How to Build Heteroflex, the Four Tu Gold Cup Standing; The A-B-C's of 7

# 

Vol. XIV

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SATURDAY,

# HEAR DIVER IN DEEP SEA



WGES Opens New Studio in

Chicago—Plant in Oak Park CHICAGO.—WGBS, Coyne Electrical school here, which station is located at the Oak Park Arms hotel, Oak Park, Ill., has opened its elaborate new studio in the Baldwin Piano building, in the Chi-caro loon cago loop.

Peeping out from behind her attractive summer furs up in the left corner we have Luella Drew Wilson, who has charge of the "Juvenile Period" at Walon, Chicago. Miss Wilson has had much theatrical and dramatic experience and is a niece of the famous John Drew. Way out in Utah, Ogden on the Overland Trail to be exact, Mary Fisher plays the same violin you see her holding here, at frequent intervals over KFWA. When the Two-in-One Players put "Her Engagement Ring" on the ether from WGR, May Schroer, right, will take an important part.

**BROADCASTS** FROM OCEAN

Second Test Successful

Remote Control From Bottom Carries Man's Voice Over Four Stations

ATLANTIC CITY.—"Down goes Mc-Ginty to the bottom of the sea," with a microphone in his diver's helmet and soon the fans away inland are hearing just what the wild waves are saying by remote control from Davy Jones' well-known locker



#### **BOOM! GOES RADIO** AS COIL EXPLODES

MISHAWAKA, Mich.—A thin coating of collodion, which is nothing more than gun cotton when dry, holding the wires on a bank wound coil firm exploded when a heavy static charge hit the receiver of George D. Getz near here during a severe electrical storm recently and blew the set an inch and a half out of the cabinet, though three half-inch wood screws held it in place. The remainder of the set including the five tubes was unharmed. An insurance company paid Mr. Getz \$8.50 for the damage. The current choose to break down the insulation on the primary of the antenna coupler rather than jump the eight-inch gap of the lightning arrester.

these are turned into Radio Digest in a group of CONSECUTIVE numbers, extra bonus votes are allowed the announcer for whom you are voting.

The ballots, top of page two, numbered consecutively, will appear in each issue of the Radio Digest until the close of the contest, with the August 22 number.

Each of these ballots will count for one vote when sent in separately. You can hold these ballots until you have 4 that are consecutively numbered, and when they are sent in a bonus of 8 votes will be allowed for your favorite announcer.

be allowed for your favorite announcer. For each 8 consecutively numbered ballots your candidates will receive a bonus of 20 votes. For each 16 consecutively numbered ballots, 30 votes. For each 16 consecutively numbered ballots, 40 votes. For each 20 consecutively numbered ballots, 50 votes, and for each 22 consecutively numbered ballots, 50 votes bonus will be allowed.

How to Vote and Get Bonus

Don't miss a single ballot, for when Digest, 510 N. Dearborn St., Chicago.

#### **ROUSE BACKERS ARE** SHOWING STRENGTH

THIRD MAN GAINS BUT MAC STILL LEADS CUP RACE

George Hay Now Trailing Leader by 13,000 votes—Others Change Their Standing

Although the name of Graham Mc-Namee still stands at the top of the sixteen leading contestants in the 1925 Gold Cup Best Announcers' race and George D. Hay is still in the place position, things are not slowing up a bit in the field running behind the pacemakers. In fact, a spurt by one of the trailers last week shows that there is a probability of the final sorre sheet having a name other than that of the "Bastern Sage" or the "Solemn Old Judge" at its top. Gene Rouse of WOAW, Omaha, is the man who made the big jump in votes during the past week.

past week.

While Rouse did not change position his followers succeeded in putting him in the 20,000 class by submitting 4,719 votes. At the same time McNamee's listeners succeeded in putting over 13,000 marks between him and Hay, an increase of 4,000 over last week. Hay leads G. R. by over 9,000.

Counting the ballot printed above there are only three left to be voted for your favorites. Owing to the bonus system of voting a large flood of ballots is expected from now on as the leaders come into the home stretch. Many things can happen, between now and the time the winner passes under the wire and you who have been holding out votes until the last can be very instrumental in making these things happen. It is folly for the Gold Cup editor to predict even at this late date the name of the winner. You who have the voting power know more about it than we do. All we can say is "May the best man win!"

#### Seven Position Changes

Seven Position Changes
That the bonus votes are beginning to get in their work is evidenced by seven changes in standing from the eighth position on down. Leo Fitzpatrick, who rated tenth last week, has passed Bill Hay and Lambdin Kay, and now stands eighth with the other two at nine and ten respectively, each a notch below their previous standing. Robert Emery went up two pegs from fourteen to twelve and at the same time Stanley Barnett dropped to the fifteenth place.

Levry Sullivan get Emery's old billet

to the fifteenth place.

Jerry Sullivan got Emery's old billet at fourteen, Charles Erbstein remained at the lucky thirteen marker, and O. E. Becker is marking time at the bottom of the sixteen chosen leaders. But, as we said before, even with the end in sight we would rather bet against Sande to even show in a horse race on a good mount than to try and pick the Gold Cup winner.

The Johnny Walker Sweepstakes

The Johnny Walker Sweepstakes
And now just as we were about to end
this story and run out for a bottle of
NEAR beer, comes a note from Frank
R. Haines up in Canada, "where there
ain't no eighteenth amendment and a
man can quench his thirst," saying in
part: "I had a party of friends at the
house one night last week and we decided
to run a little Gold Cup contest of our
own. After tuning in 25 stations we took
a vote resulting thusly: O. E. Becker, 17;
G. D. Hay, 3; H. W. Arlin, 3, and G. MoNamee, 2. We have decided to present
Mr. Becker a bottle of Johnny Walker
pre-war. But what is worrying us is how
are we going to send it to him. Anyway, it is here and the best thing Mr.

Becker can do is to take a run over the line and get it."

On,	yes, the standing is as follows:	
Posi	tion Name and Station Votes	
1.	Graham McNamce, WEAF 42,811	
2.	George D Hay WLS 20 867	
9.		
4.		
5.		
6.	H. W. Arlin, KDKA 10.655	
7.	H. W. Arlin, KDKA	
8.	Leo Fitzpatrick WDAF 6 186	
9.	W. G. (Bill) Hay, KFKX 5,074	
10.	Lambdin Kay, WSB. 4,934	٠
11.	N. Dean Cole, WHO 4.819	
12.	Robert Emery, WEEL 4.548	
13.	Charles Erbstein, WTAS 4.401	
14.	Jerry Sullivan, WQJ	
15.	Stanley Barnett, WOC 4.014	
16.	O. E. Becker, WGR. 3.427	
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#### Looking Ahead

The Much Discussed Oscillating Crystal, next week, will be taken up by Frederic M. Delano, our Paris representative, who followed M. Vinogradow over half of Europe to get the story from one who knew the subject thoroughly and knew, first hand, of the experiments of M. Lossev.

TEAF, Chief of the Link Stations, will be pictured and described in the next issue of Radio Digest. The American Telegraph and Telephone station in New York is one of the most beautiful in the country. Pictures of the studios and members of the personnel will be shown.

ree More Weeks for the Gold Cup Award to run, and who will win? Follow the standing from week to week. The contest closes with the August 22 issue, and competition is intense. Have you voted for your favorite?

pression of Radio Inductive Interference, as found by actual experience, is presented in detail by the department of marine and fisheries, Canada, as a sequel to this week's article on the sources of this interference.

Operation of Vacuum Tubes will be discussed by Professor Moreton in his next article of the A. B. C. Course. In this issue he tells why the various parts are placed within the bulb and next week he therefore describes methods of getting the most from these parts.

Newsstands Don't Always Have One Left WHEN YOU WANT

YOU WANT IT! BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW

#### SEND IN THE BLANK TODAY

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#### HEAR DEEP SEA DIVER

(Continued from page 1)

Vitain

(Continued from page 1)
ran through the helmet through a specially constructed opening which withstood the powerful pressure of the ocean at a depth of fifty feet, and allowed passage of the wires. The wires ran from his helmet to the small boat floating on top of the ocean, which in turn, was connected by waterproof cable to the Steel Pier, on which WIP maintains its Atlantic City remote control station, is approximately a quarter of a mile in length. Microphone wires from the boat were connected to the microphone outlet at the end of the Pier, then to the remote control station where they were amplified and sent over special long distance telephone wires to the transmitter of WIP located in the Gimbel Brothers' store, Philadelphia, after having passed through three separate amplifiers, and under the Delaware river.

Searchlight Added Feature

A remarkable feature of the broadcast on Saturday was an experiment conducted in conjunction with the Westinghouse Lamp company of sub-sea searchlights of small caliber for use in salvaging wrecks and locating bodies. Recently, they received a request for lights of ocean strength and able to withstand ocean pressure and projecting a beam of light through the dense ocean water.

The lights were built for use with the diving broadcast, being the most powerful sub-sea lights ever constructed. They consist of 1000-watt globes, the shell of the glass being more than a quarter inch thick. They were placed in large polished metal reflectors with a suitable handle, and connected to the high tension lines on the Steel Pier by waterproof cable.

Lights Prove Ruge Success
These lights were so powerful that while the diver was on the floor of the ocean using them in his explorations, people watching the feat from the Pier were able to follow the diver in his movements by the reflection of the light on the surface of the water. Westinghouse ensuring them in his explorations. The broadcast of Radio stations led by WIP from whose studio the energy originated. Station WGBS, Gimbel Broth

#### New Stations

Oakland, Calif., will have a new 1.000-watt broadcasting station when KTAB, the Tenth Avenue Baptist church, goes of the air this week. Church services will be broadcast Wednesday and Sunday. The rest of the week the programs will be high grade though not necessarily sacred. Miss Ada Morgan O'Brien, formerly program director at KPO, is the director. A 500-watt station is opening in Oakland owned by the Oakland Bducational society. This station using the call KFWM may be heard by dialing 224 meters.

KOIL, the new Mona Motor Oil station at Council Bluffs, Iowa, is owned by the Monarch Manufacturing company and operates on 278 meters, 500 watts. Tom Mackey is the announcer.

Other new stations licensed this week are: KFWF, St. Louis, Mo., 250 watts, 214.2 meters; WIBT, New York, N. Y., 100 watts, 211.1 meters (portable); WIBU, Poynette, Wis., 20 watts, 222 meters; WSAU, Chesham, N. H., 10 watts, 223 meters; WSAV, Houston, Tex., 100 watts, 248 meters; WTAD, Carthage, Ill., 50 watts, 235 meters.

Among the new superpower stations is WOK, Homewood, Ill. This broadcaster has opened a Chicago studio located in the Terrace Garden, Morrison hotel. Many other stations are increasing their power for the summer months. WCED and WCCO are using 5,000 watts; WEAF, 3,000; WTAM, 2,500; WTAM, 1,500. WAFD, Port Huron, Mich., and WMAZ, Macon, Ga., are now listed at 500 watts. WHAT, formerly KFMT, Minneapolis, is also operating on 500 watts.

KFAB, Lincoln, Nebr., is now a Class B station operating on 340.8 meters. WSBF are the new call letters of Stix, Baer and Fuller at St. Louis. This station formerly used. WCK. WSY, Auburn, Ala., will reopen in the fall with a Class B license and will probably use the call WAPI.

#### **NEWS BRIEFS FROM** THE BROADCASTERS

11

WOR, NEWARK, OBSERVES THIRD ANNIVERSARY

KOA, Denver, Players to Act Monday. WHAD, Milwaukee, Adds Open-Air Band Concerts

WOR, L. Bamberger's station at Newark, N. J., recently celebrated its third birthday with a special program arranged by Joseph M. Barnett, director and chief announcer. A number of famous names were heard announced, including Dr. Frank H. Vizetelly, famous lexicographer, and Houdin, noted psychic investigator and "Handeuff King."

Dramatic night, Monday, August 3, at KOA, Denver General Electric station, will be observed with a sketch from "Madame. Butterfly," and a one-act fantasy, "The Maker of Dreams." The KOA Players, under the direction of Iris Ruth Favey, will give the performances.

The municipal open-air band concerts, which have been a feature of Milwaukee summer recreation for a good many years are having a still wider audience this summer. Arrangements have been made by WHAD, Marquette University-Milwaukee Journal station, to broadcast two of these concerts each week. Sunday at 3:15 p. m. and Wednesday at 8 p. m., Central time, the concerts are scheduled.

Joseph Plunketts Plunketteers of the Mark Strand theater, New York, are just one year old as a broadcasting unit, but now known to the hundreds of thousands of fans throughout the East.

As a means of educating the public in traffic laws, particularly as applied to the operation of motor cars, WGY, the Schenectady station of the General Electric company, recently gave "A Night in Magistrate's Court," a three-act tragedy with a moral in every act.

#### BAND CONCERTS PROVE POPULAR

WEAF Goldman Musicians Take Even in Crowded Summer Ether Schedules

NEW YORK.—"Such popularity must be deserved" is a slogan that could well be applied to the Goldman band concerts heard countrywide through WEAF and eight other stations three nights each week.

Starting to broadcast at a time of year when band concerts were literally a nightly occurrence on the air, and when the market was seemingly glutted with this type of music, Mr. Goldman overnight became one of the most popular of WEAF features. Within two weeks, over 5,000 letters have been received and they are now pouring in at the rate of about 750 a day.

