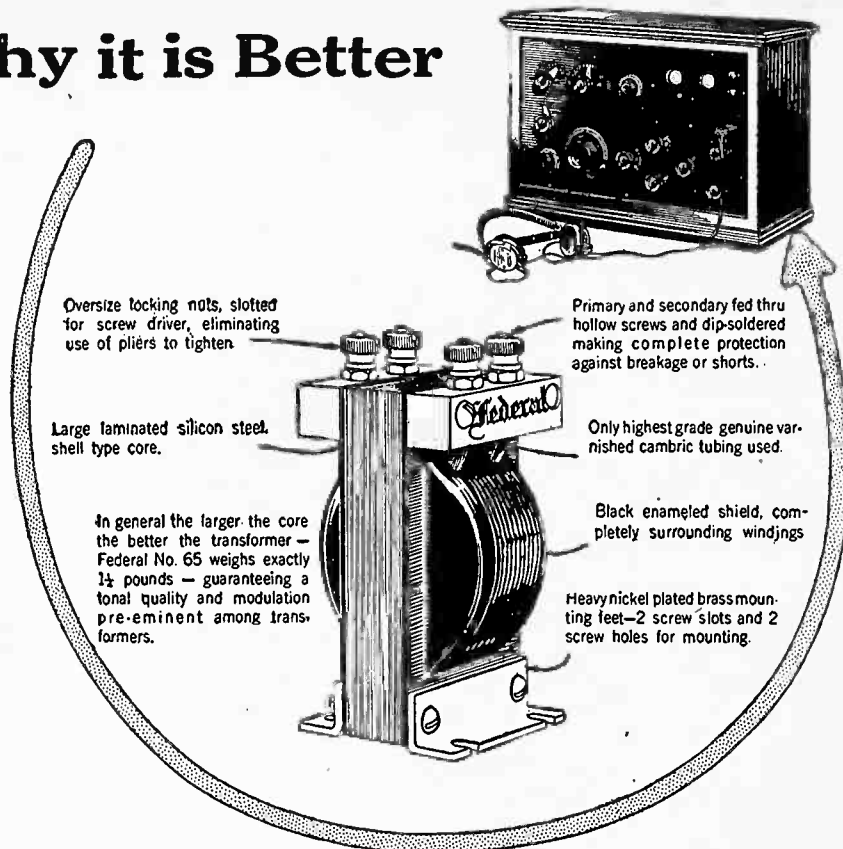


THE second and last basic patent on the three electrode vacuum tube expires Wednesday, February 18. What will happen to tubes as a result of competition will be the source of much delight to Radiophans, it is believed. In this connection what is believed to be the first Radio tube is shown in the above picture. It is being held by C. W. Mitman, curator of engineering at the U. S. National museum at Washington, and was made in 1898 by D. McFarlan Moore of New York city. Radio impulses from this tube ignited a bomb a city block away and blew up a miniature of the battleship Maine.

New Broadcasting Chamber for Station WHA Musicians

MADISON, Wis.—A new broadcasting chamber in the music hall has been fitted up for broadcasting musical programs from Station WHA, University of Wisconsin, in addition to the regular broadcasting room in Sterling hall. The choral union and the university orchestra are now using the new music hall room, and regular programs are being also sent out at the station headquarters.

Why it is Better



Oversize locking nuts, slotted for screw driver, eliminating use of pliers to tighten.

Large laminated silicon steel shell type core.

In general the larger the core the better the transformer—Federal No. 65 weighs exactly 1 1/2 pounds—guaranteeing a tonal quality and modulation pre-eminent among transformers.

Primary and secondary fed thru hollow screws and dip-soldered making complete protection against breakage or shorts.

Only highest grade genuine varnished cambric tubing used.

Black enameled shield, completely surrounding windings.

Heavy nickel plated brass mounting feet—2 screw slots and 2 screw holes for mounting.

"MASTER of Every Note in the Orchestral Range" is the proven claim of the Federal No. 65 Audio Frequency Transformer! Volume without distortion is the basis for the beauty of Federal Tone.

same engineering skill that has made Federal the recognized leader in electrical communication apparatus since 1890.

From its oversize locking nuts to its heavy brass mounting feet the Federal No. 65 Transformer incorporates the

Insist upon Federal parts for your "pet" hook-up. There are over 130 standard parts bearing the Federal iron-clad performance guarantee.

FEDERAL TELEPHONE MANUFACTURING CORP.
Buffalo, N. Y.

- Boston
- New York
- Philadelphia
- Pittsburgh



Federal

Standard RADIO Products

- Chicago
- San Francisco
- Bridgeburg
- Canada



The Silvertown Cord Orchestra (above) under the direction of Joseph Knecht, has been delighting millions of lovers of good dance music in programs broadcast every Tuesday night from 10 to 11 from WEA, N.Y.; WJAR, Providence; WFI, Philadelphia; WCAE, Pittsburgh; WGR, Buffalo; WEEL, Boston.

Goodrich Hard Rubber Radio Panels • Goodrich V. T. Sockets • Goodrich Variometers Unwound. Radiophone Ear Cushions • Spaghetti Tubing Battery Mats.

Better Reception

Science has established a big fact in radio—dielectric losses reduce range and selectivity.

in those distant stations finer—get better reception and enjoy to a greater degree the big dance orchestras, soloists, orators, and other features.

Hard Rubber has the lowest dielectric losses of any practical panel material yet employed. Goodrich Hard Rubber Panels are distinctly superior in permanence of color and lustre, and freedom from warpage. Use them in your set and bring

For maximum selectivity and widest possible range use Goodrich Rubber Radio Products. Fifty-five years' experience is behind them—they represent highest rubber quality.

THE B. F. GOODRICH RUBBER COMPANY
ESTABLISHED 1870
Akron, Ohio

Goodrich RUBBER RADIO PRODUCTS

"Best in the Long Run"

STATION CHIC OPENS WITH FINE PROGRAM

NORTHERN ELECTRIC NOW OWNS TWO STATIONS

Famous Artists to Broadcast Through Courtesy of Canadian National Carbon Company in Future

TORONTO, Can.—Station CHIC is now on the air. This station, owned and controlled by the Northern Electric Company, Ltd., is the second station owned by this company to broadcast in Canada. The other station is located at Montreal, using the call letters CHYC.

The opening program was broadcast on 350 meters from 7:30 to 8:30 p. m., consisting of numbers of a classical nature. From 9:30 to 11 p. m. was a popular dance program.

Radiophans in the eastern part of the country are going to hear more programs by famous artists, who are recognized masters in their particular arts. This will be through the courtesy of the Canadian National Carbon company.

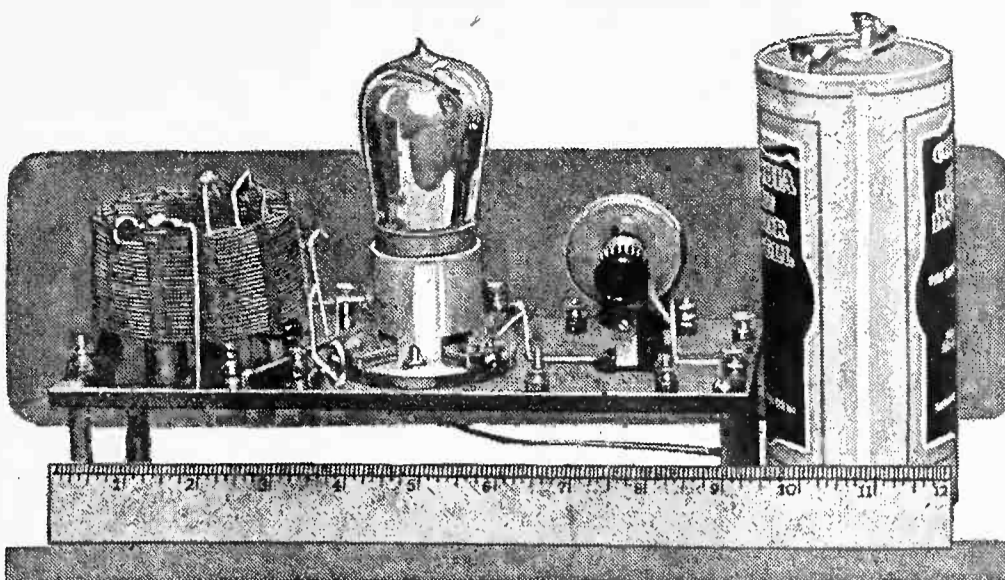
Use Best Talent Procurable

Senor Alberto Guerrero, who is recognized among authorities as one of the greatest pianists in North America; Mr. Ferdinand Fillion, who is perhaps Canada's finest exponent of the violin, and Mr. Arthur Blight, who is not only Canada's premier baritone, but is rated as one of the authorities on voice in this continent, are slated for two recitals to be given in the near future.

All three of these artists are members of the faculty of the Toronto Conservatory of Music of the University of Toronto, and have been heard in connection with Eveready entertainments throughout the eastern part of the United States on previous occasions. This will be the first time that all three of these artists have appeared on the same program.

The hornless loud speaker made out of papier mache is rapidly gaining favor in England. Greater care, however, is necessary in adjusting this type of producer to avoid a tendency to "drumminess."

SMALL BROADCAST TRANSMITTER



The small sending set shown above with foot rule and dry cell for size comparison is capable of broadcasting a distance of several miles. Listeners in, however, should not attempt to build sending sets without first obtaining a government license. This requires an expert knowledge of Radio. Radiophans might remember this picture as an object lesson, for receiving sets this size and larger often transmit disagreeable noises for miles around when improperly handled.

Experiments in voice amplification are being carried out at Westminster Abbey. Microphones have been placed over the pulpit and the reading desk. It has not yet been decided whether the installation is to be permanent.

WAHG IN NEW FEAT; REBROADCASTS KGO

IS FIRST TIME EAST HAS RELAYED WEST COAST

Presents Program of Harry Halstead Orchestra Playing in San Francisco —Will Repeat Stunt

RICHMOND HILL, N. Y.—Thousands of eastern Radiophans experienced a brand new thrill on a recent morning when from 2:25 to 4 a. m., eastern time, WAHG, A. H. Grebe station here, rebroadcast the program of KGO, General Electric station at Oakland, Calif.

This is the first time in the history of Radio that a west coast program has been rebroadcast by an east coast station.

The program at KGO, picked up and released for its second flight over the ether, was by the Harry Halstead orchestra at the St. Francis hotel, San Francisco. The rebroadcasting at Richmond Hill was done through the experimental station which uses the call letters 2XE. A wave length of 516 meters was employed instead of the usual 316-meter wave length of WAHG.

More rebroadcasts of KGO are promised for eastern fans by WAHG. The first very successful effort was rewarded by a great response from eastern listeners. Telephone messages and telegrams flooded into the offices of the Grebe station.

Train at Home For Big Money in RADIO!

Thousands earning \$50 to \$200 a week in easy, interesting work You can do it!



Earns College Education
I entered the maritime service of the Radio Corporation of America and served several months on board ship. I not only had the advantages of visiting foreign countries at no cost to me but I was also able to save enough money to pay for my tuition to college.
G. E. Rogers,
Troy, N. Y.