Several factors can be held accountable for this response—the summer Radio au-

for this response—the summer Radio andience seems to want music, not necessarily light, but at any rate, familiar. Mr. Goldman arranges exceptionally well rounded programs, usually opening with well-known "heavy" numbers, then grad-ually lightening up as the evening ad-

On Sunday, August 2, WEAF, WEEI, WJAR, WCAP, WCTS, WWJ, WCAE and WFI will be linked for the concert starting at 9:15 p. m., Bastern daylight saving time. A Bohemian program will be broadcast on Monday, August 3, starting at 8:45 p. m., from WEAF, WOO and WWJ.

King of Sweden Decorates General Electric Engineer

General Electric Engineer NEW YORK.—E. F. W. Alexanderson, consulting engineer of the General Electric company whose invention of the Alexanderson high frequency alternator first made trans-oceanic Radio communication practical, was decorated by King Gustav V of Sweden recently with the Order of the North Star, the highest decoration within the power of the king to scientific or distinguished persons.

icense Evaders' Army Swells

License Evaders' Army Swells
LONDON.—The number of unlicensed listeners here has reached an alarming figure. It is considered that there are at least 1,250,000 who have not paid the license fee. Some months ago the figure was computed at 150,000; then it crept to 250,000, and a month later 500,000.

The figure has grown to one and one-fourth millions since the Radio bill, which imposed the right of search and other penalties, was abandoned by the present Farliament.

#### RADIO IN HOSPITALS FOR LONDON PUBLIC

ONDON.—"A Radio set for every bed in every public hospital in London," is the benevolent and ambitious aim of the Radio hospitals ambitious aim of the Radio hospitals fund which has been organized here. Already the fund has collected \$70,000 in money and equipment. Three large hospitals are about completely equipped, those containing the greatest number of beds being given first preference. Some 4,000 beds in twelve different hospitals will be equipped. It is probable that special programs will be broadcast by the British Broadcasting company.

#### SCOTCH COUPLE IS WED BY FREE MUSIC

EW YORK.—Hardly a day goes by that one or two requests, either by telephone or letter, are not received by WEAF, New York, for Lohengrin's "Wedding March." If these requests were compiled with this famous march would become most abused. However, an exception was made recently when Joseph Knecht's orchestra furnished the march for a wedding ceremony in a distant town where Radio music was the only kind available. The bride and bridegroom, by the way, had just come from Scotland.

### PLAYS SWEET HAWAIIAN STRAINS



When Henryetta Turner, the ukulele girl, plays and sings sweet Hawaiian melodies from WEHJ, New York, all the boys want to start westward to the land of liquid sunshine, but when they see this picture they will hop the Broadway Limited.

#### Crosley Yacht to Give Music to Great Lakes

'Muroma" Will Be Equipped with First Two-Way Private Line in Broadcaster Great Britain

DETROIT. -Summer campers and cot

DETROIT.—Summer campers and cottagers along the Great Lakes and especially in the Georgian Bay region, will soon be provided with Radio programs broadcast from the Muroma, Powel Crosley, Jr.'s 65-foot motor yacht.

Special broadcasting equipment is to be installed aboard the yacht before she leaves the Detroit Yacht club with her owner and guests for a vacation trip. The call letters will probably be WLW, Jr., which will serve to identify the floating station with that of the Crosley superpower Station WLW in Clincinnati.

Invitations will be extended to campers to participate in the programs to be broadcast when the yacht makes port for the night.

#### Welsh Miners Talk Over Private Radio

LONDON, Eng.-What is believed to be LONDON, Eng.—What is believed to be the first private two-way Radio telephone installation in Great Britain is now being operated by the Powell Duffryn Steam Coal company, between its collieries at Llantrisant and Bargoed, Wales, over a distance of 35 miles.

Each station has an apparatus for both recention, and travenies on and the con-

eception and transmission, and the com pany proposes to link up another colliery at Aberaman, so successful has the in-stallation proved. For special purposes it has been found much superior to the ordinary telephone.

New Swiss Station Looms
BASEL, Switzerland.— Broadcasting
equipment has been installed at the new
station here. The principal wave lengths
to be used will be 300 and 1,300 meters.
There are now four broadcasting sta-

tions in Switzerland, the other three being located at Zurich, Geneva and Lau-

#### **KENTUCKY HOME' IS** GIFT IF WHAS ERRS

LOUISVILLE PLANT IS OUT TO MAKE SLOGAN GOOD

Catch Them Quiet 8 Seconds During Program and Receive Foster Song Book

Song Book

LOUISVILLE—Still determining to live up to their slogan, "The Snappiest Radio Station in the World," WHAS here has renewed the offer, "Catch us silent for eight minutes and win a prize," made on their birthday night, for the next 365 7:30 to 9:30 evening concerts.

Very distinctive of Louisville and the Blue Grass state is the prize offered to the Radio world. It is a copy of Stephen C. Foster's Ten Best Songs, arranged especially for vocal quartet and dedicated to Station WHAS by Zudie Harris Reinecke, with Foster's "My Old Kentucky Home" occupying a prominent position in the volume.

A musical péper reviewing these particular arrangements said: "This is the most valuable service ever done to Stephen C. Foster. The arrangements breathe the very sprit of the South and they are never overdone, as too frequently happens. Their outstanding charm is the exceptional intelligence with which they are handled."

\*\*Work to Get Book\*\*

Everyone can got a copy of this book

exceptional intelligence with which they are handled."

How to Get Book

Everyone can got a copy of this book by catching WHAS silent for as long as eight seconds during any of their next 365 evening concerts, except when such silences are due to local thunderstorms, tube blow-outs, or other unavoidable mechanical breaks. In so much as this station has lost less than sixty minutes from these causes during the last 400 hours of evening broadcasting, they do not anticipate much similar trouble in the future.

All letters claiming a WHAS song book on the above conditions must contain five cents in stamps for mailing charges and also be confirmed by another signature; the exact date, hour, and other helpful information being carefully noted.

#### OPERA OF 2 KINDS ON EVENING BILL

WEAF to Broadcast Both Heavy and Light Musical Plays Same Night

Same Night

NEW YORK—Opera in its two forms, the stirring tragedies of the grand opera and the light operetta of the contemporary theater, will be heard on the WEAF wave length Tuesday, August 11, at 10 p.

"La Gloconda," Ponchiell's adaptation of Victor Rugo's drama, "Angelo," will be sung by the WEAF Grand Opera company under the direction of Ceasre Sodero for the audiences of that station, WEEI, WFI, WCAE, WGR and WWJ. "La Gloconda" is a product of those happy days when the untamed music lover was considered, but at the same time, full of charm for the experienced musicians, has plenty of melodies generously embellished with interesting harmonies and with colorful orchestrations. "The Dance of the Hours" is today one of the most popular of orchestral selections.

The WEAF Light Opera company returns to the microphone of the New York station Saturday, August 1, when it will broadcast at 7 p. m. and later at 8 p. m. a program of music of the type which its name indicates. Marie Opfinger, soprano; Joy Sweet, contraity, James Haupt, tenor, and Chester Moffat, bass, comprise the four members of this popular group.

WBAP Erects New Aerial;

Silent During Building
FORT WORTH, Toxas,—Plans for the
erection of a new antenna system have
just been completed by WBAP, The StarTelegram Radio station, and construction
work has started.

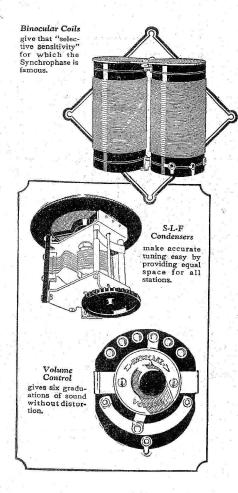
work has started.

The new antenna will reach a height of over 300 feet when it is swung between the two towers and will be visible for a distance of several miles.

Programs will be suspended during this work.

Constantinople Hears U. S.

WASHINGTON, D. C.—Operating on a
wave length of 80 meters, an experimental
short wave set at the Naval air station,
Lakehurst, N. J., has been heard in Constantinople, a distance of over 5,800 miles,
according to word recently received in
the navy department from the U. S. S.
Scorpion of the U. S. naval forces in the
Mediterranean. The Scorpion reported that
the signals were so strong as to be heard the signals were so strong as to be heard with the detector below oscillation.



# The Keynote of Radio Enjoyment

lies in the ability of your set to select any desired station and cut out all the rest; to vary the volume to please your ear without in any way distorting the sound; to give you distance without any disturbance from local stations; to permit accurate tuning easily and speedily.

Three exclusive features of the Synchrophase—Binocular Coils, S-L-F (Straight Line Frequency) Condensers and Volume Control—enable you to obtain all these essentials of radio enjoyment.

Ask your dealer to demonstrate; then compare

A. H. GREBE & CO., Inc., Van Wyck Blvd., Richmond Hill, N.Y. New York Office: Steinway Hall, 109 West 57th Street Western Branch: 443 So. San Pedro Street, Los Angeles, Cal.



This company owns and operates stations WAHG and WBOQ; also mobile and marine low-wave rebroadcasting stations.

# TRADE MARK Reg. U. S. Pat. Off.



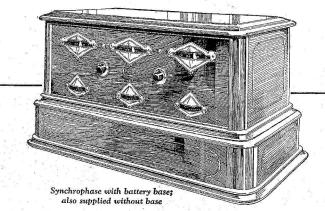
"If you would obtain virtue you must first serve your neighbor." —KWANG TZU

The pleasure given by the Synchrophase is a reward for years of labor.





All Grebe apparatus is covered by patents granted and pending.



# WTAM, "The Voice from the Storage Battery"



"IT HE Voice from the Storage Battery!" It is a fitting slogan that the Willard Storage Battery company, of Cleveland, Ohio, has chosen and it has been heard across the Atlantic, from coast to coast in the United States and Canada, in Central America and far north amid the snow and ice of the arctic regions.

in the way of the control of the con

artists all. As director of the Coo Coo club orchestra it behooves Mr. Jones that his ensemble and its offerings live up to a name that implies a total absence of sanity. That this is accomplished in effect but without a real loss of sanity or disregard for conventions is an achievement of no light order and is a tribute to "Ev's" real ability as a director.

Carl Rupp and his Hotel Hollenden orchestra provide dance music for the station as a weekly program feature and Mrs. Carl Rupp often delights the audience with vocal numbers. Mr. Rupp is the composer of many songs which have achieved national popularity, among them being "Lovely Lady," of which Mrs. Rupp was the inspiration. On other evenings an organ recital is offered, featuring the immense municipal organ in Cleveland's public auditorium. Mr. Edwin Arthur Kraft presides at the console most frequently, though Mr. Metcalf is called upon very often. Both gentlemen are organists of exceptional ability, Mr. Metcalf is blind, but his loss of vision seems compensated for by a marvelous sense of touch and appreciation of harmonies and he delights in exhibiting the capacities of the organ.

From six to seven o'clock, every evening except Sunday, WTAM offers a dinner concert of unusual



#### COPPER-GLASS SEAL EARNS \$1,000 AWARD

W. G. HOUSKEEPER WINS JOHN SCOTT MEDAL

Perfects Method of Adhering Copper to Glass in Airtight Union for Tube Use

Tube Use

PHILADELPHIA.—The city of Philadelphia has awarded to William G. Houskeeper of South Orange, N. J., the John Scott medal for his contribution of a copper-glass seal to technical progress. The award carries with it a premium of \$4,000 and is made by the city of Philadelphia from the proceeds of a fund left more than one hundred years ago by John Scott of Edinburgh, Scotland.

The achievement for which the medal was awarded to Mr. Houskeeper is the development in the Bell Telephone laboratories in New York, of a practical method for making an airtight joint between copper and glass. Such a seal has been sought ever since the invention of the electric lamp more than a generation ago, requiring that an electric current be carried into the inside of an exhausted glass bulb. Recent developments in high power Radio transmission have required the carrying of even larger currents into vacuum tubes, and in other ways indicated the necessity for a copper-to-glass seal.

Copper Replaces Costly Flatinum

Copper Replaces Costly Platinum

Copper Replaces Costly Platinum
It has been known for a long time that
these two substances when heated and
pressed together will adhere much as
taffy will stick to a plate. The fact that
on cooling the copper contracted more
rapidly than the glass invariably caused
the joint to break and allowed air to leak
in and destroy the vacuum.
Since platinum contracts at practically
the same rate as glass it has been extensively used. Its cost, however, is prohibitive in large amounts. Mr. Houskeeper's invention makes it entirely practicable to use copper instead of platinum,
thus making the large sized vacuum tubes
commercially possible. Many of these
tubes are in use in the high powered
broadcasting stations.

How Copper-to-Glass Seal Works

tubes are in use in the high powered broadcasting stations.

\*\*Mow Copper-to-Glass Seal Works\*\*

Mr. Houskeeper's invention briefly consists in the discovery that a copper-glass seal fails by the shrinkage of the copper away from the glass, and that this sl-inkage can be prevented if either of two substances is thin enough in comparison with the other that it can be stretched or compressed by its heavier team-mate. Due to its greater ductivity, the copper is usually selected as the element to give.

In joining a copper tube to one of glass the end of the copper is worked to a thin fin only a few thousandths of an inch thick. This is rubbed into contact with a heated glass ring, and later a larger piece of glass is sealed to the ring to complete the upper part of one of the high power vacuum tubes.

The wires are brought into this tube in an equally ingenious manner. To each wire is welded a thin copper disc which is then rubbed into contact with the flared end of a shoth glass tube. The other end of the tube is then welded by an ordinary glass-to-glass joint to the upper part of the vacuum tube.

#### BILL HAY IS GUEST AT WLS RECEPTION



CHICAGO.—"Bill"
(W. G.) Hay, who
for two years has
been one of the announc-

#### HIGH POWER TUBES USE HIS INVENTION



William G. Houskeeper, South Orange, N. J., inventor, has perfected a method for making an airtight seal between copper and glass, for which he recently was awarded the John Scott medal and premium of \$1,000. Note the high power vacuum tube he is holding. All of the high power tubes make use of his invention where the wires or water cooling plate enter the evacuated glass container.

#### WTAM AT CLEVELAND

(Continued from page 5)

These popular dinner concerts are varied often by Guy Lombardo and his Royal Canadians, whose offerings are of lighter nature, but are thoroughly enjoyable.

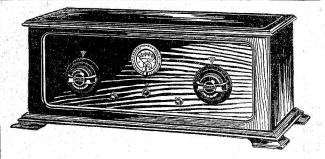
Another orchestra that plays a prominent part in the entertainment of WTAM's addience is that of Austin J. Wylie. Mr. Wylie is probably the most unassuming orchestra leader that can be found; modest almost to the point of diffidence. Wylie's orchestra was selected to entertain at one of Cleveland's most pretentious cafe dansants—it has been called upon for phonograph records time and time again. Mr. Wylie often announces his own programs, using a portable remote control equipment.

Since the opening of the summer season, Frank Wilson's Euclid Beach orchestra has been heard. Whether due to exceptionally favorable acoustic properties of the big dancing pavilion or to particular excellence of the orchestra itself, the offerings from this remote control station have attracted unusual attention from the station's audience.

A particularly pleasing feature of WTAM's daily schedule is the noonday program broadcast from the Euclid Music company studio, where Miss Ruth King is both announcer and program director. Miss King has been called "The Belasco of Radio;" certain it is that the young lady has remarkable ability in arranging and presenting an entertaining program. An accomplished musician and a composer of delightful little songs, Miss King has a most discriminating sense of values and her programs are noted for their "balance," that subtle something that preserves the proper relation between vocal and siturumental numbers, seriousness and syncopation.

A monthly feature of Station WTAM is "The Nite Caps," for he has stood sponsor for the unique features that have made these programs distinctive since their inception, These programs are proadcast from the Euclid Music company studio and Miss Ruth King arranges and directs the offerings.

It would be a pleasure to introduce all of the artists who contribute to the programs offered by WTAM, but it is also a man



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#### **SUGGESTS RADIO TO** OVERCOME DEFICIT

OPERA LOSS LARGER WITH BROADCASTING OUT

Zenith Official Writes Chicago Opera Head: Explains How Radio Will Help Songsters

Head: Explains How Radio
Will Help Songsters

CHICAGO.—When the final financial statement of the Chicago Civic Opera company was issued for the season 1924-25 it was found that the always present deficit was greater this year than it was for 1923-24. Many reasons have been advanced as to the why of the added loss and many plans advanced for avoiding the same next season.

However, of all suggestions forwarded to Samuel Insult, the financial head of the organization, the one coming from S. I. Marks, business manager of the Zenith Radio corporation, is of greatest interest to the Radio public and perhaps to the lowers of opera.

Figures show that in 1923 when opera was broadcast from Chicago through Stations KYW and WMAQ, the deficit was much lower than it was in 1924 when the broadcasters were refused the privilege of opening their microphones in the Auditorium theater to pick up the operas.

Radio Leader Points Reasons

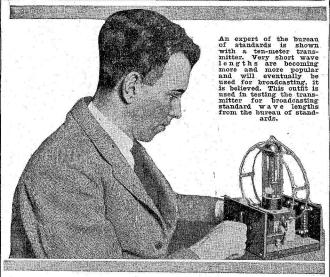
Mr. Marks, in his letter to Mr. Insull, points out this fact and gives additional reasons why he believes that the logical solution of the deficit lowering problem is in the use of the Radio to increase a public appetite for classic music. The opera director's reply is awaited with great interest by those who love to sample opera in their homes before and after hearing it in full in the theater.

A part of Mr. Marks' letter follows:

"What persons other than those musically inclined could truly say that they liked classical music? Those who attend the opera in the majority, acquired their so-called forced occasions."

"In order to attract a great attendance at operatic performances, the general pub-

#### TEN-METER TEST OUTFIT AT WORK



is in the use of the Radio to increase a public appetite for classic music. The opera director's reply is awaited with great interest by those wholeve to sample opera in their homes before and after hearing it in full in the theater.

A part of Mr. Manks' letter follows:

"What ersons ofter than those musically inclined could truy say that they liked classed music? Those who attend the opera in the majority, acquired their taste for it by constantly hearing it, under so-called forced occasions.

"In order to attract a great attendance at operatic performances, the general pub
"Preacher of Million Listeners' Is Title of World Radio Church Pastor

He Visualizes Invisible Congregation That Supplies Him with Auto, Radio, Candy, Eggs, Meat and Cakes—WOAW Pastor

Hes Direct Appeal to Listeners

By Engene Konecky

"This is Radio Station WOAW, the Woodmen of the World, at Omaha, Nebr."

But statistics are cold blooded affairs, after all. There is more eloquent testi-

The bishop of London, in a recent prayer, called to God for a benedition of the modern inventions, among them particularly the motion picture and Radio.

#### Village Store Now Air Fans Hangout

Old Stove No Longer Center of At-traction at Cross Roads—Radio Holds Attention

Traction at Cross Roads—Radio
Holds Attention

Supplanting the old stove in many a country store today is to be found the Radio loud speaker. Men gathered around the stove a generation ago and talked, now around the loud speaker they listen. At the little town of Acton, on the edge of the Mojave desert, the store-keeper has provided a Radio receiver for his customers. Every evening they flock in to hear Radio programs, according to L. A. Barrett, of the Forestry service, in a recent interview with a member of the staff of KGO, the General Electric Pacific coast broadcaster.

Teaches English to Section Foreman
"One of the frequenters to this store is a Swede, a section foreman on the railroad. He is a man of middle age, who has been in this country a long time, but has not yet mastered the English language to his satisfaction. Every evening you will find him at the store in Acton, listening to English lessons from KGO, broadcast by Wilda Wilson Church. "Besides being a medium of education and entertainment for the dweller in mountains and deserts of the West, Radio is also helping in other ways. During summer months constant forest fire menace is uppermost in minds of stock raisers and lumbermen. Radio, by spreading widely important information on fire prevention is of enormous benefit," according to Barrett. "One of our most difficult problems is to educate tourists. Not that the tourist is more carcless where fire is concerned, but because he is many times not used to living in a country where grass under his feet is tinder, and where a single cigarette stub or piece of glass is enough to start a million dollar blaze.

Entertains Forest Rangers
"In the feet is tunder, and where a single cigarette stub or piece of glass is enough to start a million dollar blaze.

of glass is enough to start a million dollar blaze.

\*\*The the course of my rounds visiting
fire wardens and rangers in the forest reserves, I am constantly seeing the value
of Radio in keeping these men on lonely
outposts in touch with the world. Not
only do rangers and fire scouts enjoy Radio programs, but lumber-jacks and workers at the saw mills are equally enthusiastic. No modern lumber camp is without its Radio receiver. Up in Trinity
river country of northern California, I
have seen groups of men listening in night
after night.
Radio also often brings valuable information to fire outposts. One night, up in
Lassen county, I got news of fires and
progress made against them from all up
and down the coast. Nothing before Radio has ever been able to bring in such
comprehensive reports."

Many persons so deaf that they cannot

By Eugene Koncely

The announcer is speaking: "This is Radio Station WOAW, the Woodmen of the World, at Omaha, Nebr. You are listening to the religious services of our World Radio congregation, of which Reverend R. R. Brown is pastor. Reverend Brown will now present his sermon."

No jazz; no sensationalism—a spontaneous, sincer religious thought in modern understandable terms that carry conviction. He says: "You boys in the garage there, take off your hats; say, Bill throw away that smoke." Back comes a telegram, "How'd you know? We're with you."

the title, "the preacher with a million listeners."
But statistics are cold blooded affairs, after all. There is more eloquent testi-mony than documents, words or num-bers.

after all. There is more enoquent costmony than documents, words or numbers.

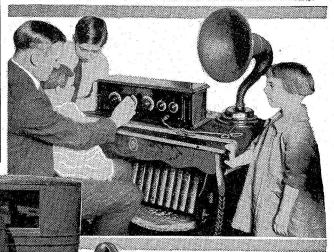
Country eggs by the dozens, honey,
bulging hams, turkeys, candy, cakes of
the best homemade variety, pictures,
brooms, and numerous other articles, are
included in the list.

Recently two exceptional gifts were presented to Reverend Brown by his Radio
admirers. The important fact, in this connection, is that these gifts, one and all,
including the last two mentioned, have
been made to Brown without any public
solicitation whatever.

F. A. Holmes is a Radio manufacturer.
But he has for more than two years been
interested in Reverend Brown's splendid
services. Mr. Holmes, who lives in Waterloo, Jowa, was deeply stirred to express
his feeling of gratitude to Reverend
Brown. One time, on a visit to Omaha, he
called at the pastor's home and met his
family. Here was the whole world listening to Brown except his own family. And
how, Brown's Sunday morning services
"hit home," in the literal sense of the retiegram, "How'd you know? We're with you."

Reverend Brown knows his audience, the youngsters and grown-ups, the tradesmen, mechanics, editors, doctors and shuttins. He knows that his message must be simple, direct, emotionally sympathetic. He says: "I see 'em all, in the stel-framed, glass circles of my microphone."

And the next question is, does Brown "get across" with his message. That question could be answered by reciting some statistics, for instance, that more than 50,000 listeners have certificates of membership in the World Radio congregation, and that this congregation has won him in the literal sense of the



Just because Rev. R. R. Brown was so much delayed in visiting a neighboring community to deliver a serion his made of listeners of the WOAW andience "graded the lat" on the quiet and purchased this splendid new automobile to substitute for his battered fliver. The best part of it all was that he didn't know a thing about the project and was completely surprised when the presentation was made. While preaching isn't often the most profitable of professions, Reverend Brown is well taken care of by his good friends who listen to him over WOAW. Above he is shown with his three youngsters while tuning the five-tube set given to him by a receiving set maker who is a regular member of Reverend Brown's ether church.

# RAY BAILEY'S TRIO PLAYS AT KFWB

#### Saturday, August 1

Sturray silent night for: CMRT, KFAE, KFDM, KFMG, KFUO, KFWA, KLOS, KLJ, KGA, WBAY, WBAY, WBAY, WBAY, WBAY, WBAY, WBAY, WBAY, WBAY, WHA, WHAY, WHAY, WHAY, WHAY, WHAY, WHAY, WHAY, WHAY, WHAY, WBAY, WBYJI, WTIO, WWI, WII, WWAK, WOAN, WOO, WSUI, WTIO, WWI,

Atlantic or Eastern Daylight Saving

Atlantic or Lastern Daylight Saying

Time Stations

ENRO, Ottawa, Can. (455), 8 p. m., Chateau Laurie
concert ordestra; Mrs. George Rogers, pianist; Ro,
Carson, bartione; Gordon Rogers, reader; harmonies
refections, W. A. Mossey, I. W. McMaster, K. Young,
Pipe Major Sullivan, bagples; Chateau Laurier dame
orchestra.

concert orchestra; Mrs. George stogers, punnus; and Curson, bartiones, Octorion Rogress, reader; harmonical B. Gratham, R. Gauthler; Mrs. J. H. Irvin, sportan; B. Gratham, R. Gauthler; Mrs. J. H. Irvin, sportan; Pipe Major Sullivan, Bapiphes; Chateau Laurier dance WBBR, New York, N. Y. (272.6), 8 p. m., Dr. Hans Haag, violinist; 8:10, Fred Twareseth, tenue; 8:15. Bible questions and answers, Judge Rutherford; 8:45. Bible questions and answers, Judge Rutherford; 8:46. Bible questions and answers, Judge Rutherford; 8:16. Bible questions and answers, Judge Ru

dimier concert. Book-cadillae note; S, die Leelan Symphony erchestra. William er concert. Milliam er conce

LeMarr; 11, Marion McKay's Bond Hill house orchestra.

\*\*WLS, Chicago, III. (344.6), 7:45 p. m., Iuliaby time;
\$8-1 a. m., national barn dance program; Tony Corcenan, Irish baritone; Walter Peterson, Kentucky
tric; Grace Wilson, contenting; Francisco, Fr

Headliners of the Week

AY BAILEY'S trio is an important feature of every motion picture taken by the Warner Brothers. Ray Bailey and his little portable organ, Scotty Denton and his three quarters cello and the violinist are always to be found just out range of the camera inspiring closeups or mob scenes indiscriminately. Tune in Saturday for KFWB and see if the trio inspires you.

Sunday, a new link up of stations

Sunday, a new link up of stations will be heard from with a surprise program. WIP has arranged this feature and will see that it is broadest through WPG, Atlantic City; WGBS, New York; and WMAF, Dartmouth mouth.

mouth.

Caruso will be honored by KDKA, Monday evening, August 3, when Harry Brunswick Loeb, the poet of New Orleans, will read his peem, "Tony's Letter," accompanied by the Symphony players. The poem describes the emotions of "Tony" upon hearing the famous tenor. Popular selections of twenty years ago will be revived this same evening at WAHG. Another important feature of the evening will be the appearance of Edward H. Smith, formerly dramatic director of the famous WGY players at WHAZ, Troy. Mr. Smith needs no introduction.

WTIC is still helping the eastern fan choose an attractive vacation. Tuesday, Henry Avery will talk on

"Canoeing in Central and Northern Maine." If you wish to follow the quiet trails of the Redskin, this talk will be well worth while. The Colt Park Municipal orchestra completes the evening's entertainment at this station. station.

the evening's entertainment at this station.