\$405 in One Month
I cleaned up \$405 in one month recently. Not so bad—is it—for a fellow who just completed your course a short time ago.
Emmet Welch,
Peculiar, Mo.

Radio just teems with money making opportunities. Every Radio set which is sold means profit in somebody's pocket. Every broadcasting station erected means big pay for Radio Engineers, Radio Mechanics, Operators, etc. Thousands are "cleaning up," fortunes are being made almost overnight in this fascinating business. Big salaries, interesting, easy work, short hours, and a wonderful future are offered to ambitious men who get into Radio now!

One of our recent graduates is making over \$400 a month in his own business. Another has increased his pay \$1,300 a year. Still another writes, "I made \$3,500 in one year working for myself."

Easy to Learn Radio at Home in Spare Time

Right now Radio is the fastest growing industry in the world. Thousands of Certified Radio-tricians are wanted to design Radio sets; to make new Radio improvements; to manufacture Radio equipment and install it; to maintain and operate great broadcasting stations and home Radio sets; to repair and sell Radio apparatus; to operate aboard ships and at land stations. Employers write and telegraph us continually, seeking to employ our graduates at splendid salaries.

You, too, can easily and quickly qualify in your spare time at home through the help of the National Radio Institute—America's first and biggest correspondence Radio school. No matter how little you know about electricity or Radio, we will guarantee to prepare you thoroughly for one of the big jobs in a few months. One of our recent graduates, Bert Roodzant, writes, "I now have a license and a good job, although I did not know the difference between a volt and an ampere before enrolling."

You Learn by Doing

All materials required for practical instruction are furnished you free of charge. This is an absolutely complete course now being offered which prepares you for a Government First Class Commercial License and the really "big-pay" jobs in Radio.

Send for Free Book and Special Offer

No other field today offers such great opportunities as Radio. Take your choice of the wonderful openings everywhere. Prepare now to step into the most fascinating and best paid profession today. Read about the opportunities open now—the different kinds of work—the salaries paid. Write today for 32-page book, "Rich Rewards in Radio," that tells how prominent Radio experts can teach you to become a Certified Radio-trician in your spare time.

Important—those who act immediately will also receive the details of our Special Reduced Rate. Mail the coupon or write a letter Now.—National Radio Institute, Dept. 55DB, Washington, D. C.



Triples Salary
I am earning three times as much as before enrolling.
Arthur Herke,
Vancouver, B. C.



From \$15 to \$80 a Week
Before I enrolled I was making \$15 a week. Now, I earn from \$2,080 to \$4,420 a year. I believe the course will be worth at least \$100,000 to me.
George A. Adams,
Tamaqua, Pa.



Earns \$50 to \$83 a Week
I enjoyed every one of your lessons and had no trouble whatever. I earn \$50 to \$83 a week beside a commission on sales.
Michael De Marco,
Boston, Mass.



Doubles Salary
I can very easily make double the amount of money now than before I enrolled with you.
T. Winder,
Grand Junction, Colo.



Pay Increases Over \$100 a Month
I am averaging anywhere from \$75 to \$150 a month more than I was making before enrolling with you. I would not consider \$10,000 too much for the course.
A. N. Long,
Greensburg, Pa.

ZENITH
KENNEDY
Radiodyne
THERMODYNE
ULTRADYNE
MURDOCK
QZARKA
Pfanstiehl
MICHIGAN
Deresnadyne
MALONE LEMON
MASTER RADIO
ROYAL
Howard
Pathe
HARMONY
AUDIOLA
GLOBE
SAAL AND MANY OTHERS

More set makers use
THORDARSON
Super
TRANSFORMERS

Can you imagine nationally famous builders of sets costing up to \$400 each, jeopardizing the tone quality of their instruments with anything short of the best amplification? Of course not! That is why Thordarson's are standard on more quality sets than are all competitive transformers combined. Follow the lead of the leaders—build or replace with Thordarson's. *Unconditionally guaranteed.* Audio frequency: 2-1, \$5. 3½-1, \$4. 6-1, \$4.50. Power Amplifying, pair \$13. All good dealers. Made in Chicago by Thordarson Electric Manufacturing Co.

NATIONAL RADIO INSTITUTE, Dept. 55DB, Washington, D. C.

Without obligation send me your book, "Rich Rewards in Radio," which tells all about the opportunities in Radio, how spare time study at home will qualify me quickly as a Certified Radio-trician so I can get one of these splendid positions, and how your Employment Service helps me to secure a big pay job.

Name..... Age.....
Street.....
City..... State.....

AN EVENING AT HOME WITH THE LISTENER IN (SEE INSTRUCTIONS FOR USE BELOW)

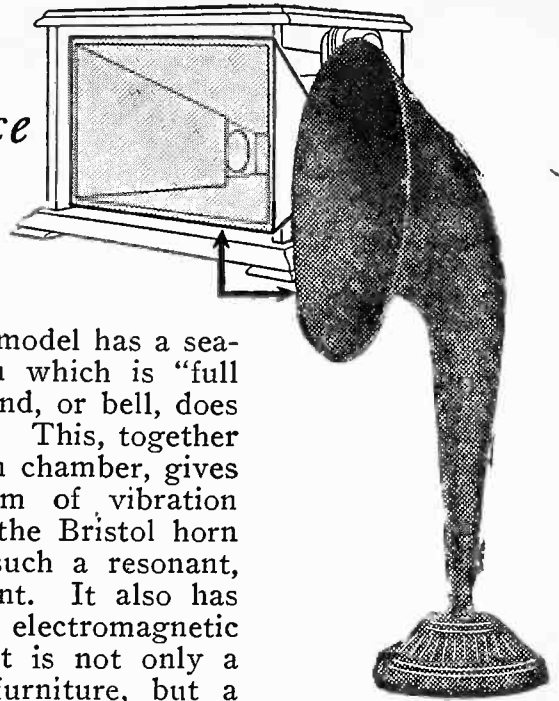
Table with columns for Station and City, Met., Saturday, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday. Lists various radio stations and their broadcast times.

Instructions for Use.—All the hours above are given in Central Standard Time. If your city uses Eastern Time, add one hour to each of the periods stated; if your city uses Mountain Time, subtract one hour; if your city uses Pacific Time, subtract two hours. This table includes only the evening Radiocasts, and, on Sunday, the late afternoon program.

STATIONS IN ORDER OF WAVE LENGTHS USED

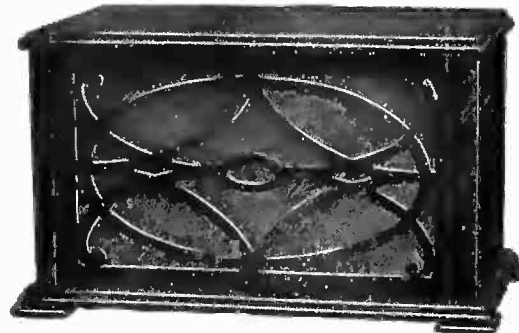
Table with columns for Meters Call, listing stations in order of wave lengths used.

It Has the Full Sweet Resonance of Our Upright Horn



Model S, \$25.00

THE new cabinet model has a seasoned wood horn which is "full floating"—the outer end, or bell, does not touch the cabinet. This, together with a long expansion chamber, gives it that same freedom of vibration which goes to make the Bristol horn type Loud Speaker such a resonant, sweet-toned instrument. It also has the same high-grade electromagnetic sound mechanism. It is not only a handsome piece of furniture, but a speaker worthy of the best radio set that money can buy.



Cabinet Model, \$30.00

There are five Bristol Loud Speakers, priced from \$12.50 to \$30.00. If not at your dealer's, write for Bulletin No. AY-3020.

THE BRISTOL COMPANY Waterbury, Conn.

BRISTOL AUDIOPHONE Loud Speaker

For 36 Years Makers of BRISTOL'S RECORDING INSTRUMENTS. Ask Any Technical Engineer

Send for it!

Before you build your set



EVERY RADIO FAN should have a copy of the "Shamrock Radio Builder's Guide Book." It contains carefully planned diagrams and complete instructions for building ten different circuits—at prices ranging from \$15.00 to \$50.00. Page 21 of this popular booklet describes a powerful little receiver—

THE SHAMROCK-HARKNESS Two-Tube Reflex

Operates a loud speaker—Two tubes do the work of five—Cuts battery cost 60%—Does not squeal, howl or radiate—Stations can be logged with utmost accuracy—Amazing clarity and volume!

Also ask to see the improved SHAMROCK-HARKNESS THREE-TUBE COUNTERFLEX The Wonder Set \$39.50

Insist on the genuine Shamrock Kit containing only genuine licensed Shamrock-Harkness parts. They are specially balanced, and are backed by our unconditional guarantee. \$35

Form for ordering the Shamrock Radio Builder's Guide Book, including fields for Name and Address.

SHAMROCK FOR SELECTIVE TUNING

9,
 WDAF;
 5, WGY;
 0, WOC;
 WEAJ;
 1, KYW,
 WBCN;
 Q; 9:15,
 WCCO,
 WDFW,
 F; 7:15,
 C; 7:30,
 2, WOS;
), KGW.

arks; June Lee,
 Hill, Hirsch,
 Hughes, soprano;
 9), 6:45 p. m.,
 ee Rouse trio;
 Pan American
 Director: United
 quintet; Fred
 awler, soprano;
 Ralon, violinist;
 t; 10:45, Club
 1), 8:15-9:45 p.
 Raymond Lyon
 baritone.
 9), 10 p. m.,
 les W. Parting-
 clarinetist; Eu-
 moeller, pianist;
 n, pianist; Earl
 -6 p. m., Vick
 Bonnie Barn-
 rus; 10:45, Dr.
 , 6 p. m., Guy
 3:15-6:30 p. m.,
 ay Luebr, bari-
 osher Parmenter.
 3 p. m., Detroit
 Detroit News or-
 chestra's Victor Re-
 orchestra.