An attractive program is scheduled Wednesday for WLS, called "A Night on a Plantation." The Rousseau male quartet, the Solemn Old Judge, and the banjo players will make this an appropriate program for a moonlift summer night. WHA signs off for the rest of the summer, Wednesday, with a musical program contributed by the summer session school of music.

WFAA announces a farmers' frolic Thursday. J. M. Dickey, a well known Texas entertainer, will sing. Count. Ignace Rubinoffsky whose very title sounds mysterious and interesting will play the piano.

Women versus men will be the order of the evening, Friday at KOA, Denver. Part one of the program will be given entirely by the ladies with Iris Ruth Pavey announcing. Part two, will be given by the men. Talks on evolution are popular at the present time. Dr. Ernest A. Hooton of Harvard university will interprete this interesting theory this same evening at WEZ. Dr. Hooton is an authority on this subject. Here is a chance to get some first hand information.

WMAQ, Chicago, Ill. (447.5), 2:45 p. m. Chicago-Hrooklyn baselicil game; 6, to be annumed; 6:30, Jack Chapman's ordestra; 8, Fred Daw, Russell Pratt; 8:20, Taddo photologu. "The Twaxa Border," 1974. A second of the control of the c

Ginckle orchestra; Action Phil Wilexx Phil Wilexx Central Standard Time Stations KFAB, Lincoln, Nebr. (340.8), 6-7 p. m., dinner con-

FABL Linealn, Nebr. (306.6), 6-7; D. m., dimer concert, Nebr. (306.6), 6-7; D. m., dimer concert, Nebr. (306.6), 6-7; D. m., Dora P. (KFNF, Shenandeah, Iswa (266), 7:30 p. m., Dora P. (KFNF, Shenandeah, Iswa (266), 7:30 p. m., Dadiocate review, Jonnale Fielding; 10, dance music, comedy night, Jack, Jun. 70m. (310), Gibbs. Henry Miller, K. (200), S. (200)

WOAI, San Antonio, Texas (394.5), 8:30 p. m., Menger hotel trio.

WOAW, Omaha, Nebr. (326), 6 p. m., Rialto orchestra; 7. Giber: Jaffy, and his orchestra; 7:30, speaker; 7

KGW. Pertiand, Ore. (491.5), 6-3 n. m., Sachtersenergy or orienters; 10-12, dame muite, Jackie Souders' or orienters; 10-12, dame muite, Jackie Souders' or orienters; 10-12, dame muite, Jackie Souders' or orienters, 10-12, dame lader; 46-930, Art Hickman's Hiltmore hotel common lader; 46-930, Art Hickman's Hiltmore hotel common lader; 46-930, Art Hickman's Hiltmore hotel common lader; Jack Gregory Struth Ridens Piris, green juvenile; Jack Gregory Struth Ridens Piris, green juvenile; Jack Gregory Struth, 10-12, dame lader or orienters, 10-12, dame lader orienters, 10-12, dame lader; 10-12, dame lader orienters, 10-12, dame lader; 10-12, dame lader; 10-12, dame lader orienters, 10-12, dame lader o

KPO, San Francisco, Calif. (428.3), 8-12 p. m., Johnny Buick's Cabirlans

Atlantic or Eastern Daylight Saving

Atlantic or Eastern Daylight Carlos
Time Stations

CFCA, Toronto, Can. (356), 11 a.m., Bloor Street
Baptist church; 7 p. m., service, Timothy Eaton 

WHN, New Yerk, N. Y. (361:2), 5-5:30 p. m., Rossland dance ordestra; 10:45-11:15, Janssen's Hofbrau order orders and the control of the contr

Eastern Standard or Central Daylight Saving Time Stations

Saving Time Stations

KDKA, Pittsburgh, Pa. (399.1), 9:15 a. m., services, Calvary Enjeaval church; 5:30, baseball; 7:15, municipal church; 5:30, baseball; 7:15, municipal church; 7:40, pm., studio cneert.

KYW. Chicago. III. (355.4), 11-22 a. m., Second Presbyterian church; 3-4 p. m., studio cneert.

WBBM, Chicago. III. (325.4), 1-12, a. m., Second Presbyterian church; 3-4 p. m., studio cneert.

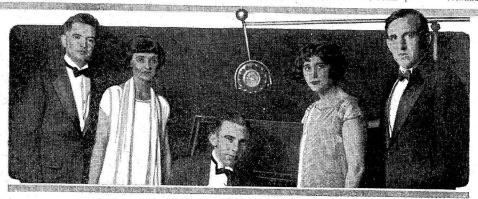
WBBM, Chicago. III. (225.), 3-6 p. m., tea dance pragram; Bill Kholan's WiFally orrhestris; 10:10, Sameyar orrhestris; Shipport Levine, William and Caldedia carried and control of the control

De la contraction de la contra

from WJS; 7:45, Lakewood tarm ensemble, WAG; 1s, Golffrey Ludlow, violinist, WJS.
Wadder serfield, III. (392.3), 8:45-9:45 a. m., Catholic services; 10:15-11:30, Protestant services; 12; constitution of the constitution of the

(Continued on page 9)

The Etherical quartet entertains of the Erui. They have revived many old English ballads and sing them with so much spiritener continuagine himself back in old England.



The members of this quartet are, from left to right, Fred L. Yates, tenor; Mrs. Mascho, soprano; H. Paul Craker, pianist; Mrs. Claude L. Freeland, alto, and W. Harry Clarke, bass.

# WEDNESDAY WLS PLANTATION NIGHT

#### Sunday, August 2

(Continued from page 8)

D. m., I. B. S. A. chord singers; T. Elias Freeman, septime; Alice Welcar, accompanist; 7:30, Bible leaving; R. F. Hollister.
(21, Chicago, III. (147.5), S-10 p. m., Rainbo Gardens orchestric Alvina Recke, soprano; Hinshaw conservations of the second sec

Selles, Collision Chief Delts reaser; American WEGO, Landson, Mich. (25.55), 10.8. m., Bolfry Plymouth Controlled Methods, 10:200. First Baptist church, Rev. Rajbi W. Hobbs, pastor; Mrs. Henry WSAI, Cincinnati, chief (226), 2 n. m., Radio sermon-cit, Radio Bible Service, Inc.; 3:18, Radio chimes, Robert Badgley. [1, 302.20], 3-12 mid-nich. Purple Gradient Controlled Methods of the Controlled Methods of th

Central Standard Time Stations
Central Standard Time Stations
KFAB, Lincoln, Nebr. (36.06), 1-5 p. m., German Evanscilcal church, Rev. R. Kuelme.
KFOM, Beamont. Texas (315.5), 8-9 p. m., sacred
FFOM, Beamont. Texas (315.5), 8-9 p. m., sacred
FFOM, Shenandenl, Iowa (256), 10-15 a. m., First
M. D. church; 2:30 p. m., Rev. and Mrs. C. S.
Hanley, S. religious servines: 4-one.

KFMF Sheanadesh, lown (266), 10:45 a. m., Pirst M. E. butteri, 2:30 p. m., Rev. and Mrs. C. S. Hanley; a. selfate property of the selfate property of



10:15 concert, Cenrtal Park; 10:15-10:30, "Trend of the Times," Dr. Sydney N. Ussher.
W00, Philadelphia, Pa. (368.2), 7:39 p. m., A. Carrellon, C. Carrellon

Bill Wather; 9-10, Al Reid's hour.

Eastern Standard or Central Daylight

Saving Time Stations

KDKA, Pittsburgh, Pa. (399.1), 8-15 p. m., concert.

WBBM, Chicago, Ill. (220, 6-7 p. m., vesper hour.

WBBM, Chicago, Ill. (220, 6-7 p. m., vesper hour.

WBZ, Springdeld, Mass. (333.1), 6 p. m., Capitol heater orchestra; Marguert Tiphe, organist; 6:32, Capitol theater orchestra; S. Aleppo Drum corps; 8:30, Harry Cuminies, harmonics solicits; 3-45, Stanley, G. Stanley, G. S. Stanley, G. Stanley, G. S. Stanley, G. Stanley, G. S. Stanley, G. Sta

Grackle orchestra.

OXA. Defroit, Mish. (616.9), 4:15 p. m., concert; 6, Symblery orchestra.

Symblery orchestra.

WEAR, Cleviand, Ohiot (289.4), 7:8 p. m., Vincent H., Verger, orcanist.

WEAR, Cleviand, Ohiot (289.4), 7:8 p. m., Vincent H., Verger, orcanist.



Petrinella Trimbur (left) plays the Wurlitzer Unit organ Tuesdays at 12:15 p. m. from WLW, Cincinnati. Eernie Schultz is the well-known conductor and violinist directing the famous Crescent orchestra at WOC, Davenport. Alberta McAdams Stone is one of the beautiful coeds whose voice may be heard from KFMQ, Fayetteville.

KGW, Portland, Ore, (491.5), 10:25-12 noon, services, Plute Presbyterian church, Dr. Howard Bowman, pastor; 135-9 p. in, services, First Presbyterian church, KHJ, tes Angeles, Calif. (405.2), 6-3:30 p. in, Lettin Church, C

JR, Seattle, Wash. (384.4), 11 a. m., First Methodist Episcopal church; 7 p. m., First Methodist Episcopal church

KMX, Hallywood, Galif, Gals, 90, 78-D. m., First Pres-byterian church of Hollywood, Rev. Stewart P. Mc-Lernan, pastery 3-9, Ambasador hotel ennect orches-terian church of Manyasador hotel ennect orches-person of the control of the control of the control person of the control of the control of the con-plevery Hills Nurseries, Lukovijski tidnost program, Heventy Hills Nurseries, Lukovijski tidnost program, Heventy Hills Nurseries, Lukovijski tidnost open Heventy Hills Nurseries, Lukovijski tidnost open Heventy Hills Nurseries, Lukovijski tidnost Herosador of the control of the con-position of the control of the con-crete transies, Calif. (428.3) 1.12 m., under-position of the control of the con-crete transies, Calif. (428.3) 1.12 m., under-position of the control of the con-crete transies of the con-trol of the control of the con-trol of the con-

Monday, August 3

Atlantic or Eastern Daylight Saving Time Stations

GHIG. Trastic Saving Additions (CHIC) or Caster System (356.7), 8:30 p. m., CHIC or CHIC or Caster System (356.7), 8:30 p. m., CHIC or CHIC or Caster System (356.7), 8:30 p. m., CHIC or CHIC or CASTER (356.8), 7:30-11:30 p. m., vocal and instrumental selections pondar twenty or mare years ato, Borace J. Taylor, Thornton Fisher; Synchrophase tho; James M. Savil Davios later; Synchrophase tho; James M. Savil or Endow and Sterling male quarter.

WBBR. New York, N., C. (272.0), 8.2 m., Irans KichtWBBR. New York, N., C. (272.0), 8.2 m., Irans Kicht28:20, World News Direct; S:30, duller, solosis; 8:40, "The Harp of God," Bible instruction; 8:56, Irans Kichtpeter.

Kleinpeter. WCAE, Pittsburgh, Pa. (461.3), 6:30 p. m., dinner

were beard from KFMQ, Payetteville.

concert, William Penn hotel; 8:30, concert; 11, dance music, Sandrest im.

WEAF, New York, N. Y. (491.5), 4-5 p. m., musical program: "The Human Side of Music." Margaret Zeribe Cowl; 6-7, dinner music, Walderf-Astonia 7-8, program, Mark Strand theater, direction of Joseph Plunkett 8:30-8:35, health talk, Mctropolitan Life Imagence company; 8:36-91.51, Ghubman band concert; Plunkett 8:30-8:35, health talk, Mctropolitan Life Imagence company; 8:36-91.53, Ghubman band concert, Reference of the Strands of th

WJAR, Previdence, R. 1. (305.9), 7.48 p. m., Berry Springs dance hour.

WJZ, New York, N. Y. (454.3), 4.30-5.30 p. m., Fred Hall's Royal Terrace or resistar; 7-8, Bernhard Levisser of the State of the

Coal company; sparks by Lisgett's Red Hot Piano player; 11, organ realtal, Cyril Buschle; the Fannous WMAK, Leshepart, N. Y. (265.5), 8:30-10-125 p. m., musicale, Max Freedman. WMBF, Miani Beach, Fla. (384.4), 7-7:30 p. m., studio concert; 7:30-8, dance rausic, Fleetwood hotel orchest-tria; 10-12, Fleetwood hotel orchestra; 10-12, Fleetwood hotel orchest-

WORD, Batavia, 111. (278), 8:30 p. m., Bible questions and answers; 8:45, studio recital, Columbia Conserva-WSAI, Glicinnati, Ohio, 3236, 10 p. m., Helen Krahn, violinist; Prisellia Holbrock, planist; Irvin Confer, tenor.

tenor.
WTAM. Cleveland, Ohio (389.4), 6-7 p. m., Golden Pheasant orchestra; 8-9, Whilert symphony; 9-11, concert; 11-12. Enable Section Concerts (1-12. Enable Minta, Tomany Dumbay Tubby Garon, Maurine Marseilles, Art Stiller, Berger Wedberg.

Pheasant orchestra; 8-9, Williard symphony; 9-11.

Photoger; 11-12. Buclif bach orchestra, m., Purple Grackle orchestra; Hutbie Mintz, Tonny Dunlan, Tubby Garcelle orchestra; Hutbie Mintz, Tonny Dunlan, Tubby Garcelle, Gan, (348,6), 8, p. m., Emil Helmberger's Hutel Bond thip; Dunlan Massare, tenor; 6:55, dinner music, 6:5

(Continued on page 10)

KFUO. St. Louis, Me. (535.1), 8:15 p. m., "He Aveended—to Judie the Quick and the Dead."

KFVE. University City, Me. (230), 10 p. m., organ rectul, sacred and classical music, Wilber H. Mocker, Cities, and the Control of the Contro

rector.

WOAW. Omaha, Nebr. (526), 9 a. m., chapel services,
Rev. R. R. Brown; 9 p. m., chapel services, Methodist

Hev. R. R. Brown; 9 p. m., chapel services, Methodisk Briscopal chapter to was (483.6), 1.2 p. m., Palmer O. Davenport to was (483.6), 1.2 p. m., Palmer Paul J. Vipnorwan, tenor: 5445, 1.2 p. m., Palmer Paul J. Vipnorwan, tenor: 5445, 1.2 p. d., Palmer S. 3.0, services, Mothodist Episcopal church, Rev. D. C., Loose, pastor,

Mountain Standard Time Stations
KOA, Denver, Colo. (322.4), 11 a. m., Trinity Methodist Episcopal church; 4 p. m., Trinity Methodist Episcopal church music; 7:45, Trinity Methodists Episcopal church.

copal clurch.

Pacific Standard Time Stations

KFWB, Hellyweed, Calif. (252), 9-11 p. m., late sports
and world news followed by Warner Bros. morie frolic

Pursanthins several Warner Bros. stars. First Methcodist Ediscopal church; 2:50 p. m., Cliff hefel, concert; KGO, Little Symptomy orchestra; 7:30, First

Methodist Ediscopal church.

# FARMERS' FROLIC THURSDAY AT WFAA

#### Monday, August 3

(Continued from page 9)

(Continued from page 9)
WHO, Des Moines, Iaws (39), 7:30-9 n, m. Stowert
Watson, bartlone; Molen Birmingham, accommentary,
artists, Dean Holines Cooper, director; 11:12, "Corn
Sugar" orchestra.
WMC, Mamphis, Edin. (499.7), 7:30 p, m., farm talk,
WMC, Mamphis, Edin. (499.7), 7:30 p, m., farm
talk,
San Antonio, Tea. (394.5), 8:50 p, m., Mengre
WOAW, Omaha, Notr. (328), 5 p, m., Phyllis Griswold, organist; 5:30, McCorry's popular period; 6:45,
auspicse Hannan Van Brunt company, Ford dealers,
auspicse Hannan Van Brunt compa

Mountain Standard Time Stations WA. Ogden, Utah. (261), 9-11 p. m., Ensign Drug

WOGINGAM STANGARGA I BIME SECTIONS (FWA, Ogden, Utah. (261), 9-11 p. m., Ensitin Drus (KOA, Denwer, Cole., (322.4), 6:30 p. m., Hesbeet White, and his Silver State or-thestra; 7:308, Sandman's hour; 8. "The Twelve Pound Look," "The Maker of Dreams," cramatic statech. "Madame Butterfly, and the Silver Standard Time Stations. Fooler, cellist.

Pacific Standard Time Stations.

KFOA, Seattle, Wash. (454.3), 6:6:45 p. m., Olympic hotel concert orlesters, 6:45-8:15. Sherman, Clay and company program; 8:30-10, Times dance music, but a company program; 8:30-10, Times dance music, but a company program; 8:30-10, Times dance music, but a company program; 8:30-10, Times dance music, but and answer period on Radio subjects conducted by K. G. Ormiston, technical editor of Radio Doings; 8-9, program, Star Motor Car company of Calif., Dan Gridley, violinis; 1 pace Chudow, oneset planis; 19-10, Harodi's Collectans dance orchestra, Alma and Nick Brown, Salvino Baiano's stringed tric; 10-11, Warner Bros. Frolle, direction Caratic Wellman.



millian Mad-sen is director of McCrory's popular period broadcast from WOAW every Monday at 6:30 p. m. She is an ev-

KGO, Oakland, Calif. (361.2), 6.7 p. m., dinor correct William Company, 8.7 p. m., dinor correct William Company, 8.7 p. m., dinor correct William Institute Doubt-less Manual Company, 19. p. m., dinor correct Workstop, Opera, Arthur S. Garbett, Signett Anton tricking Automobile III, Loois F. KGW, Pertland, Dre. (491.5), 6.7 p. m., Claude Johnson and his Daker theater orthertry, 17.98 b, baseball

#### Tuesday, August 4

Tuesday, silent night for: CNRT. KFAE, KFUO, KFWA. KOA. PWX. WAHG, WBAV, WBBR, WCBD, WEAO, WHA, WKAQ, WLIT. WMAK, WTAM.

#### Atlantic or Eastern Daylight Saving Time Stations

WGAE, Pittsburch, Pa. (461.3), 6:30 n. m., dinner concert, William Penn hotel: 8, program from New York; 8:30, Gold Dust Twins; 9, Erceredy hour; 10. WGAU, Philadelphia, Pa. (270), 6:30 n. m., Billy Hayes and his Cathay Tea Garden dane orchestra; 7:30, N. Snollenburg and company concert; 10:30, Billy Edges and his Cathay Tea Garden dane orchestra.

Billy Hayes and his Cathay Tea Garden dance orchestra.

WDWF, Providence, R. I. (440.9), \$3.00 p. m., Arcardia orchestra.

WEAR VEW. (A), Y. (491.5), 4.5 p. m., Attreact

WEAR VEW. (541.5), 4.5 p. m., Attreact

Ort-Astoria, 7:10-7:39, leature, Calmbai university;

7:30-8. Tollefsen Instrumental tric; \$3.0-9, Gold Dust

Twins: 9-16, Ever-act, bury; 10-11, grand opera,

Twins: 9-16, Ever-act, bury; 10-11, grand opera,

WEEL, New York, N. Y. (272.6), 7:7:30 p. m., Dan

Barnett's orcicature; 7:30-8. Cocche-Stewakin band;

8:3-10, rallroad talk, G. T. Geer; \$1:5-8:30, Jean

Moresco accompanied by Norman Hemoletic, \$3:0-4,

WEEL, Baston, Mass. (475.9), 7:30 p. m., musicale;

7-35, Charle Donelan; 8, musicale; \$3.9, Gold Dust

Twins: 9, Ever-acy hour; 10, WEAF Grand Opera

Twins: 9, Evercaty 1001, 30, 615 p. m. Belleru w trafford Boar Garden orchestra; 8, Tellersen Instru-mental trie; 8:30, Gold Dust Twins; 9, Evercad-hour; 10, opera, "Norma," WEAF Grand Opera com-

mental trio; S.29, Gold, Dust Twinz; 9, Eveready hour; 10, openz, Norma, "WEAF Grand Opers comWGBS, New York, N. Y. (315.0), 5-6.38 n. U.nele 
Gechee; 7-11:0, Pred Mere; nemo; 7:20-75, boôt talk, 
painst; S.20-3:48, Elizabeth Frater Lowy, soprano; 
1-10. Peer Cynt with Arrid Paulson.
WGR, Buffalo, N. Y. (319), 2, 39-4:39, p. m. WGP; 
WGR, Buffalo, N. Y. (319), 2, 39-4:39, p. m. WGP; 
Statler dance orchestra, Harold Gleser, Griecot; 9-11. 
jainstly with WEAF, including Gold, Dust, Twins, 
WHAB, Atlante Gily, Mr. (2720, 77, 200 m.), book 
review, Mrs. James Lord; S. Seadde hotel trio; 11. 
Strand thorter organ rectal; 12, Vincent Lopez JuWHN, New York, N. Y. (361-2), 7-7-30, W. T. Terry 
McGovern's presentation of boxine selectivities; 8-8130. 
Colonial Acos; S.20-8-16, popular songs, Bob Miller; 
WHN, New York, N. Y. (361-2), 7-7-30, W. T. Terry 
McGovern's presentation of boxine selectivities; 8-8130. 
Colonial Acos; S.20-8-16, popular songs, Bob Miller; 
Prinattoin rorew with WILI Voders's corchestra. 
WIP, Philadelphia, Ps. (508.2), 6:05 p. m., Benjamin 
Pranklin concert ordersture; T. Under 
Mrs. Song of the Surf, 8:30, Vesellit's band; 10:05, weekly 
movite talk, Ell M. (1904); 10:30, Trimmer bedechestra; 11, California Night Hawks dance 
orchestra.

WJAR, Providence, R. 1. (305.9), 7:30 p. m., studio program; 8:39. Gold Dust Twins; 9. Evereaty hour, WJY, New York, N. Y. (405.2), 7:308-330 p. m., Bettle Ambassador trio; Henry Van der Zanden, director. WG, Chese, WG, Chicage, III. (372.2), 6:399-7:390 p. m., Delbard Levitow's Roled Commodors ten orderetra; Bestley Commodors ten orderetra; 8:31.0, Wall Street Journal review; 8:108-825, NYU Altr college; 8:285-10:39, Stadium concert; Rudolph Cander, Commodors (Sandy Morgania, N. Y. (376.5), 6:20 p. m., "Down Commodors (Sandy Morgania, N. Y

#### Baseball Scores

TABULATED below is a time table of the stations giving baseball scores this week. Stations are divided into the different standard times in use. The hours are given in the kind of time in use at each listed

#### Atlantic or Eastern Daylight Sav-

Atlantic or Eastern Daylight Saving Time Stations

Saturday, Angust 1: 4:30, WJZ;
5:30, WJZ; 6:40, WPG; 7:115, WOR;
7:25, WNYC; 8, WJZ; 4:30, WJZ; 4:30, WJZ;
6:40, WJZ; 6:30, WELS; 4:30, 5, 5:30, WELS; WNYC; 8, WJZ

Tuesday, August 4: 4, 4:30, 5, 5:30, WJZ; 7:15, WOR;
7:25, WNYC; 8, WJZ,

Wednesday, August 5: 4, 4:30, 5, 5:30, 6, WJZ; 7:15, WOR;
7:25, WNYC; 8, WJZ,

Wednesday, August 5: 4, 4:30, 5, 5:30, 6, WJZ; 7:25, WNYC; 8, WJZ,

Friday, August 7: 4, 4:30, 5, 5:30, 6, WJZ; 7:15, WOR;
7:25, WNYC; 8, WJZ,

Friday, August 7: 4, 4:30, 5, 5:30, 6, WJZ; 7:15, WELS,

WZ; 7:15, WELS,

WNZ; 8, WJZ,

Eastern Standard or Central Day-

#### Eastern Standard or Central Day-

Eastern Standard or Central Daylight Saving Time Stations
Saturday, August 1: 2, WGY; 2: 30,
KDKA; 2: 45, KDKA, WMAQ; 3,
KDKA, KYW; 3: 55, KWK; 4, WMAQ; 3,
KDKA, KYW; 3: 55, WWJ; 4, WMAQ; 6: 56, WWJC; 6: 56, WHC; 6: 56,

WLS; 6:30, WBZ; 6:50, WTIC; 7:30, WEBH, WLW; 9:50, WBZ; 9:55, KDKA.

WLS: 6:30, WBZ; 6:50, WTIC; 7:30, WBEH, WLW; 9:50, WBZ; 9:55, KDKA.

Central Standard Time Stations
Saturday, August 1: 3:30, WDAF,
WHAS: 4:30, WDAF, WFAA: 5,
WDAF; 6; WCCO, WDAF, WCC;
6:30, WOAW; 6:30, WSMB; 9, WCCO;
3:31, MTHE, August 2: 3:30, 4, WDAF;
6:30, WOAW; 6:30, WSMB; 9, WCCO;
3:31, WTHE, August 2: 3:30, 4, WDAF;
6:40, WDAF; 5:05, WOS;
6:45, WOC; 9, WCCO; 9:15, KTHS,
MONDAY, AUGUST; 3: 3:30, WDAF,
WHAS: 4, WCCO, WDAF; 4:30,
WFAA: 5, WDAF; 5:05, WOS;
6:WCO, WDAF, WOC; 6:30, WOAW,
WSAB: 7, WHAD, WOAI; 9, WCCO,
WCC; 6:20, WOAW; 6:30, WSAB: 7,
WHAD, WHAS; 4, WCCO, WCC;
WCC; 6:20, WOAW; 6:30, WSAB: 7,
WHAD, WHAS; 4, WCCO, WCC;
WOC, WOAF, WHAS; 9, WCCO,
WOCH, WHAS; 4, WCCO, WCC, 4:30,
WSAB; 7, WHAD, WOAI; 9:15,
KTHS; WCCO,
Thursday, August 6: 3, WDAF;
6, WCS, 6, WCCO, WDAF, WCC; 6: 30,
WSAB; 7, WHAD, WOAI; 9:15,
KTHS, WCCO,
WDAF; 4:30, WFAA: 5, WDAF; 6, WCO,
WDAF; 4:30, WFAA; 5, WCCO,
WPAA; 5, WCCO, WDAF; 4:30,
WFAA; 6, WCCO, WDAF; 4:30,
WHAS; 4, WCCO, WDAF; 4:30,
WHAS; 4, WCCO, WDAF; 4:30,
WHAS; 4, WCCO, WDAF; 4:30,
WFAA; 6, WCCO, WDAF; 4:30,
WHAS; 4, WCCO, WDAF; 4:30,
WHAS; 4, WCCO, WDAF; 4:30,
WHAS; 4, WCCO, WDAF; 4:30,
WFAA; 6, WCCO, WDAF; 8:45,
WANDAY, AUGUST 7: 6, KOA,
WHAS; 4, WCCO, WCAR; KFWM; KHI