20

CHNC, KFKU,
 WBBR, WBZ,
 WHAZ, WIP,
 WOI, WORD,
 :30 p. m., uni-
 , 7:30 p. m.,
 usical program,
 C. H. Wright,
 c. Joe Mazzieio
). 7:30 p. m.,
 1 solos, pupils,
 Rita Swain, so-
 6:30-8 p. m.,
 cd hotel concert
 : Jessie Archer,
 dress; 10:30-12
 ard hotel dance
 .1), 6:15 p. m.,
 7:30, children's
 tsburgh studio;
 , 8 p. m., Re-
 , 5:30-6 p. m.,
 Aeolian resi-
 rland, organist;
 ld's Syncopating
 one; Juanita Russ,
 at program, pupils of
 Jay Plowe flute ensemble

February
 8:30,
 9:03,
 10,
 Woco,
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 19:
 Woc,
 9:30,
 10,
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 11,
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 20:
 Wnye;
 Cnrt,
 Wben,
 0:30,
 1:45,
 Khj;
 Kgw;
 KFI, Los Angeles, Calif. (Pacific, 467), 5:30-6 p. m.,
 Examiner's musical half hour; 6:45-7, Y. M. C. A.
 speaker; 7-8, dance orchestra; 8-9, Standard Oil com-
 pany of California, presenting a musical comedy; 9-10,
 Examiner, program, League of American Penwomen;
 10-11, all vocal recital.
 KFKU, Lawrence, Kan. (Central, 275), 6:50 p. m., piano
 tuning-in numbers; 7, music; 7:15, "Planting for
 Winter Beauty," Prof. W. C. Stevens; 7:30, basketball
 game, K. U. vs. Drake U.; 8:30, "From Coal Tar to
 Dyes," Dr. Raymond Q. Brewster; 8:45, educational
 psychology, lesson VII, Dean R. A. Schwieger.
 KFNF, Shenandoah, Iowa (Central, 266), 6:30 p. m.,
 concert, Verden, Ben H. Schober, director.
 KGO, Oakland, Calif. (Pacific, 300), 8 p. m., program,
 San Francisco Chamber of commerce; address, Paul
 Shoup; Olga Petrova, stage and screen actress; address,
 Robert Newton Lynch; Charles F. Bulott, tenor; Austin
 Sperry, baritone; Uda Waldrop, pianist; music, Calli-
 fornia, Granada, Imperial, Loew's Warfield theaters;
 10-11 a. m., Henry Halstead's orchestra.
 KFSG, Los Angeles, Calif. (Pacific, 278), 7:30-9:15
 p. m., auditorium service and sermon, Aimee Semple
 McPherson, pastor; 9:15-10, studio program, Silver
 band, G. N. Nichols, director; 10-11, organ recital,
 Esther Fricke Green.
 KHJ, Los Angeles, Calif. (Pacific, 404), 12:30-1:30
 p. m., program, Loew's State theater; 2:30-3:30, pro-
 gram, Pacific States Electric company, Check Seal
 trio; 6-6:30, Art Hickman's Biltmore hotel concert
 orchestra, Edward Fitzpatrick, director; 6:30-7:30,
 stories American history, Prof. Walter Sylvester Hert-
 zog; bedtime story by Uncle John; 8-9, program,
 Morris, the tailor; 9-10, Piggly Wiggly girls' trio;
 10-11, Earl Burtnett's Biltmore hotel dance orchestra.
 KJS, Los Angeles, Calif. (Pacific, 293), 8-9:30 p. m.,
 instrumental program of chamber music.
 KNX, Hollywood, Calif. (Pacific, 337), 5:45-6:15 p. m.,

WCX, Detroit, Mich. (Eastern, 516.9), 4:15 p. m.,
 musical program; 6, dinner concert, Book-Cadillac
 hotel; 8:30, musical program.
 WDAF, Kansas City, Mo. (Central, 365.6), 6-7 p. m.,
 piano tuning-in number on the Duo-Art; readings,
 Cecile Burton; address, series of book talks, Louis
 Mecker; bedtime story; music, Trilanon ensemble; 11:45-
 1 a. m., Merry Old Chief, Plantation players.
 WDFW, Providence, R. I. (Eastern, 440.9), 8 p. m.,
 educational talks, Brown university.
 WEAJ, New York, N. Y. (Eastern, 491.5), 4-4:20 p.
 m., "These Eventful Years," Franklin H. Hooper;
 4:20-4:35, Helen Muller, mezzo soprano; 6-7, dinner
 music, Waldorf-Astoria hotel; 7-7:30, services, Feder-
 ation of Greater New York churches; 7:30-7:45, Art
 talk; 7:45-8, Moeller trio; 8-8:20, Columbia university
 lecture course; 8:30-9, talk, Packard Motor Car com-
 pany; 9-10, Atwater Kent Radio artists from Stations
 WEAJ, WEEL, WJAR, WGR, WFI, and WCAE;
 10-10:15, Miriam Klyne, soprano; 10:15-10:30, Leon
 Kovick, baritone; 10:30-10:45, Harry Jentes, pianist;
 11-12, Vincent Lopez and his Hotel Pennsylvania
 orchestra.
 WEAR, Cleveland, Ohio (Eastern, 390), 7 p. m., Austin
 J. Wylie's Golden Pheasant-Vocalion recording orches-
 tra; 8, studio program, orchestral numbers.
 WEBH, Chicago, Ill. (Central, 370.2), 7 p. m., Oriole
 orchestra; Margaret Fitzgerald, contralto; musical bits,
 Riviera theater; 9, Belle Forbes Cutter, soprano; John
 Stamford, tenor; Oriole orchestra; 11, Loos Brothers;
 Oriole orchestra; Banks Kennedy, pianist; Nick Lucas.
 WEEL, Boston, Mass. (Eastern, 475.9), 6:30 p. m., big
 brother club; 7:15, Alpha ladies' trio; Mrs. Jessie
 Whitworth, soprano; 7:55, Pathe News flashes; 8, New
 York program.
 WFAA, Dallas, Texas (Central, 475.9), 6:30-7:30 p. m.,
 vesper recital, Jack A. Davls and his orchestra; 8:30-
 9:30, A. & M. Collego of Texas; 11-12, Frank Daven-
 port and his orchestra.

8:35, to be announced; 8:50, University of Chicago
 lecture; 9:15, program, Mrs. Louise H. Crum, soprano.
 WMC, Memphis, Tenn. (Central, 499.7), 8:30 p. m., mu-
 sical program, Bower's Stores corporation.
 WNYC, New York, N. Y. (Eastern, 526), 7:35-7:45 p.
 m., sports talk, Thornton Fisher; 8:30-9:30, program
 of music.
 WOAW, Omaha, Nebr. (Central, 526), 6 p. m., every
 child's story hour, Grace Sorenson; 6:20, music; 6:45,
 Randall's Royal Fontenelle orchestra; 9, program, aus-
 pices Hannan-Van Brunt company, Ford and Lincoln
 dealers; 10:30, Frank W. Hodek, Jr., and his Omaha
 nightingales.
 WOAI, San Antonio, Texas (Central, 394.5), 9:30 p. m.,
 Jimmie Joy's Hotel St. Anthony orchestra.
 WOC, Davenport, Ia. (Central, 483.6), 7 p. m., sand-
 man's visit, Val McLaughlin; 7:20, educational lecture;
 G. Schuster Sisters' California orchestra; 11, Lonis
 Connor and his LeClaire hotel orchestra; Jack Little
 and Paul Small, entertainers.
 WOI, Ames Iowa (Central, 270), 8:15 p. m., music.
 WOO, Philadelphia, Pa. (Eastern, 509.9), 4:45 p. m.,
 organ recital, Mary E. Vogt.
 WORD, Batavia, Ill. (Central, 275), 7 p. m., I. B. S.
 A. choral singers; 7:15, Florence Smith, pianist; 7:25,
 John T. Read, bass; 7:35, I. B. S. A. choral singers;
 7:50, lecture, Judge J. F. Rutherford; 8:30, Marvyl L.
 Larson, soprano; 8:40, I. B. S. A. trio; 8:50, I. B. S.
 A. choral singers.
 WQJ, Chicago, Ill. (Central, 448), 11-12 m., "Cheese
 for Lenten Meals," Erna Bertrams; "The New Styles
 for Spring," Mrs. Eleanor Chalmers; "Ice Cream
 Gossip," L. L. Jones; 3-4 p. m., "How They Cook
 It in Dixie," Josephine Naylor; "Light and Life,"
 William Feulks; 7-8, dinner concert, Ralph Williams
 and his Rainbo Gardon orchestra; Mrs. Lyda Lochner,
 contralto; Edith Buckmaster, accompanist; 10-2 a. m.,

KFNF, Shenandoah, Iowa (Central, 266), 6:30 p. m.,
 concert.
 KFOA, Seattle, Wcsh. (Pacific, 455), 6:45-8:15 p. m.,
 Sherman Clay and company; 8:30-10, Times studio pro-
 gram, Nelle Duffy, Faith Rossiter; 10:05-11, Olympic
 hotel dance music.
 KFQX, Seattle, Wash. (Pacific, 238), 7:15 p. m., bed-
 time story, Aunt Vivlen; 8-9, Earl Gray and his
 Hotel Butler orchestra; 9-10, concert hour; 10-11,
 Earl Gray and his orchestra.
 KFSG, Los Angeles, Calif. (Pacific, 278), 7:30-9:15
 p. m., young people's night at Angelus temple, sermon,
 Aimee Semple McPherson, pastor; 9:15-10, concert,
 Silver band, G. N. Nichols, director; talk on Radio,
 N. E. Brown; 10-11, organ recital, Roy Reid Brignall.
 KGW, Portland, Ore. (Pacific, 492), 8 p. m., lecture,
 University of Oregon Extension division; 10:30, Hoot
 Owls.
 KHJ, Los Angeles, Calif. (Pacific, 404), 12:30-1:30
 p. m., Perry's orchestra; 2:30-3:30, matinee musicale,
 Pacific States Electric company; 6-6:30, Art Hickman's
 Biltmore hotel concert orchestra, Edward Fitzpatrick,
 director; 6:30-7:30, little stories American history,
 Prof. Walter Sylvester Hertzog; Richard Heudrick,
 screen starlet and Uncle John; 8-10, a trip through
 Orange County, California, presented by Orange County
 Farm bureau; 10-11, Earl Burtnett's Biltmore hotel
 dance orchestra.
 KNX, Hollywood, Calif. (Pacific, 337), 5:45-6:15 p. m.,
 Wuriltzer organ recital; sports talk, Sid Ziff; 6:30-
 7:30, dinner hour music; 8-9, program, Columbia Out-
 fitting company; 9-10, program, Eastern Outfitting com-
 pany; 10-11, amateur hour; 11-12, Abe Lyman's Cocco-
 nut Grove orchestra from Ambassador hotel.
 KOA, Denver, Colo. (Mountain, 322.4), 6:40 p. m.,
 Book of Knowledge; 8, studio program, oratorio "St.
 (Continued on page 14)

Construction of the Six Tube Hetduogen

More Details About the Circuit

By C. E. Brush

FROM the letters which have come in it is clear that the writer was not explicit enough in describing the connections to be made to the oscillator coil. The symptoms described by the many readers in connection with unsatisfactory operation indicate that the oscillator has not been wired correctly to the rest of the set. In part two which was published in the January 3rd issue the writer was very careful to tell readers how to bring out the wires from the oscillator coil so that they would be in a convenient position when mounted as shown in figure 10 in the January 17th issue. When the oscillator coil is secured to the sub-panel it should be so rotated that the leads from the inductances L4 and L5 come out at the bottom and they should be connected as follows: The end of the coil L4 nearest the edge of the tube to the left in figure 10 is to be connected to the minus A terminal on the oscillator tube socket which is two or three inches to the left of the oscillator coil. The end of L4 nearest the center is to be connected to the G binding post on the oscillator tube socket which also goes to the stator plates on the seven plate condenser. The end of inductance L6 which is nearest the edge of the tube to the right connects to binding post Z which is the plus B. The end of L5 which is nearest the center connects to the P binding post on the oscillator tube socket and also to the rotor plates of the seven plate condenser. Connected in this way the tube will oscillate easily over the entire wave length range but if these connections should be re-

versed on either coil there may be no oscillation at all.

Binding Post Connection

There seems to be some doubt in the minds of readers as to the connections of binding posts U, V, W, X, Y and Z at the rear edge of the sub-panel. Binding post W is the negative A, X is the plus A, Y is the plus 45 B and Z is the plus 90 B. U and V are the antenna and ground connections.

Referring to figure 10 it will be noticed that there is a lead from the P binding post on the socket in the upper left hand corner to the secondary of the filter coupler and this connection is also not as clear as it possibly should have been. It was presumed that with figure 2 and figure 10 before them, readers would understand that this wire went to the threaded brass rod running through the filter coupler, as this rod is connected to the copper segment of the semi-variable condenser on the end of the filter secondary. As described under the construction of the filter coupler the tin foil segment connects to one end of the filter secondary so the copper must go to the plate of the second detector tube to secure regeneration.

A typical letter from the many coming in is as follows: "Radio Digest, I finished my hetduogen on Thursday last (Jan. 22nd) and got locals fine that evening. It was not until last evening (Jan. 24th) that I got on to the trick of tuning, and then, Oh, boy! how they came in. It has a much better tone quality than my neutrodyne and the third stage of audio

frequency amplification works O. K., much to my surprise. It is surely some trick to tune, but when you get it, you've got something."—E. T. B., Cleveland, Ohio.

Through typographical error in the list of parts, readers were asked to do the impossible and place an outfit 10½ inches deep in a 10-inch cabinet. Several readers have called the writer's attention to the fact that 1½ inches is to be left between the rear surface of the front panel and the front edge of the base panel and that the base panel is 9 inches wide; thus there must be 10½ inches depth inside the cabinet. The list of parts specified a cabinet 10 inches deep and it is, of course, impossible to place a set built according to the above specifications in such a cabinet. The list of parts should have given the cabinet a 10½-inch depth dimension but if readers have difficulty getting such a cabinet, no harm will be done by moving the base panel ½ inch to ¾ inch nearer the front panel.

Battery Consumption

A battery on a 0.25-ampere tube operating to an end point of 1.0 volt under usual intermittent service will give over 100 hours of service; two batteries in parallel will give approximately 250 hours. In other words, two batteries connected in parallel will give more than double the service of a single battery.

Batteries are connected in parallel when the positive terminal of one is connected to the positive terminal of the other. This method of connecting batteries does not

change the voltage of the combination, but increases the energy delivered; or, in other words, the hours of service.

Batteries are connected in series when the positive terminal of one is connected to the negative terminal of another. When connected in this way the voltage of the combination is equal to the sum of the voltages of the individual batteries. Thus, a 4.5-volt A battery is composed of three individual A batteries connected in series, each cell having a voltage of 1.5.

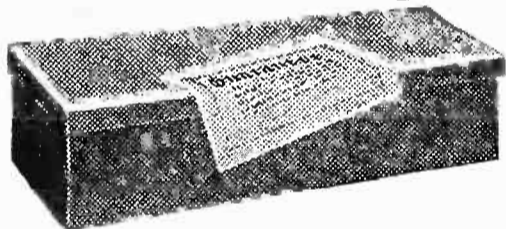
Pigtail Connections

The connections to movable parts of a Radio set are made by either a pigtail or a friction contact. The latter consists of a bearing or a spring washer that will make contact to the shaft of the rotating member.

Pigtail connections are made by soldering a flexible wire to the movable part of the device. The pigtail connection is the most efficient method of making this type of connection because it is positive, whereas with the friction contact the bearing or washer begins to wear and in time it will become loose, therefore making a poor connection. If rotating parts of your receiver have friction contact it can be improved by soldering on a pigtail or flexible wire.

To cut a large circular hole in a panel drill a circle of holes, close, but not uncomfortably close together, with a number 27 drill, then drill out with a number 19 drill. Dress up with a half-round file.

For Circuit Supremacy— CIR-KIT and Supereflex



Erla Supereflex—new epoch in circuits. Not just a "wave" of popularity, but the permanence of *basically* superior principles, just as advanced today as when Erla introduced the circuits still rated more powerful, tube for tube.

Expressing the best of Erla science, Supereflex circuits also are so easy to own! Not only because of extreme economy in first cost and operation, but also because Erla CIR-KIT enables any experimenter to produce these greater circuits flawlessly. CIR-KIT provides every needed item of Erla Precision Radio Apparatus—exclusively responsible for matchless Erla range, volume, clarity, sensitiveness and remarkable ease of control.

CIR-KIT also provides full-size blueprints; stenciled baseboard; and drilled, lettered panel, so that every step must be correct. Assuring lasting supremacy in circuits; the pride of a truly professional hook-up; and incomparable entertainment, CIR-KIT is outstanding in radio today.

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Erla complete radio instruments lift radio to the realm of art, with the same superiorities CIR-KIT brings.

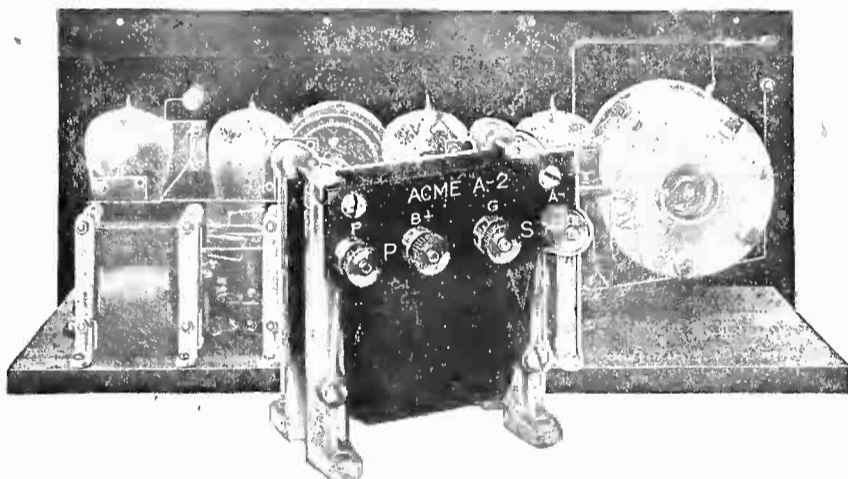


Erla Floor Console

Erla Table Cabinet

Erla Table Console

You can give your set this big advantage—



Amplification without Distortion

How to make sure of getting
everything loud and clear

YOU can make your set so that it will reproduce clearly and distinctly without distortion. The real pleasure in radio comes when you can understand and enjoy what you hear—voices that are natural—music that is clear in tone. In order to hear clearly and distinctly you want to be sure that you are using amplifying transformers that amplify the sound without distorting it.

Give your set this big advantage—Amplification without Distortion. Whether you have a neutrodyne, superheterodyne, regenerative or reflex, the addition of the Acme A-2 Audio Amplifying Transformer will make it better.

The Acme A-2 has become famous among radio owners for increasing the volume of sound without distorting. If you are bothered by distortion, try an Acme A-2 and note the difference.

Each transformer is tested and carries a guarantee tag. If you want Amplification without Distortion use Acme Transformers in the set you build and insist on

them in the set you buy. (That's one of the big reasons why the Acme-flex Kit-set gives such good results—it uses Acme Transformers.) Send for our 40-page booklet which explains how to get the best results by proper amplification and also contains a number of valuable wiring diagrams. It will help you build a set. Mail the coupon with 10 cents.

ACME APPARATUS COMPANY
Transformer and Radio Engineers and Manufacturers
Dept. N2, Cambridge, Mass.

Have the fun of making your own radio set

ACME

~ for amplification

ACME APPARATUS COMPANY,
Dept. N2, Cambridge, Mass.
Gentlemen: I am enclosing 10 cents (U. S. stamps or coin) for a copy of your book "Amplification without Distortion."
Name.....
Street.....
City.....State.....

"For Amplification without distortion" use ACME Transformers in the set you build. Insist on them in the set you buy and enjoy all the year round Radio

The amplifying transformer is the Magnifying Glass of Radio

Radio Digest

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Illustrated

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Vol. XII Chicago, Saturday, February 14, 1925 No. 6

"The Machine Wreckers" Revised

By "Steve" Trumbull, Chief Announcer of KYW

ERNEST TOLLER, imprisoned German playwright, wrote a play called "The Machine Wreckers." The situation used in the piece was that of the alarm among the weavers when the first piece of machinery was brought into England.

Mass meetings were held in the dead of night. The machines would deprive all of their livelihood. There were bloody riots, and the first machines were destroyed.

That is the play of Herr Toller. But somehow, the years that followed saw readjustments. More machines came. The workers used them. The cries of alarm died away.

A 1925 version of that very same plot was staged just a few nights ago in New York. Theatrical producers, actors, stage hands, musicians and artists gathered in solemn assembly. The gauntlet was thrown down and open war declared upon the machines—upon Radio.

William A. Brady arose before the alleged-to-be-enlightened audience. Prefacing his remarks with the assertion that the theater, the phonograph, and the Radio were in combat to the death he added:

"Don't let our actors and actresses, by entertaining for nothing, aid the building up of a process that in the long run may prove their own destruction."

The multitude marveled. Down with the machines! "Who wants to hear disembodied voices playing dramatic scenes?" demanded Louis Wolheim.

"Resist what will injure your livelihood," demanded Frank McGlynn. "That livelihood is hard enough to get now." Further, Mr. McGlynn pictured actors thrown from their jobs by this Radio demon, and chopping wood—actually chopping wood!

Perhaps there are cases where that misfortune would actually be hailed with relief by a suffering public—but this is beside the point. Let us rather, on a basis of plain facts and experience, tell what has been the experience of the Westinghouse station at Chicago with the theaters.

There are two theater pieces in Chicago that are in their second season, "No, No, Nanette," and "Abie's Irish Rose." Both have been broadcast.

Next in the line of long runs comes "Applesauce" and "White Cargo." Both of these have been micro-phonized by KYW.

Then there was the matter of the Duncan sisters, who threatened to become as permanent an institution in Chicago as the Art Institute. They fitted out a Radio studio at their own expense, and broadcast a regular program. There was never a hint of wood chopping around their box office!

Is all of this mere coincidence? Hardly that. At least the managers of these shows fail to believe it.

Frank P. Gozollo, veteran theatrical man, wrote to KYW following the broadcasting of "Abie":

"Never in my twenty-five years' experience as a theatrical manager have I known of a single venture bringing in such returns at the box office. In the forty-eight hours, by actual count, 2,876 people bought tickets who had heard the play from your station."

These are just a few of the facts. There is another angle, too. The Chicago Civic opera just announces a deficit of \$400,000 for the past season. The opera was not broadcast this year. Last year it was—and the deficit was nothing near as high as \$400,000.

Another coincidence, perhaps!

Just the other day there was a party of down-state callers in the KYW studio. Invited to return to witness the evening broadcasting they replied that "they were going to take in a show."

"What show?" we asked.

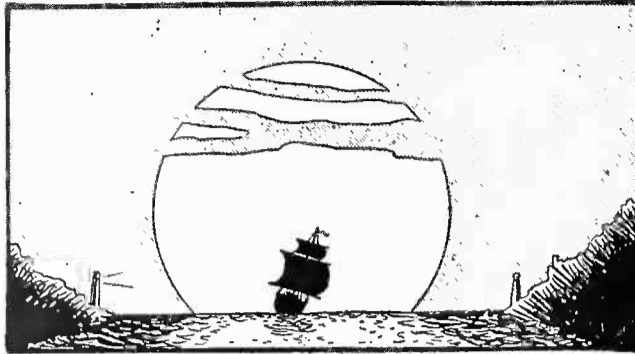
"Applesauce," was the answer, "We heard it down home on the Radio. We could even hear the audience laughing. It must be a funny show."