Thursday, August 6: 6:30, KOA.
Pacific Standard Time Stations
Saturday, August 1: 2:30-5, KNX;
6, KFOA; 6:15, KPO; 8, KFWB, KHJ,
Sunday, August 2: 6:30, KFWB, KHJ,
Sunday, August 2: 6:30, KFWB, KHJ,
Sunday, August 3: 6, KFOA; 6:15,
KFO, 6:45, KGO; 7:30, KGW; 8,
KFWB, KHJ,
Thresday, August 4: 6, KFOA; 6:15,
KFWB, KHJ,
KFWB, KHJ,
KGO; 7:30, KGW; 8,
KFWB, KGB, Sid, KFOA; 6:15, KFOA; 6:15, KFO; 6:45, KGO; 7:30,
KGW; 8, KFWB, KHJ,
Thursday, August 5: 2:30-5, KFOA;
6:15, KFO; 6:45, KGO; 7:30, KGW; 8,
KFWB, KHJ,
Friday, August 7: 2, 3, 4, KNX; 6,
KFOA; KHJ, KFO; 6:45, KGO; 7:30, KGW; 8,
KFWB, KHJ,
Friday, August 7: 2, 3, 4, KNX; 6,
KFOA, KPUS, KHJ,
Friday, August 7: 2, 3, 4, KNX; 6,
KFOA, KFO; 6:45, KGO; 7:30, KGW; 8,
KFWB, KHJ,
Friday, August 7: 2, 3, 4, KNX; 6,
KFOA, KPWB, KHJ,

tic hour; 11-12. Ernie Golden and his Hotel Mc-Alpin orchestra.
WYC, New York, N. Y. (526), 7:19-7:30 p. m., dance music, the Canadians; 7:35-8, the Canadians; 8:19-8:30, piano recital, Eternam Neuman; 8:39-8:30, common recital, experimental form of the common recital; 12:09 p. m., Golden's crystal tea room orchestra; 4:45, organ recital; 7:30, A. Candelori's concert orchestra.
WOR, Newark, N. J. (495.2), 6:30-7 p. m., Man in Moon; 7:15-7:30, aports talk, Bill Wathey.

# Eastern Standard or Central Daylight Saving Time Stations

Eastern Standard or Central Daylight
Saving Time Stations

(OKA, Pithsburgh, Pa. (309.4), 8:45 p. m., concert;
19:30, concert, Grand theater,
KYW, Chiego, III. (353.4), 6-6:30 p. m., Congress
India concert, Tar. Chiego Mandard College; 7:30,
India concert, Tar. Chiego Mandard College; 7:30,
India concert, Tar. Chiego Mandard College; 7:30,
India Consect, Tar. Chiego, Tar. Day, Santora orCornace, Haroid Anderson, Al Furry, Harry Brailsford, Chiego, III. (260), 3-9 p. m., Midny danding
Gradien consessirs; Charles Daloin, bartimor Frank H.
McDuraid; Finney Britss; 19-11, Ballandina Electric
company classical concert: George Gordon, Bartinese,
Martina Bjorn, soprano; 11-12, Midway Dandeng Gardens orchestar, Warne and Glaum, harmony team;
WBZ, Springfield, Mass. (333.1), 6 p. m., Loo Reisman's Blotel Lenox ensemble; 8, Helen J. Dischert,
ulcuide soloit; 3:15, Kathryn Hornhan, soprano; Mrs.
Hell, violinist; 9, Model Brunswick orchestra.
WGEE, Elgin, III. (275), 19:39-12 midnight, Purple
WGCell, Sorth Midn. (516.9), 4:15 p. m., concert; 6,
dinner concert. Book-Cadillac hotel; 8, the Detroit
Symphony orchestra; 10, the Red Apple club Marjorie
WGEM, Chiengo, III. (370.2), 7:30-330 p. m., Oriole
concert orchestra; baseball sorves; Lydia Lochner,
contralic; musical bits, Rithern theater; 9:50-10:30,
MGES, Chiengo, III. (320), 5-7 p. m., classical program: Mrs. Peal, pianist; Manaperl Maxwell, soryano;
John Stanford, tenor; Elsie Barge, planist; Hosel
Grey, reader; 10:39-1 a. m., popular program: Novelty Broadcasters' orchestra; Eswin Pleelty, tenor;

Acatha Karlen, reader; Jelke musical moments; August Bredemeier, tonor; 8:45, (238), Elliner Kaiser's River-Ford's dance orchestra, Disk Fields, soprano; 11:40, Babee & Barr; Osear Heather, tenor; Pat Barnes; 12, Atvan Bry, tonor; Waszer and Goalano, banjo duo Wijib, Mooseheart, III. (302.0), 6:45-7:15 p. m., Belmont, botel trin; 7:15-8, Mooseheart ennert band mont, botel trin; 7:15-8, Mooseheart ennert band Skraight and his orchestra; Albert F. Browe, dramist, was the contract of the cont

"Chief Care," M. P. Adams: 10:30-1, Charley Straight and his orchestra; Albert F. Brown, or "W. S., Chienge, III. (344:6), 6:30 p. m., Ralph Emerson, organist; Martha Meier, contractio, 7:15. Revis Corribusters' enriv concert: 7:45, Iuliaby time, Aunt Jacobs, Chienge, III. (344:6), 6:30 p. m., Ralph Emerson, organist; Martha Meier, Chief Ling, Hand Ling, Land, Lan

Trianon orchestra; Charles Agno, marimoa solust; Trianon orchestra; Charles Agno, marimoa solust; WBF, Mins Den, Frac (244-b) Muse Temps; Mo Concert; 7:30-8, dance music, Pleetwood holed orchestra; 10-12, Fleetwood holed orchestra; Marting, accompanies; 0:36-18, mezeo-copyrano, Violet W0, Chicago, HI, (447-5), 7-3 D. m., Ralpho Gardens evident; 10-12, Raino Gardens Stylpriks; Editor, W0, Chicago, HI, (447-5), 7-3 D. m., Ralpho Gardens evident; 10-12, Raino Gardens Stylpriks; Editor, W0, Chicago, HI, (447-5), 7-3 D. m., Ralpho Gardens evident; 10-12, Raino Gardens Stylpriks; Editor, W0, 10-12, 1

Car company hand; Reo Motor Car company hand slee
slebs; 9:15, studio program.
SAI, Clincinati, Ohio (326), 7:35 D. m., WSAI
Radio clinnes; 8, Evereacy hour of music; 9, David
WTAM, Cleveland, Ohio (339.4), 6-70 p. m., Hotel
WTAM, Cleveland, Ohio (39.4), 6-10; D. m., Purple
Graskie boys; Harbie Mitta, Fib. Henrie, Lillian
Bernard, Tony Corcoran, Violet Eaton, Phil Wilcox.
Ruth Etlina, Ned Miller, Irries Sisters, m., Travelers,
Joucleurs; 7:10, Raymond Canfield, tenor 7:30, Austin
organ company; 3:19, Iris Gyngell, soprano; 8:29,
"Canocing in Central and Northern Mains," Henry
WWI, Detreit, Mitch, (332.27), 6 p. m., dinner concert;
7, concert from New York.

Central Standard
KFAB, Lineala, Neb, (340.8), 6-7 p. m., dinner proKFOM, Boumont, Texas (315.5), 7-7:30 p. m., dinner ProKFOM, Boumont, Texas (315.5), 7-7:30 p. m., dinner ProKFOM, Boumont, Texas (315.5), 7-7:30 p. m., dinner

KFAB, Lineain, Neb. (340,8), 6-7 p. m., dinner pro-KFOM, Beaumont, Texas (315,6), 7-7:30 p. m., chil-dren's program; 8-10:30, musical program. KFMQ, Fayetteville, Ark. (299,8), 9 p. m., D. C., Emersty, violinist, Mildred Gillersie, primies, Field Memoral pipe organ dedication, KFRU, Bristow, Okia, (394,5), 10:30-12 midnight, fish-KFRU, Bristow, Okia, (394,5), 10:30-12 midnight, fish-KFVE University City, Mo. (259), 8:30, p. m., Disc Rambler orchestra; Walter Colb, violinist; Joseph Fulle, pinnist; College entertainers; Olin Gibson, KLUS, Independence, Mo. (441), 8 p. m., IXL en-tertainers.

Krills, Springs, National Park, Ark. (374.8), 9:25 L. D. L. Lawson Reid, organist WBAP, Fort Worth, Tex. (475.9), 7:30-8:30 p. m., pro-gram, E. Clyde Whitlock, director; 9:30-10:35, mu-sicale

Words. E. Clyde Whitlock, director; wowless, and sicale. Sicale. Sicale. WCCO, Minneapolis-St. Paul, Minn. (416.4), 6 p. m., baschall; 650, Ellicy St. Faul hatel orriestra; 7-9, baschall; 650, Ellicy St. Faul hatel orriestra; 7-9, WDAF, Kansas City, Mo. (555.6), 67, p. m., planotuning-in number on the Duo-Art; Tell-Mo-a-Story lady; Plantation players.

John L. Knell, director of the lively band of syncopators known as Knell's Toklod dance orchestra, much in demand at WGR, Buffalo, although very young, is one of the best conductors of the Bast.

Photo, Colegrove Colegrov Studio.



WFAA, Dallas, Texas (475.9), 6:30-7:30 p. m. Frensley Moore and his Black and Gold orchestra; 8:30-9:30, Emmetr Peck, violinist; 11-12, G. Hayden Jones, Wend, Milwanke, Wis. (275), 6-7 p. m., Arthur Richter, orcanist. WHAS, Louisvilla, Ky. (399.8), 7:30-9 p. m., Southern Star Syncopators. WHO, Des Moines, Iowa (520), 7:30-9 p. m., musical program.

who. See Conservations. Howa (526), 7:30-9 p. m., musical program.

WMC, Memphis, Tenn. (498.7, 1:36 p. m., health talk, program.

WMC, Memphis, Tenn. (498.7, 1:36 p. m., health talk, program.

WMC, Memphis, Tenn. (498.7, 1:36 p. m., health talk, program.

WMCA, San Antonie, Tex. (394.5), 8:30-9:30 p. m., mu-day, worsen, Alias Inochen, director.

WMCA, San Antonie, Tex. (394.5), 8:30-9:30 p. m., mu-day, worsen, Alias Inochen, director.

WMCA, Banker, Neal Jones, 9. classical program; 9:46, orcinettric; 10:20, Francis Fotter's banjo orches, 9:46, orches,

KOA, Denver, Cole. (322.4), 6:30 p. m., Hingles Riddies; KOA, Lenver, Cole. (322.4), 6:30 p. m., Herbert White and hits Silver State orchestra.

Pacific Standard Time Stations

KFOA, Seattle, Wash. (454.3), 6:6:45 p. m., Olympic hotel connect orchestra. 6:45:8:15. Rinders Department of the connection of the connectio

#### Wednesday, August 5

Wednesday, silent night for: CKAC, CNRT, KFDM, KGO, KLDS, WBAV, WBBR, WCBD, WDWF, WFAA. WFI, WGBS, WGY, WHAR, WHAZ, WIP, WJY, WMAK, WMC, WOAW, WORD, WPG, WRBC, WRC, WTIC.

#### Atlantic or Eastern Daylight Saving

Time Stations

CNRO, Ottawa, Can. (435), 8 p. m., Chateau Laurier concert orchestre; Bertha De Lamendhe, contralto; A. (Continued on page 11)

# WOMEN VERSUS MEN FRIDAY AT KOA

#### Wednesday, August 5

Findley, reader; Leslie McKenna, bass; Mrs. F. Horning, violinist: Regent theater orchestra; Chab

Findley, reader; Leslie McKenna, bass; Mrs. F. J. Horning, violinist: Regent theater oriciestra; Chateau WAHG, Hichmand Hill, N. Y. (315,6), 7:30-7:45 p. m., songs, Harris and Brady; 7:35-8, sports talk, Thoraton Fisher; 8:313, Frederick C. Weister, bartione; Sth-5:30, Sid Collen, panist; S:30-8:45, Mrs. Amy Michell; 9:30-9:45, Sid Cohen; 9:35-10, Frederick Weister; 10-19:55, dance orchestra; 10, Frederick Weister; 10-19:55, dance orchestra; 11:35-11:30, dance orchestra; 12:35-11:30, dance orchestra; 13:30, talk; 10:30, Jack Myers Musical Architects. Weight Myers Musical Architects. Myers Myer

orchestra.
WIP. Philadelphia, Pa. (508.2), 3:30 p. m., Comfort's Phillarmonic orchestra; 6:05, Benjamin Franklin concert orchestra; 7, Uncle Wir's bedlime stories.
WJAR, Providence, R. I. (305.9), 7:30 p. m., program from New York.