Just a few more facts, facts that might aid in answering the Messrs. Brady, McGlynn and Wolheim—and other 1925 "Machine Wreckers."

Radio rests its case. Let the jury of the public retire to deliberate.

RADIO INDI-GEST

Indi's Expedition Now on the High Seas



Due to the bravery of Capt. Oneoar, master of the good ship "Kanoofis," the long-heralded expedition originated by Indi-Hlself, is at last under way for the beautiful little island of Walla Walla.

As the ship was about to sail last week, mutiny broke out among the crew, but it was nipped in the bud by the Captain, who chased the mutineers off the ship. To give the readers of this column an idea of the initiative of Capt. Oneoar in a crisis of this sort, we will describe in detail just how he accomplished this unusual feat.

Standing in the middle of the ship, he hurled defiance at the crew and dared them to try and subdue him. Accepting the challenge, the crew rushed as one man towards him, but Capt. Oneoar had not sailed the seven seas for nothing and, using a trick which he picked up in the Fiji islands, he slipped from them and ran ashore.

The crew seeing the captain run off the ship, chased after him. They were soon lost from sight. About an hour later the captain came around the corner of one of the buildings with an entirely new crew. What happened to the other crew no one knew. But Capt. Oneoar promised to tell the story as soon as the ship had started on its way for Walla Walla.

Just as the sun was sinking in the West, the "Kanoofis" sailed down the bay and headed for the open sea, adventure, mystery and everything else you don't read about in this column. Each week a story will appear here telling the progress that the expedition is making. This will be an exclusive Indi-Gest feature. Be sure to order your copy of Indi-Gest each week so that you don't miss an installment of this thrilling, heart throbbing story.

And Tune in from Jail

Ray: "I hear WBZ is giving information on how to fill out your income tax report next March."

D. Owe: "But what if my set can't tune in WBZ?"

Ray: "Why—don't fill out a report!"

SPIDER WEBB.

May Blessings Rest Upon His Head

May blessings rest upon his head,
The man who keeps his signal down,
Though yet he lives and is not dead—
May blessings rest upon his head!

May blessings rest upon his head,
The man who keeps his set in place,
Who never lets her rant 'er tear—
Does not pollute his neighbor's air,
God bless his face!

May blessings steep his worthy dome,
Who's satisfied to hear from home,
Who's mit does not slap on the juice
In reaching out for something loose,
He's something great!

May blessings rest upon his head,
The man who keeps his signal down,
Though yet he lives and is not dead—
May blessings rest upon his head!

RUSSELL LEWIS.

No!—They Are Modest (in Walla Walla)

Dear Indi: If that proposed expedition is not for "Stags Only"—book first-class and ample reservations for my little typewriter and me.

In this day of boyish bobs and girlish giggles you men can't drag us around by the hair.

I want to be appropriately attired. Are shredded wheat skirts still being worn in the South seas?

MAMA HAYMES.

"Paging Eddie Squires!"

Dear Indi: For the last few months I've been listening on my Radio to nothing else but these "missing person" songs, such as "Where's My Sweetie Hiding?" and "I Wonder What's Become of Sally."

However, I have a more important question to ask you than either of them and it is, "Where the Heck is Eddie Squires gone to?" Eddie was one of KDKA's many announcers and he sure was the microphone's garters.

I ain't heard Eddie's voice for a long, long time, and I certainly would like to know where he vanished to. Maybe you or some of your pals (including Mrs. Partington) can solve this riddle.

GLOOMY GUS.

Indi's Non-Radio Eclipse Test Observations

Roosters that started crowing at dawn and ceased at totality of the eclipse, didn't have time to go to roost during the brief space of total obscuration of the sun, observers reported, and quickly resumed their crowing.

The great flock of seagulls which pass the winter days feeding along the Chemung river, near Elmira, N. Y., were fooled by the eclipse. As the moon blotted out the sun and darkness fell, the thousands of gulls rose from the river and started for Watkins, twenty-two miles distant, where they roost nightly.

Before they were out of sight of Elmira the shadow began to leave the sun and the gulls turned back to the river.

Why?



Condensed

By DIELECTRIC

If you sometimes feel that you would like a little Russian music other than the Song of the Volga Boatmen, tune in on some of the Los Angeles stations and try to locate the Calmon Luboviski Trio. This distinguished trio has found its Russian numbers meeting with great favor and they do play as few strangled trios can play. The dull throb of the melancholy strains that you find in many of the Russian works, affects the Anglo-Saxon mind strangely and Mr. Luboviski knows how to bring the effect out with his magic bow. And if Claire Forbes Crane will only play a piano solo, the evening is complete.

There are dance orchestras and dance orchestras. Dance music wherever you turn. But do you ever listen to KNX broadcasting by remote control from the famous Cocomat Grove at the Los Angeles Ambassador hotel? The Grove is the stamping ground for the movie colony and in addition to listening to the snappy music of Abe's famous Brunswick recording orchestra, you will hear him sing out many famous names of the screen as parties enter the Grove. Tuesday nights the Town Crier snatches many of them away from the dance floor and practically forces them to make short speeches between numbers. Truly a treat for the movie fan who is also a Radio bug!

There was one evening when WTAM was on the air with all of the old reliable tango and fox trot pieces—not one missing—and it's a sure bet they couldn't accommodate in their studio all those who were tripping the light fantastic to the music. On with the Radio dance!

More and more the greater singing artists are being heard by Radio until eventually, it is hoped, we may have them all listed. WOR put on a special concert presenting Spanish talent with the expectation of reaching Europe. The singing of Madame D'Alvarez was as natural as though she were on the concert stage, where it is well known.

While a goodly number of us listeners have been hugging the warm spots in our homes while listening in, there came the comforting news of real warm weather from WMBF at Miami Beach. Much more than that has left the mike 'way down in Florida to give the rest of us pleasure: orchestras, soloists and the usual Radio features, but with the stamp of "choice" upon them. Everything, so far, has been of that class.

WHAM has the good fortune to include in their list of entertainers the Eastman orchestra, which is a well trained musical organization. They play equally well the heavier classical numbers and those in a lighter key. Following the usual evening concerts there is given a competent and pleasing resume of the works to be heard succeeding evenings. There is a feature never disappointing to the music lover.

To anyone with a predilection for harp music, a treat was presented through our school of chiropractic station, WOC. Mr. Baumgrass, the skillful harpist, presented selections of considerable merit in a way to please the most critical. Perhaps a return engagement can be arranged. Certainly a large audience was tuned to his playing.

In most cases we hear "Tommy Lad" sung by male voices, but WBAV offered that familiar song as rendered by a soprano. Both this number and others on her program were acceptable and aid in raising our esteem of this Ohio Radiocast station.

How to Make the Two Tube Knox Reflex

Part II—Assembly of Panel and Baseboard

By W. H. H. Knox

IN THE first article which appeared last week the data for winding coils was given so that the reader could construct his coils while waiting for the rest of the parts if it were necessary to order these by mail. Assuming that the parts given in the list included as part of the first article are now at hand, and the coils finished, we are ready to lay out the set. The panel drilling layout is shown in figure 5 and this is to be enlarged on a sheet of paper to full size so that it may be used as a drilling template. The small individual templates which accompany the different units to go on the panel are to be pasted on this full size template in their proper positions. The usual condenser template shows one hole for the shaft and three for mounting the instrument itself, so it will be necessary to enter the shaft holes on the small templates exactly on the shaft holes indicated in the layout. The same is true of the eostat templates as the average rheostat requires a shaft hole and two small holes for 6-32 machine screws. If a wooden baseboard is used, the three holes across the bottom of the panel as shown in figure 5 will be necessary, but if a bakelite or hard rubber sub-panel is utilized, to be supported by angle brackets, the builder will have to figure out just where the holes should go for the brackets.

Identifying Panel Holes

The three .0005 mfd. variable condensers to be mounted behind the three holes shown on the horizontal line midway the height of the panel. It will be noted that there are two holes 1 1/8 inches from the center of the panel, which are for the midge detector and the adjustable crystal detector. The detector goes in the hole to the right. The two holes exactly below these and 1 1/4 inches from the bottom edge are for the rheostats. Slightly between these last two holes and nearer the center are two larger holes, one of which is for the filament switch and the other for the phone jack. The filament switch goes to the left and the phone jack to the right.

The full size drilling layout may now

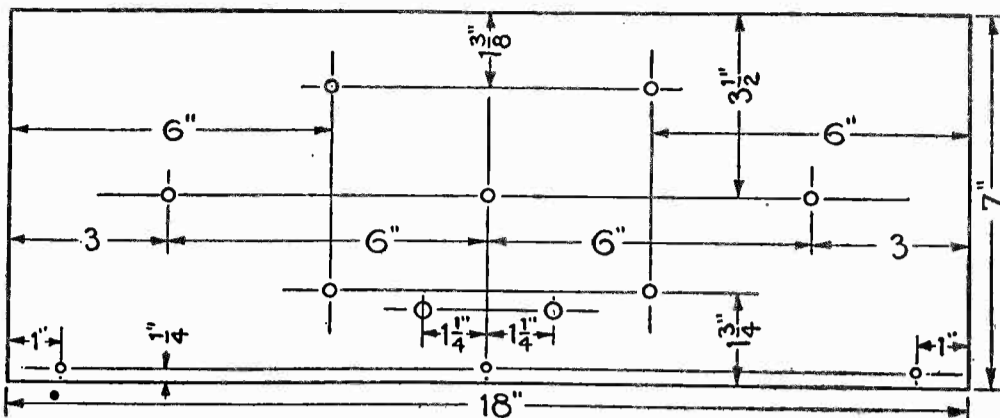


Figure 5

either be pasted or clamped to the panel and the holes center punched for drilling, after which the numerous holes can be

Assembly of Baseboard
The baseboard layout is shown in figure 6, and the placing of the apparatus

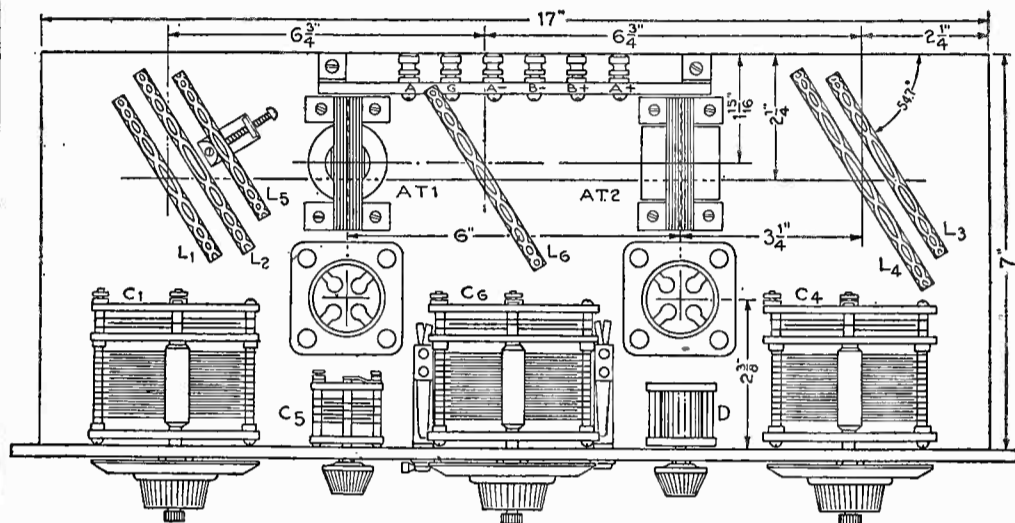


Figure 6

drilled with the proper size drills as indicated on the small templates which accompany the apparatus.

will be the same whether a wooden baseboard is used or one of bakelite or hard rubber. While slight deviation from the

layout shown may be done on most of the apparatus, the placing of the coils should not be altered from that shown. Other positions for the coils and other distances between them have been tried and it was found that best results were secured when the coils L1, L6 and L4 are centered as shown. Any method of supporting the coils on the baseboard which suits the builder's individual fancy or material on hand, may be used, with the single exception of L5, which requires a variable support shown in figure 7. This support may be constructed of a strip of heavy brass or aluminum 1/2 inch wide and 1 11/16 inches long. It is to be bent as shown 5/8 inch from one end. A threaded nut or washer is to be soldered near the top of the 5/8-inch length and is indicated as item B. A long machine screw indicated as item D is inserted through this washer or nut so that it will bear against the spring, item A. This spring is attached to the right angle strip by one of the screws which holds the strip to the baseboard. This spring may be either an old piece of clock spring or spring brass, and the other end of this spring is attached to a small piece of bakelite or hard rubber inserted into one of the openings in coil L5. L5 is to be varied in its relation to L2 only when a change of tube is necessary, as once this relation is adjusted for a tube it does not need to be changed.

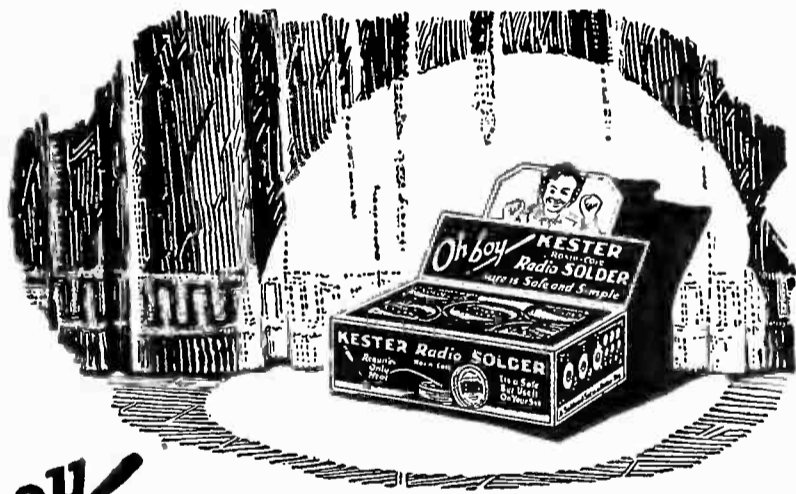
Coils L1 and L2 should be mounted so that their windings are in the same direction and they should be about 1/8 to 1/4 inch apart. Coil L5 is to be secured in such a way that its windings will be in the same direction as those of L2. Coils L3 and L4 should be so mounted that their windings are in the same direction and they should be 1/8 to 1/4 inch apart.

The binding post strip, shown at the rear edge of the baseboard may be of a strip of bakelite or hard rubber 1/2 inch to 1 inch in width and 7 1/4 inches long. Its thickness can be 1/8 inch, 3/16 inch or 1/4 inch, depending on the material which the

(Continued on page 18)

KESTER Radio SOLDER

ROSIN-CORE



Oh boy but it wins Approval

Jack Binns knows, and here's what he says in Collier's: "Never use any of the messy soldering pastes. This is quite important, because it causes a lot of noise in your reception. The only material to use is rosin. Suitable strip solder can be obtained with a rosin core which makes the task of soldering a simple one."

Not only has Kester Radio Solder won the approval of the leading radio engineers and laboratories, but it has also won the approval of thousands of users. Listen to what one of these fans says about it:

"I find Kester Radio Solder so good that I refuse to use any other make. I wired an 8 tube Super-Het. with your solder and it worked perfectly. I am now using my third can, and have recommended it to several of my friends who have been using inefficient and harmful soldering pastes and fluids of various kinds. They report much pleasure and satisfaction by changing to Kester Radio Solder."

Kester Radio Solder has a pure rosin flux inside of itself which makes absolutely non-corrosive joints and prevents dielectric losses. It requires only heat. By using a good hot iron and having it touch the parts to be soldered, a neat, clean job quickly and permanently safe is the result.

Insure safely soldered joints in your set by purchasing a can from your dealer today, or sending this coupon to us.

CHICAGO SOLDER COMPANY

4238 Wrightwood Avenue

Chicago, U. S. A.

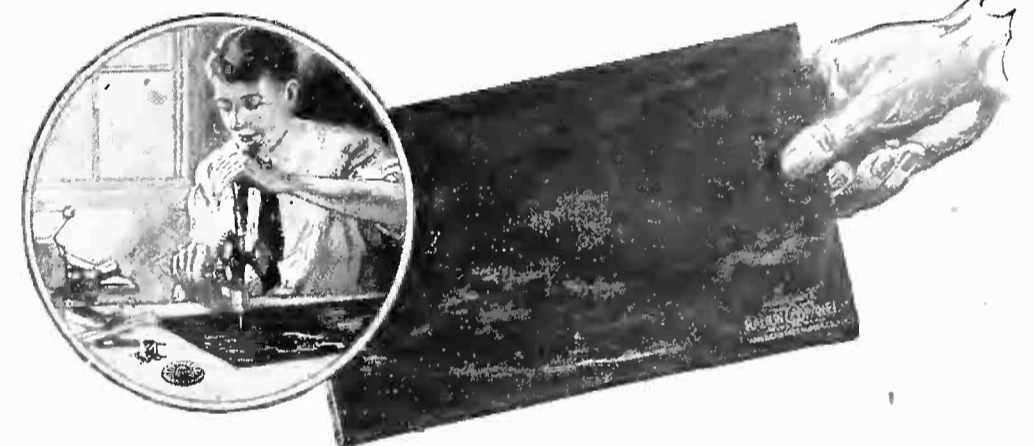


RADIO BROADCAST

POPULAR SCIENCE



POPULAR RADIO



Just use ordinary tools on this panel—built to order for radio

YOU don't need special tools to do a good job on a Radion Panel. Just the usual tools found around any house will give you clean-cut, workmanlike results. You need not have the slightest fear of chipping.

Radion is the easiest of all to cut, drill and saw. It was developed to order by our engineers to meet the demand of radio set builders. There is nothing quite like it for real results.

Highest rating as radio-frequency insulation

Authoritative laboratory tests give Radion the highest rating as radio-frequency insulation. This means that losses from surface leakage and dielectric absorption are exceptionally low. And low losses mean clearer reception, more volume and more distance.

You can see that Radion is different by looking at the finish. But that high-polished, satin-like surface is not for beauty alone. It's useful, too. Moisture and dirt cannot gather to cause leakage and leakage noises.

Radion resists warping. It's strong. It's moisture proof. It comes in eighteen stock sizes and two kinds, Black and Mahoganite. Radio dealers have the exact size you want for your set.

Send for booklet "Building Your Own Set"

Our new booklet, "Building Your Own Set," giving wiring diagrams, front and rear views, showing a new set with slanting panel, sets with the new Radion built-in horn, lists of parts and directions for building the most popular circuits—mailed for ten cents. Mail coupon today.

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2 TUBE KNOX REFLEX

(Continued from page 17)

builder may have on hand. It is supported vertically by means of two right-angle brackets placed as shown at each end of the strip. The arrangement of binding posts shown, to be used as aerial, ground, A minus, B minus, B plus and A plus will be found convenient for the wiring. Their order may be changed to suit the individual builder, but the one shown is very convenient.

Assuming now that all of the parts

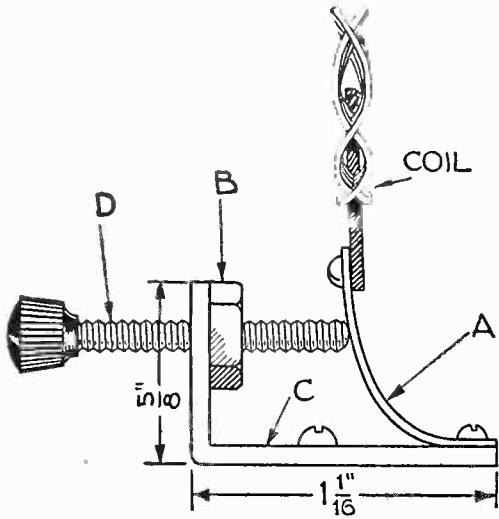


Figure 7

have been assembled on the panel and on the baseboard, and the baseboard attached to the panel either by screws or with brackets, we are ready to commence the wiring. The wiring diagram shown in figure 2 of part one is to be used, the only item not shown in that diagram being the filament switch. This is to be inserted in the circuit in the plus filament lead between the plus A binding post and the point about 1/2 inch above it where a wire branches off to the right going to the second filament. Bus bar will be found excellent for wiring this set as this receiver lends itself readily to the right angle method of wiring. Particular care should be taken in this work and the usual reflex precautions observed. Be especially careful that grid and plate leads are not parallel and are kept as far apart as possible. Be sure that all soldered connections are actually soldered and not just stuck together with soldering paste.

Coil Connection Important

The connections to the coils are as follows: The inside end of coil L1 connects to the antenna binding post and the outside end connects to the ground binding post. The inside end of coil L2 connects to the F minus end of the audio frequency transformer AT1 and the stator plates of C1; the outside end of coil L2 connects to the inside end of coil L5 and the minus A binding post. The inside end of coil L5 also connects to the rotor plates of the .0005 mfd. condenser C1. The outside end of L5 connects to rotor plates of

L6 connects to the P binding post of the primary side of AT2 and the outside end goes to the P binding post on the socket. By following the diagram the balance of the wiring will be found easy, but the connections of the coils must be adhered to strictly as described or the set will not work correctly.

When wiring this receiver it will be found an excellent plan to go over each wire on the diagram with a red or blue pencil, as that wire is placed in the set, so that no wires will be omitted nor the same connection made twice, which can very easily happen. The fixed mica condenser shunted across the secondary of

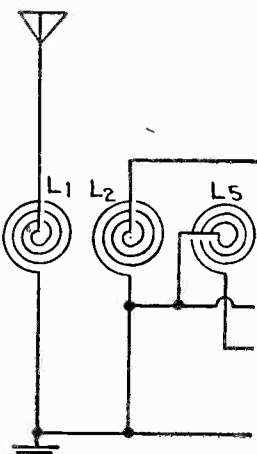
AT1 and labeled C2 has a capacity of .001 mfd., the condenser across the primary of AT2 and labeled C3 has a capacity of .006 mfd., the condenser across the primary of AT1 and labeled C7 has a capacity of .0005 mfd., while the condenser labeled C8 has a capacity of .0001 mfd.