Eastern Standard or Central Daylight
Saving Time Stations
KDKA, Pittsburgh, Pa. (309.1), 8:45 p. m., Dry Slitz
bour of music

KDKA, Pittsburgs, Fa. (309.1), 8:45 p. m., Dry Situt bour of busies, Fa. (309.1), 8:45 p. m., dinner concert, Congress hotel, 7:8. Thora Martens, contrainer, Walter D. Barnets, tenor: 8-10:30, midnight revue; WBBM, Chicago, Ill. (226), 8:10 p. m., Samorur orchestra; Nate Caldwell; Maurice Sitverman; Dave and Charlie; Harold Andreson, accordion coloits; Kelly Smith, violinist, Suncet male quarter; 12-2 m., WBCM, Chicago, Ill. (226), 7:3 p. m., Englewood Salvation Army band; 8:9, Amber Purniture company popular program; Borger Wedberg; Cameron and Fett; Ditg Boy Yagle; Pensy O'Nell, sopramo; 9-10, Englewood Salvation and company; Cameron and Fett; Ditg Boy Yagle; Pensy O'Nell, sopramo; 9-10, Englewood Salvation and company; Cameron and Fett; Bitg Boy Yagle; Pensy O'Nell, sopramo; 9-10, Englewood Salvation and Company; Cameron and Fett; Bitg Boy Yagle; Pensy O'Nell, sopramo; 9-10, Englewood Salvation of Company; Cameron and Fett; Bitg Boy Yagle; 10-11, 1002 lamborer, Johnny special; Big Boy Yagle; Pensy O'Nell, sopramo; 10-11, 1002 lamborer, Johnny special; Big Boy Yagle; Pensy O'Nell, sopramo; Marchall Mass. (333.1), 6 p. m., Medel [Xin-Marchall Mass

wood Overland company: Cameron and Faste; Big. Big. Variet; 10-11, jozz lambore; Johnny special; Big. Big. Vagie.

Yagie.

Francisco.

Fra



Mary House, left, is the attractive soprano who directs the Northern Texas Traction company programs at WBAF, Port Worth. Hulda Helen Edwards is the soprano of the KOA staff. She will take part in the program given by women only at this station, August 7.

WHT. Deerfeld. III. (398.8), 7. p. m., Al Curney exanist; Grayting's string trio; 7:30, Oscar Reinfortener; Pauline Sachs, soprano; 8. Kitchen Klenzer Klassies; Jellie nusient innoments; 8:35, (383), Elliner Klassies; Jellie nusient innoments; Scholler of the strong of the stro

chestra: Florence Tenney, Geraldine Doyle, soprano; Indiasy McPaul, Justinit; Fisher and Wayne; Harold WMBF, Miami Basch, Fla. (384.4), 7-7.39 p. m., entertainment; 7:30-3, dance music, Fleetwood hotel orchestra; 10-12. Fleetwood hotel orchestra; 10-12. Fleetwood hotel orchestra; WBRD, Batavia, III. (275), 8:30 p. m., sacred sones, H. Woodley, S. A. Choral singers; Bibte lecture, W. H. Woodley, S. A. Choral singers; Bibte lecture, W. WGI, Chicaso III. (447.5), 7-8 p. m., Bainbo Gardens orchestra; Otto A. Moore, Darltone; La Verne Hanson, plaints; Adeline Keller, contralor; 10-17. Rainbo Gardens States, Medodians; Faul Smill, tenor; Galler, Sander, Marchalder, Marchalder, Carlone, Carlone; Carlone; Telegra, Perel A. Jacobson, reader; Clarence Theders, tenor; Rick, Snyder, Gardner, Esther Trostrud, soprano; Alles Hesner, plaints; Annic Chellis, conprano; Alles Hesner, plaints; Annic Chellis, conprano; Alles Hesner, plaints; Annic Chellis, conprano; Alles Hesner, plaints; Annic Chellis, convenience, and the state of the

boys; Herbie Mintz, Evelyn Johnson, Art Stiller, Herbiert Schroeder. WTIG. Hartford, Conn. (348.6), 6:50 p. m., baseball scores. WWJ, Detroit, Mich. (352.7), 6 p. m., dinner concert.

woverse betwit, Mich. (352.7), 6 p. m., dinner concert. Central Standard Time Stations
KFAB, Lincoln, Nebr. (340.9), 6-7 p. m., dinner program; 7:30-1:30, bd. Speffert, asxonhonist; Wilhelmert, 7:30-1:30, bd. Speffert, 3:30-1:30, bd. Speffert, 3:

ACTHS. Het Spriegs Nations row.
p. in. New Arlington-Never Davis instrumental quartet.
MBAP, Fort Worth, Texas (475.8), 7:39-8:39 p. m.,
Pauther Hauvilan trio; 9:39-19-16, Fred Cathom's
WCCO, Minneapolis-St. Paul, Minn. (416.4), 7 p.m.,
midweek church service; 8. musical program; 9, baseball; 10, Diek Long's Nankin cafe orcheatra; 11:39,
Didle Dunstedler, organis (55.8), 8:9-15 p. m., classical music, Star's Radio cohestra; 11:35 p. m., Merry
Old Chief; Plantation players; Charles Dormberger's
orchestra; Kansas City Athletic club crockstra; 11:36
Mison.

Mountain Standard Time Stations

WOUNTAIN STRINGER I ME D. M., MUSICAL PROFITER IN 10-11, feature program. KOA, Denver, Colo. (32-24), 6:30 p. m. Herbert White D. D. B. Silver State Orchestra; 7:30, "Why Kids Lie," and the Silver State Orchestra; 7:30, "Why Kids Lie," and S. B. E. McKey; Elizabeth Sponcer, Molly

Spencer; "Timberline, a Forest Frontier," Charles G. Lory; Ben Henry Smith, baritone; "Has the Airplane Displaced the Battleship?" Licut. C. W. Weitzel.

Lovy, Ben Henry, Smith, bartione: "Has the Airplane Displaced the Battleship?" Lieut. C. W. Weitzel. Pacific Standard Time Stations

KFAE, Pulman, Wash, (346), 7:30-8:30 p. m., Jean Secreta, palnist; vocal duets, Alleen Maguire, Ruth Secreta, palnist; vocal duets, Alleen Maguire, Ruth Bean; book chat, Allee Lindrey Webb; "Jost Art of Ediolying Oneself," Rev. Ralbb Graves. KFOA, Settle, Wash. (4843), 5-63:58 p. m. Olymphe Bean; book chat, Allee Lindrey Webb; "Jost Art of Ediolying Oneself," Rev. Ralbb Graves. KFOA, Settle, Wash. (4843), 5-63:58 p. m. Olymphe Jany studio program; 8:30-10. Times studio program, KFWA, Hollywood, Calit, (232), 6-7 p. m., Children's hour by Big Brother of KBWB; 7-7-250, program, Mupany, Bercylridge Hawailans stringer Christian, Camp McGors, Inc., Camp Motors dance orchestra, Don McNames and Geo. Green, accordion and somes, Tom Mitchell, profits, Josufe Edward, popular dent Furniture Manufacturing company, Derk Town dance orchestra; 10-11, Warner Brothers froile, direction Charlet Wellman.

tion Charlie Wellman.

K60, Oakland, Calif. (361.2), 6-7 p. m. Ben Black's ordinestra.

K61, Oakland, Calif. (361.2), 6-7 p. m. Jactic Souders' orchestra. 750-8, basebal zoreta; 8-10, concert; 10-11. Sherman, Clay and company, concert.

KH1, Los Angeles, Calif. (468.2), 5:30-6 p. m. Leighton's Areade cafeteria orchestra, Jack Cronshaw, Edward Edward Edwards Blittones hoel concert, California, Califo

#### Thursday, August 6

Thursday, silent night for: CKAC, CNRT, KFAB, KFAE, KFDM, KFMQ, KFOA, KFUO, KFVE, KFWA, KOA, KSD, PWX, WAHG, WBAY, WCEE, WEAO, WEBJ, WHA, WHAD, WHAZ, WJJD, WKRC, WLIT, WOR, WREC, WTAM.

Atlantic or Eastern Daylight Saving

Time Stations

Time Stations

ORM. Montreal. Can. (411). 9 p. m., orchestra, White Stat-Dominion line; address; J. Kinnatrd, violinist; W. H. Brigg, cellist, enderses; J. Kinnatrd, violinist; W. H. Brigg, cellist, organization, instrumental music; 8:10, L. Marion Brown, soprano; 8:20, International Stunday school lesson, S. M. Van Sipma; 8:40, L. Marion Brown, soprano; 8:50, Instrumental music.

(Continued on page 12)

1Z, New York, N. Y. (454.3), 4:30-5:30 p. m., Bel-mont ten music; 7-7:39, Cafe Boulevard orchestra 7:30-S, Olock Vall tric; 8:30-9:39, Edson bour; 9:30-8:40, talk, "Bugs" Baer of New York American 10:30-11:39, Billy Wynne's Orcenwich Village Inr

Mrs. Arthur Jones, pianist, plays regularly at K D K A, Pittsburgh. She has become popular with Eastern

orchestra.

WILT, Philadelphia, Pa. (394.5), 7.30 p. m., Dream Daddy's bedtime stories; 8, talk, Dr. Sarl Raignel; 9, auto talk; 10, Arcadia cafe dance ornestra.

WMGA, New York, N. Y. (340.7), 6:30-7.30 p. m., Ernie Golden and his Hotal McAlpin norchestra 8:30-8.

WMGA, New York, N. Y. (340.7), 6:30-7.30 p. m., Ernie Golden and his Hotal McAlpin norchestra 8:30-endergraphic and the Machine Chestra 8:40-8.

WNYC, New York, N. Y. (326), 5-6 p. m., Spanish lessons, V. Harrison Berlitz; 7:10-7:30, song roeltal; 7:30-7:35, pollee alarms; 7:30-7:45, power of the day; 8:10-7:10-10, power or days of the da

lar songs.

00, Philadelphia, Pa. (598.2), 7:30 p. m., Walter Haelfiger, pianist; 7:45, George O'Brien, tenor; 8, U.S. Navy band; 9, Japana Troubadours; 10, Apollo instrumental trio; 10:30, A. Candelorl's dance orderstra.

witstra.

WOR. Newark, N. J. (405.2), 6:15-7:15 p. m., Troll theater orchestra; 7:15-7:30, sports talk, BHI Wathey, 7:30-8, Vincent Lopez, orchestra; 8-8:10, "Topics of the Day," Spancer Armstrong; 10:15-10:45, Jascha Gurewich Saxophone ensemble.

call music, Star's Radio orchestra; 11:45 p. m., Merry orchestra; Tharaction players; Charles Derribergur's orchestra; Teal Abletic olib Orchestra; Teal Merry orchestra; Teal Merry, Teal Merry, Darlioux, Virginia Moore, accompanist; three-minute WHAD, Louisville, Kr. (398, D. 7:30-7), Darlioux, Virginia Moore, accompanist; three-minute WHAS, Louisville, Kr. (398, D. 7:30-7), Darlioux, Virginia Moore, accompanist; three-minute WHAD, Les Meines, Iswa (256), 6:30-7:30 p. m., Bankers, Life trie; 7:30-9, Mrs. Lavere Braught, sorreno; Songs, John Woodmanes; Horman A. Brettlanner, zither soloist; 9-10, Corn Sugar orchestra; 10-11, Bar-Worth-Philipsed orchestra; Artonia, Tea. (394, 5), 8:30-9:30 p. m., army nietht Autonia, Tea. (394, 5), 8-4:455 p. m., musical primitis; 5:45-6, chimse cornect; 10-mission; 20-10-10, musicale; Evvin Swindell, organist; Mrs. John Mission, soureno.

# KDKA HONORS CARUSO MONDAY; OLD

#### Index to Popular Concerts

TABULATED below is a time table of the stations giving popular concerts this week. Stations are divided into the four different standard times in use. The hours are given in the kind of time in use at each listed station. By using this table as an index and referring to the complete programs below, full information will be obtained.

#### Atlantic or Eastern Daylight Sav-ing Time Stations

ing Time Stations
Saturday, Angust 1: 7, WGES; 8,
WBBR; 8:10, WJZ; 8:15, WEAF;
8:45, WFF; 10:15, WYC.
Sunday, August 2: 7:20, WBAF;
7:30, WEBL; 9, WNYC; 10, WNYC.
Monday, August 3: 6:30, KGES;
7:30, WAHG; 8:45, WAHG; 9, WHAR,
WOR; 9:30, WAMCA, 9:45, WHN;
10:30, WAMCA,
Thesday, Angust 4: 7, WMCA, 7:15

#### Eastern Standard or Central Day-

Eastern Standard or Central Daylight Saving Time Stations
Saturday, August 1: 6:20, WWJ; 7,
WEAR; 8, WBBM, WHT, WLS,
WMAQ, WTAS; 8:30, WMBE; 9,
WBBM, WLS, WTAM; 9:30, WMBE; 9,
WBBM, WLS, WTAM; 9:30, WMBE; 9,
WTAS; 10, WBBM, WIRC, WLS,
WQJ; 10:30, WCDE, WGBS, WHT,
WJJD, WTAM; 11, WBBM, WGBS,
WLS, WQJ; 11:30, WCEE, WJJD; 12,
WBBM, WHT, WQJ, WSAI; 1,
WBBM, WHT, WQJ, WSAI; 1,
WBBM, WTAS; 8:30, WBZ, WMBE;
Sunday, August 2: 6:20, WWBS;
WBBM, WTAS; 130, WGBS; 11,
WBBM, WTAS; 10:30, WGBS; 11,
WGBS, WJAS; 12, WBBM, WJJD; 1,
WGBS, WJAS; 12, WBBM, WJJD; 1,
WBBM, WJJD,
WMOS; 9,
WMOS

WHEO, I. WEAD, W.G., 2, 2, WEAO, W.G., 2, WEAO, W.G., 2, WEBM, WARS, 8:30, WEBM, WMBS, 9. WEBM, WMBS, 10, KYW, WHT, WIBO, W.J. WSAI, 10:30, WCEE, WEBM, WGB, WHT, WJJD; 11, KYW, WHT, WJJD; 11, KYW, WHT, WJJD; 11, KYW, WGBS, WHT, WIBO, WLS, WQJ, WSAI; 11:30, WCEE, WEBM, WJJD; 12, WGBS, WQJ; 12:30, WEBM, WJJD; 1, WQJ, 1, WQJ, 1, WQJ

Thursday, August 6: \$. WEBM. WTAS; 8:30, WMBB; 9. WBBM. WTAS; 9:30, WBEH. WMBB; 10. WBBM. WTAS; 9:30, WEBH. WMBB; 10. WBBM. WQJ, WTAS; 10:30, KYW. WEBH, WGN, WHT; 11, WHT, WQJ, WTAS; 11:15, WLW; 11:30, WEBH; 12:30, WEBH; 11. WLBO, WQJ; 2, WIBO, Edward, WEBM, WHBO, WQJ; 12:30, WEBM, WBB, WBBM, WHS, WBBM, WTAS; 9:30, WMBB; 10, KYW, WEBH, WHSO, WLS; 11:30, WGE, WGN, WJJD, WQJ; 11, KYW, WEBH, WHT, WHSO, WLS; 11:30, WGE, WGDE, WJJD, WQJ; 12, WEBH, WHBO, WQJ; 12, WEBH, WHBO, WQJ; 12:30, WJJD; 1, WQJ.