(In the next issue Mr. Knox will go into the adjusting and tuning of this unusual reflex so that readers can duplicate the exceptional sharp tuning and strong volume which the author obtains in Los Angeles.—Editor's Note.)

See that the voltage of the charging device is higher than that of the battery.

Correction

The wiring diagram of the Knox Reflex was shown as figure 2 in Part 1 of this series of articles. No connection to ground was indicated in that diagram so this correction diagram is shown that readers may add the ground symbol and connection to figure 2.

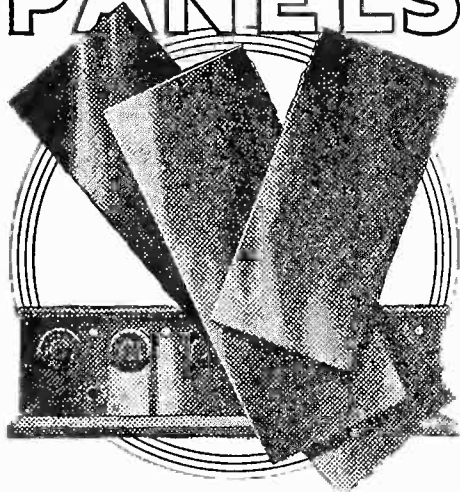


midget condenser C5. The inside end of coil L3 connects to the B plus post of the primary side of audio transformer AT2 and the outside end connects to the plus B battery binding post. The inside end of coil L4 connects to the rotor plates of C4 and the P binding post on the primary side of AT1, while the outside end connects to the stator plates of C4 and the crystal detector. The inside end of coil

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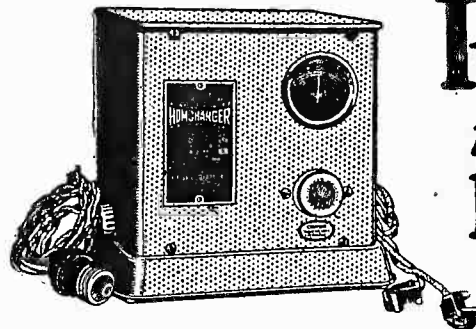
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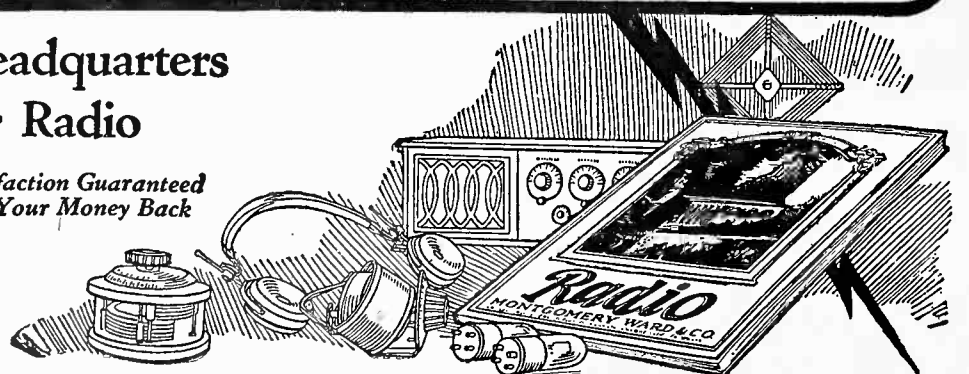
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Broadcast Listener's Reference Library

Part II—Distance and Reception Limitations

By Edward Thomas Jones, A. I. R. E.

OF COURSE crystal set owners are not interested in questions such as these: How far can I receive? Facts about fading? What constitutes results? The truth about static. They very seldom ever bother about static because they are (necessarily) so close to the broadcasting station that the broadcaster's signals are more powerful than the static. But, to the broadcast listener making use of any other type of receiver, these are very vital subjects and are the things which he should know a little about.

There is an absolute need for a clear explanation regarding the facts which determine the distance a receiving set can pick up broadcast news, music and other interesting matter. With this in mind I will endeavor to bring to light the very factors upon which good reception depend.

To begin, it might be said that a receiving set itself cannot receive any further than the box or cabinet it is installed in. From this, it should be clear that the transmitted waves must reach the receiving station's antenna.

Sensitivity

Many have asked why it is that they could hear Pittsburgh or even Detroit several hundred miles distant and yet they could not hear another station operating but seventy-five miles away. The waves of the smaller stations operating seventy-five miles away did not reach their receiving antennas, consequently there was no reception to be had.

The foregoing conclusion brings up the question often asked regarding the sensitivity of a receiver. The larger the facilities of the manufacturer and the better the engineering skill, the more sensitive will the receiver be. Such a receiver is apt to respond to waves which barely reach the receiving antenna, while a less efficient one will not record the presence of the waves in that vicinity. This is the only difference between receiving sets today. Their inherent ability to pick up broadcast stations thousands of miles away is due to the skill, workmanship,

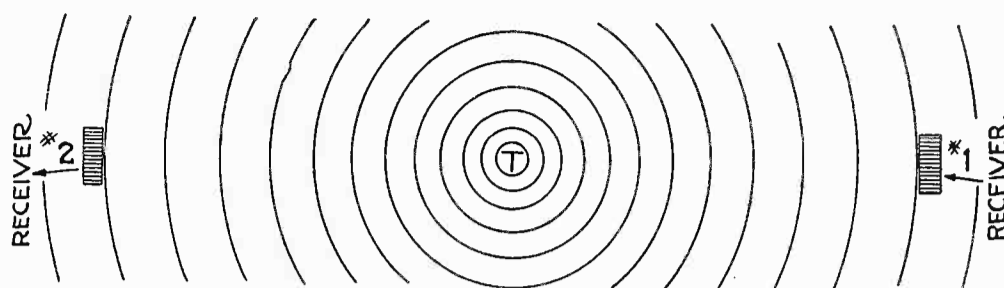


Figure 7

engineering ability and overall efficiency of the manufacturer or builder.

In figure 7 two receivers of different construction are shown. The waves from the broadcasting station T barely reach their antennas (this is the point of practically zero current) no response is had at receiving station number 1 even though the same number of tubes are in operation. At station number 2 reception is being had from the broadcast station because the receiver, while using the same number of vacuum tubes has been constructed along engineering lines, and every precaution was exercised to build an efficient receiving set.

Striking examples of the above come from inexperienced constructors who have built their own sets. They want to know why it is that they cannot receive as far as their neighbor who has in use a set manufactured by one of the large manufacturers, or a set he constructed himself along the lines mentioned.

Weather

Then, we also have the weather conditions to take into consideration. Consider that an efficient receiver is being employed for the reception of concerts being sent out by the most prominent and powerful stations in this country. We do not hear Memphis or St. Louis as loud as we had them last night. The first thing one is apt to think is that the receiver has gone wrong. Not so! A change in weather conditions will alter Radio receiving conditions and you must be governed accordingly.

Then there are the fading problems—when the signals walk in—and walk right out again. This condition cannot be helped at the receiving end—and as far as we know—not at the sending end either. Nothing that you can do to or with your receiver will help. It seems to be a condition due to change of atmospheric conditions between the sender and receiver. Therefore, if you have a certain station tuned in well, do not try resetting the dials when the station begins to weaken. You only make matters worse, simply because it is harder to tune in the station with diminished signal strength, and if the signal gets too weak you may lose the station entirely.

If "fading" is very pronounced on any particular station, try tuning in some station in another direction. Conditions between you and that station may be entirely different. That accounts for the variable results obtained each night from a given number of broadcasting stations.

Static—the misnomer—for it is not at "rest," and according to Webster. It is moving just a trifle too much for us. Several devices have been used to good advantage in eliminating a good portion of this interference—and for one the author's underground system. However, the real solution is very powerful broadcasting stations permitting detuning of the receiver, that is, losing the static and

still retaining the broadcasting station, because of its greater strength.

(Antennas and grounds, being a source of much of the discouraging results fans meet, are taken up next week by Mr. Jones.—Editor's note.)

Harmonics and Meters

Harmonics of a broadcasting wave are the higher frequencies, representing exact multiples of the fundamental frequency. For example, suppose a station is sending on a wave length of 600 meters, which is a frequency of 500 kilocycles. This is then the fundamental wave (for frequency). But if the antenna arrangements are bad, or for many other reasons, the wave actually sent out may contain also a frequency of twice 500 kilocycles, or 1000 kilocycles, which corresponds to 300 meters. This is the first harmonic. Similarly there might be also a frequency of 3 times 500 kilocycles, or 1500 kilocycles, corresponding to 200 meters. This would be the second harmonic. There would be a third at 2000 kilocycles or 150 meters, a fourth at 2500 kilocycles or 125 meters, and so on. Of course, all broadcasting stations try to keep their sending wave as "pure" as possible, that is, to avoid producing these harmonics.

Directional Properties of Loops

The directional properties of a loop are altered by the presence of magnetic materials situated near it. The steel framework of a building has a detrimental effect on the directions of a loop. The buildings have the characteristic of casting shadows across the loop aside from distorting the directional properties. This condition is particularly true of pancake loops.

It is wise to keep the loop away from metal stairways and radiators. It is poor practice to place the loop too near the receiver, because interaction may result. Then, again, placing the loop too far away from the set will also cause trouble.

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The Reader's View

Simplifying Station Call Letters

In a recent issue of your excellent magazine a contributor published an article on the need of simplifying Radiocast station call letters so they could be understood by listeners in, and suggested the substitution of a 'code, which he stated was used with success by the signal corps during the war in the transmission of Radio telegraphic communications.

I agree with the writer that there is a dire need of some arrangement whereby a fan may be able to distinguish between such letters as B, C, D, E, G, P, T, V, Z, when pronounced by the announcer of some small station and even the larger distant stations, but substitution of the code suggested would be impractical as it would simply mean that every purchaser of a set would first of all have to memorize the code.

A much simpler arrangement would consist of simply grouping the letters of the alphabet according to their sound, then eliminate all but one letter from each group and use just one letter representing each sound group. A division of the alphabet according to sound, would be as follows: A, H, J, K; B, C, D, E, G, P, T, Z; F, L, S, X; I, Y; M, N; O; Q, U; R; W.

Selecting the letters from these nine groups which are most distinct and which would probably carry best, we would have A, E, L, I, M, O, U, R, W.

Owing to the fact that the international agreement assigns the letters K and W to the United States and these two are used as the first initial of all broadcasting stations, it would be necessary to use K in this list instead of A, as the first letter of a call, but A could be used to better advantage than K as the second, third or fourth letter.

A few minutes with a pencil and a sheet of paper will reveal that the letters I suggest will give perhaps twice as many call letter combinations as there are Radiocast stations in this country, with no two combinations sounding anything alike.

In fact, I believe that by using K and W as the first letters of stations, as is now done, and designating one of the others to be used as a second letter in the call to represent the various Radio districts, the fans would be able to tell which district a station was in as soon as the call was heard.

For instance: WAAE, WAAL, WAAI, WAAM, WAAO, WAAU, WAAV, WAAW, WAAZ, WAEI, WAEL, WAEM, WAEO, WAEU, WAER, WAEW, WALA, WALE, WALI, WALM, WALO, WALU, WALR, WALW, WAIA, WAIE, WAII, WAIM, WAIQ, WAIU, WAIR, WAIW, WAMA, WAME, WAML, WAMI, WAMM, WAMO, WAMU, WAMR, WAMW, WAOA, WAOE, WAOI, WAOL, WAOM, WAOO, WAOU, WAOR, WAOW, WAUA, WAUE, WAUI, WAUL, WAUM, WAUO, WAUR, WAUU, WAUV, WARA, WARE, WARI, WARM, WARO, WARU, WARR, WARW, WAWA, WAWL, WAWM, WAWO, WAWU, WAWR, WAWW, are four letter combinations representing Radio district number 1, for instance, and ten three letter combinations starting with WA can be added to this list, also quite a few four letter combinations which I have probably missed in running through the list.

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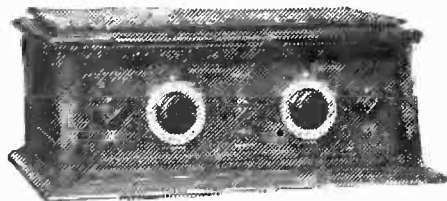
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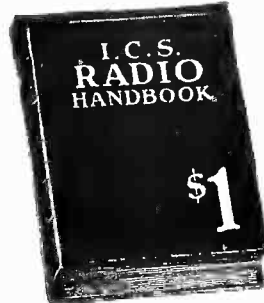


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Radio district number 2, and a similar number of combinations could be worked out for that district, and so on through combinations starting with WF for the third district, etc. Getting into western territory K could be used as the first letter, and another group of several hundred call letter combinations arranged, in fact there would be twice as many groups or combinations possible as there are Radio districts and if there are too many stations in one district for one distinctive letter to suffice, two letters, to be used as the second initial of the calls for that district, could be assigned.

This plan would of course necessitate the reassignment of call letters, which could be done very quickly by the department of commerce and which would cause confusion for but a very few days.—M. F. Hoyle, Hollister, Calif.

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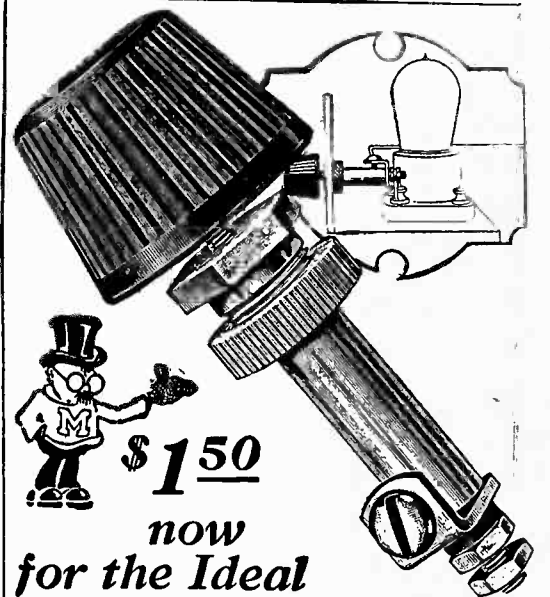
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B Battery Read With 10-Volt Meter

High Voltage Read on Low Scale Instrument

It is a comparatively simple matter to adapt your A battery voltmeter to read your B battery voltage. All that is necessary is to add the proper resistance. A

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THERE are many little kinks worked out at home that would aid your fellow Radio worker if only he knew about them. There are new hook-ups, new ways of making parts and various unique ways of operating sets that are discovered every day. Radio Digest is very much interested in obtaining such material. Send them in with full details, including stamped envelope, so rejected copy may be returned. The work must be entirely original, not copied.

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Radio Digest,
510 North Dearborn St., Chicago

25-watt or 40-watt mazda lamp placed in series with one meter lead will give just about the right deflection of the meter on full B voltage.

The meter and lamp may be mounted on a small piece of panel, as shown in figure 1, and three binding posts provided so that either A or B voltages can be read, as desired.

To calibrate the meter, use the circuit shown in figure 2. A reasonably accurate voltmeter of proper scale can probably be temporarily secured to serve for the comparison voltmeter S. This is connected to one side of a double-pole double-throw switch, and the new meter connected to the other side. Leads from the blade contacts go to the B battery. The voltage of the latter is varied by changing the number of cells in the circuit and the two meters read for each value of the voltage

40-WATT MAZDA LAMP IN SERIES

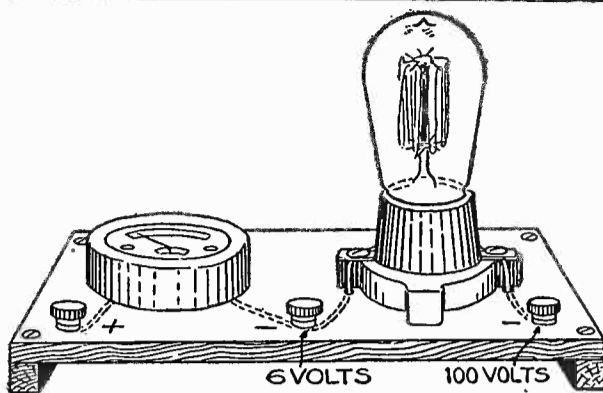


Figure 1.

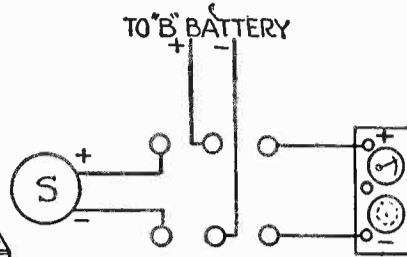


Figure 2.

which should cover most of the scale of the meter.

The readings taken are plotted in the form of a curve, which will be similar to that shown in figure 3. The values given

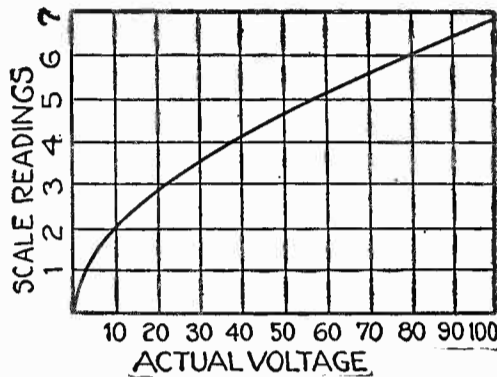
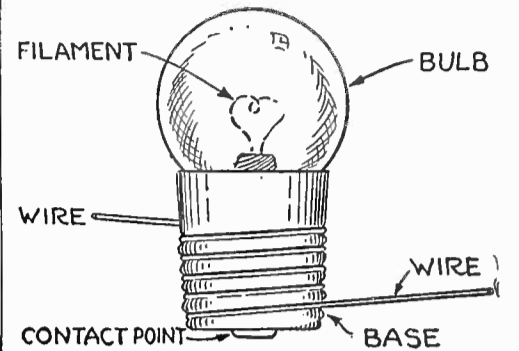


Figure 3.

there are those actually obtained in calibrating a meter such as is described here. By means of such a curve the actual voltage for any scale reading may easily be determined.—Louis L. Matson, Nela Park, Ohio.

Flashlight Bulb Makes Dry A Battery Tester

Procure a small pocket flashlight bulb and wrap or solder a small piece of wire around the base as shown. Bus or aerial wire will do. To test a 1½-volt dry cell



press the contact point of the electric bulb on the positive or center post of the battery and the wire on the negative or outer post. If the batteries will not light the bulb they should be discarded.—O. J. Miller, Cleveland, Ohio.

Stop Loud Speaker from Rattling

To stop rattling in your loud speaker unit drop a bit of shellac on the pin joint in the middle of the diaphragm. A narrow disc of blotting paper placed inside the cap so it laps over the edge of the diaphragm also will help.

Low Loss Apparatus

Low loss apparatus means coils and inductances free from great masses of dielectric surrounding them. If a tube or form on which the coil is wound must be used it should be very thin and non-absorbent. Closed metal paths should be avoided in the vicinity of inductances either as a part of the form, or of the mounting. Self-supporting coils don't mean anything where great daubs of "dope" are used. The wire itself can be heavy enough to give support and merely a thin layer of collodion used, if necessary anywhere, for protection against moisture.

Soft and Hard Tubes

A soft tube that contains a lower degree of vacuum is more sensitive as a detector in a Radio set. The hard tubes function best as amplifiers, however, while soft tubes are not as suitable for this use.

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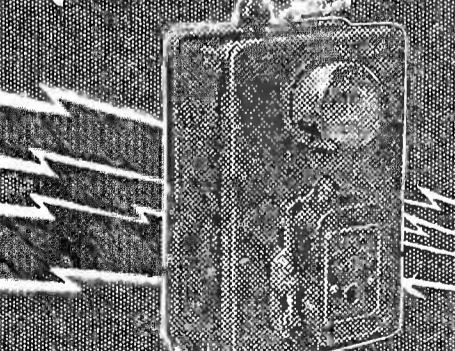
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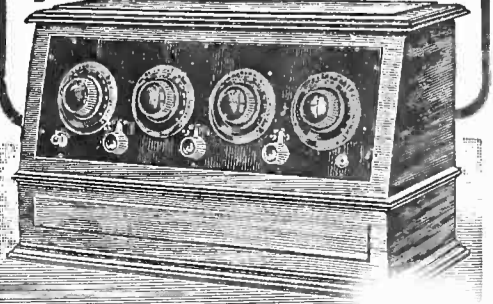
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Questions and Answers

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We are thinking of putting a small broadcast station in our church, and I have been asked to get some information on the cost of such an outfit. We would like a set with about a 200-mile average range, and as simple as possible.

Can power transformers be used for voice broadcast or would a motor generator have to be used? This for plate voltage.

We have 110-volt AC and can get 220-volt. If you have any hook-ups of something simple in a transmitter which would give good quality of phone transmission, we would be pleased to have them to look over.

A.—We must advise that there is no such thing as a 200-mile average range. The distance over which any transmitter can be heard varies every evening due to atmospheric conditions and the range is governed very largely by the sensitivity of the receiver. The smallest practical receiver today for reception around 200 miles is a single tube regenerative receiver and there are probably more of this type of set in use than any other. In order that these single tube sets might reliably hear programs every day over a distance of 200 miles it would be necessary to install a broadcasting station

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rated at 500 watts output. This is the rating of most of the class B stations in use at this time, among these being WQJ, WHAS, WMC, WHO.

These transmitters are purchased from the Western Electric company, the price being about \$10,000, with additional charges for installation and decoration of studio. The average upkeep of these stations runs anywhere from \$25,000 to \$85,000 a year.

Power transformers cannot be used as the 50-watt tubes require 1,000 volts on the plates and the larger tubes require anywhere from 2,000 to 4,000 volts on the plates. It has been found much better to use a motor generator than to raise the voltage by means of a transformer and then attempt to rectify it.

We have plenty of hook-ups for low power transmitters which probably would be heard occasionally at a distance of 1,000 miles on a five tube set but which at the same time could not be heard dependably over a distance of 200 miles on

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