#### Central Standard Time Stations

Central Standard Time Stations
Saturday, Angust 1: 6:30, WFAA;
7, KSD; 8:30, WOAL; 9, KFRU; 9:30,
WSMB; 10, KFRU, KFVE; 10:45,
WSE; 11, KRAB, KFRU, KFVE;
WSE; 11, KRAB, KFRU, KFVE;
WSE; 11, KRAB, KFRU, KFVE;
WSE; 11, KRAB, KFRU; KFVE;
WSE; 11, KRAB, KFRU; WAA,
WOAL; 61, WEAB; 9:30, WFAA,
MOAN; 6:45, WCCO; 7:30, KFAB; 8,
KFAB, KFRU; 8:30, KFAB, WMC,
WOAL, WSMB; 9, KFRU; 9:30,
WSMB; 10, KFVE, WOAW; 10:45,
WSE; 11:45, WDAF; 6:30, WOAL; 8:30,
KFRU; WAA, WAR, WAA; 11:30, KFRU; 12, WOAW,
Wednesday, Angust 5: 7:30, KFAB,
8, KFRU; 8:30, KFAB, WSMB; 9,
KFRU; 8:30, KFAB, WSMB; 9,
KFRU; 8:30, KFAB, WSMB; 10,
KFRU; 8:30, KFAB, WDAF,
TAURSday, Angust 5: 6: 6, WOAW, 8,
WCCO; 8:30, WOAI; 9, WOAW,
KSMB; 10, KFRU; 10:45, WSB; 11, KFRU, WMC;
11:45, WDAF; 12, KFRU, WMC;
11:45, WDAF; 12, KFRU, WMC;

Mountain Standard Time Stations Sunday, August 2: 8-11, KFWA.
Wednesday, August 5: 8, KOA; 11,
KFWA.

Friday, August 7: 9-11, KFWA.

Pacific Standard Time Stations

Pacific Standard Time Stations
Saturday, August 1: 8, KFWB,
KNX: 9:30, KTCL; 10, KFF, KFWB;
11, KNX: 9:30, KTCL; 10, KFF, KFWB;
11, KNX: 10, KHF, KTCL; 12,
KFWB; 10, KFWB; 12, KFWB; 13,
Monday, August 2: 9, KNX; 10,
KFWB; 11, KFWB; 12, KFWB,
Thesday, August 4: 8, KFWB,
KNX: 11, KFWB, KNX: 10, KFWB,
KNX: 11, KFWB, KNX: 10, KFWB,
KNX: 11, KFWB,
KNX: 11, KFWB,
Wednesday, August 5: 8, KGW,
KFWB, KNX: 10, KFWB,
KNX: 11, KFWB,
KNX: 11, KFWB,
WEGNESDAY, August 6: 8, KHJ: 9,
KFWB, KNX: 10, KFWB, KNX:
Friday, August 6: 8, KFWB; 9,
KFWB, KNX: 10, KFWB, KFWB; 9,
KFWB, KNX: 10, KFWB, KFWB; 9,
KFWB, KNX: 10: 30, KGW; 11,
KFWB, KNX: 10, KFWB,
KNX; 1, KNX.



Elmer McDonald, besides being a baritone and bachelor, is reported to have a charming personality. However, he is very hard to catch, because he never stays more than a week in the same place. At the present time he is somewhere between WSB and WMC, Memphis, and expects to be in St. Lonis soon.

De in St. Lonis soon.

Forbes, soprano, Beulsh Ladon, vlollnist; 11:30-1, Oriole dance orchestra; Faul Small, songerie; Katherino, Oriole dance orchestra, Faul Small, songerie; Katherino Weisen, Wei

cert emsemble, Blackstone string quinter; 8:39-9:30, studio brogram: 10:30-11:30, Drake Holel Terrace WGY. Schenestady. N. Y. (378.5), 6:35 p. m., "The Canner's Bas of Tricks;" 6:45, Ruth Donn planist; 7:30, Martine Band; 9, "A. Trip Through South Am-William String trio; 7:30, Tony Cororan tenor; Borden Varieties, Margaret Garriy, planist; 6:75, 200 moneties under trio; 7:30, Tony Cororan tenor; Borden Varieties, Margaret Garriy, planist; 5, 300 moneties under trio; 7:30, Tony Cororan tenor; Borden Varieties, Margaret Garriy, planist; 5, 300 moneties and Martins, Harden Park Balloom orchesters; 10:30, (1093-5), protram a la carte, Sandy Mock, tenor; Si Berg, uculete solost; 10:20, 10:20, 10:20, protram a la carte, Sandy Mock, tenor; Si Berg, uculete solost; 10:20, 10:20, protram a la carte, Sandy Mock, tenor; Si Berg, uculete solost; 10:20, 10:20, protram a la carte, Sandy Mock, tenor; Si Berg, uculete solost; 10:20, 10:20, protram a la carte, Sandy Mock, tenor; Si Berg, uculete solost; 10:20, 10:20, protram a la carte, Sandy Mock, tenor; Si Berg, uculete solost; 10:20, 10:20, protram a la carte, Sandy Mock, tenor; Si Berg, uculete solost; 10:20, protram a la carte, Sandy Mock, tenor; Si Berg, uculete solost; 10:20, protram a la carte, Sandy Mock, tenor; Si Berg, uculete solost; 10:20, protram a la carte, Sandy Mock, tenor; Si Berg, uculete solost; 10:20, protram a la carte, Sandy Mock, tenor; Si Berg, uculete solost; 10:20, protram a la carte, Sandy Mock, tenor, 10:20,

and dance procram, Deberty Meiody boys; 10:30, organ soles, Nosemary Ellectrock; 10:55, onenert, WLW or; WMAIK, Lekpert, N. Y. (265.5), 11 p. m., Murray WMIGHOM, BUILIO, N. Y. (265.5), 11 p. m., Murray WMIGHOM, BUILIO, N. Y. (265.5), 11 p. m., Murray WMAGA, Chicago, III. (447.5), 6 p. m., Chicago theater organ; 6:30, Jack Chiapman's orbestra; S. Chapman's Angeles, Marias, Manasse, planist; 9:15, M. Catherine Lyons, reader; 9:30, Chapman's orchestra, WMBB, Chicago, III. (20), 7-8.30 p. m. Quarrange, 19:30, Chapman's orchestra, WMBB, Chicago, III. (20), 7-8.30 p. m. Quarrange, 19:30, Chapman's orchestra, Seventian, 19:30-10:30, Woodlawn theater of the sevential seventia

Cleveland, Ohio (389.4), 6-7 p. m., Hotel WTAM. Cleveland, Ohio (389.4), 5-7 p. m., Moca-Statics orchestra.
WTAS, Elgin, (302.8), 8-12 midnight, Purple Grand Control of the Control of

concert from New York.

Central Standard Time Stations

Central Standard Lime Stations
CNRW, Winnipea Can, (3844), 9 p. m., dance program; 10, Fort Garry hotel tric; Mrs. D. J. Edwards, contralto; Frank Reditch, cellist; Emile MigRacca, violinist.
Racca, violinist



WCCO, Minneapolis-St. Paul, Minn. (416.4), 7-9 p. m., program from New York, Atwater Kent Radio Artists; Silvertown Cord orchestra.

Silvertown Cord orchestra.

WDAF, Kansse City, Mo. (365,8), 6-70, pm. piano tuning-in number; address, Louis Meskor; Tell-Me-astory lady; Plentation players.

WFAA, Dallas, Texas (475,9), 6:30-7:30 p. m., Hauulea School of Rawrian musici, \$30-9:30, Immer's frolic, Caldwell and Marwian musici, \$30-9:30, Immer's frolic, Caldwell and this Benux Arts orchestra.

Caldwell and this Benux Arts orchestra.

WHAD, Milwankea, Wis. (275), 6-7 p. m., Arthur Eliser's Corden and Orbeit School of The Wisconsis and Eliser's Corden and Orbeit School on Marwing Corden and Corden and Orbeit School on Marwing Corden and Corden an

WHO, Des Moines, Iowa (526), 7:30-9 p. m., Leon Dashoff and his symphonic orchestra; 11-12, dance Manda and Ma Supplied (499.7), 8:30 p. m., Price Barwick company.

WMC, Memphis, Tonn. (499.7), 8:30 p. m., Price Barwick company.

WOAH, San Antonio, Tex. (304.5), 8:30-9:30 p. m., Price Barwick Company.

Manda Marking Company.

music.

WOAW. Omaha, Nebr. (526), 6 p. m., popular program; 6:20 basebalt; 6:25, to be announced; 6:45, Randalt's Royal Fontenolle orchestra; 9, De Luxe program.

VOC, Davenport, lowa (483.6), 5:45-6 p. m., chimes concert; 6, baseball scores; 7-8, Atwater Kent Radio Artists, WEAF; 8-9, Sitventown Cord orchestra, WEAF; 11-12, LeClaire hotel orchestra; Peter MacArthur, bartique.

WSMB, New Orleans, La. (319), 6:30-7:30 p. m., en-tertainment; 8:30-10:30, New Orleans Harmony Kings; Sunshine Twins.

Mountain Standard Time Stations
KOA, Deaver, Colo. (322.4), 6:30 p. m., dinner concert, Herbert White and his Silver State orchestra;
8, Denver municipal band.

Pacific Standard Time Stations Pacific Standard Time Stations
(FWB, Hellywood, Calif. (252), 7:40 m.m., Flishing
streams and fish, Jack Boaz, fishing scout; 7:55, pinsstreams and fish, Jack Boaz, fishing scout; 7:55, pinslarge company: Hollywood Rythma Nirgorma, Narelarge company: Hollywood Rythma Nirgorma, Day
large company: Hollywood Rythma Nirgorma, Day
eli Butler, soprano, Jack Wilson and his ukuiele; 9-10,
protram, Dan P. Smith, Inc., Diam-Mono dance orprotram, Dan P. Smith, Inc., Diam-Mono dance orHawlians; 10-11, Warner Bress, 17016, discelates Charlie
Wellman.

Wellman.

KGO. Oakland, Calif. (361.2), S p. m., "The Thirteenth Chair," three-act drama, KGO players; 10-1
a. m., Clarke Wilson's Hotel St. Francis dance or-

a. m., Clarke Wilson's Hotel St. Francis dance or-chestra. KGW. Pertland, Gre. (491.5), 7:30-8 p. m., baseball scores; 8-9, concert; 9-10, concert; 10-12, Kenin's Multoomah hotel orchestra.

scores; 8-9, concert; 9-10, concert; 10-10, Keulin's Mullmomah hotel orchestra.
KH1, Les Angeles, Calif. (495.2), 5:39-6 n. m., Lefghton's Acrade cafeteria orchestra, Jack Cornolhaw, Icader's California of California orchestra, California orchestra, California orchestra, California orchestra, California orchestra, California orchestra, Edward Filapatrick, director; 0:39-750. Thorchestra, Edward Lincolnia orchestra, Earl Burtnett, leader.
KNX, Hollywood, Calif. (338.9), 5:30-6:15 p. m., Wurllicer Uple organ studio; 6:15, travel talk, W. P. Holley, California, Ca

#### DANCING

Central Standard Time
Saturday, August 1: 3,
Sasy, Wigh, Winbb, Wans,
Sasy, Wigh, Winbb, Wans,
Sasy, Winb, Winb,
Winbt, Winch, Winbt,
Winbt, Winch, Winbt,
Winbt, Winch, Winbt,
Winbt, Winch, Winbt,
Winbt, Winch,
Winbt, Winbt,
Winbt, Winbt,
Wind,
Wind, Winc,
10, Kfree,
Kfne,
Wind,
Wi Central Standard Time

11.29. Wilai. 11.23.
Widaf.
Tuesday, August 4: 8.
Widaf.
Wanbb, Wasi, Wilai.
Wanbb, Wasi, Wilai.
Wanbb, Wasi, Wilai.
Wilai.
Windf, Wilai.
Wila

#### Thursday, August 6

#### (Continued from page 11)

chestra. WDWF, Providence, R. I. (440.9), 6:30-8 p. m., Nar-

WDWF, Providence, R. I. (440.9), 6:30-8 p. m., Narraganseth hole orchestra, WEAF, New York, N. Y. (491.5), 4-5 p. m., musical program; 6-7, dinare music, Waldorf-Astoria; 7-7:30-8, services, New York Federation of Churches; 7:30-8, services, New York Federation of Churches; 7:30-8, services, New York Federation of Churches; 7:30-8, 9-10, Awater Kent Radio artists; 10-11, Silventow Cord orrhestra; 11-12, Vincent Lopez Hole Pennsylvania orchestra; 11-12, Vincent Lopez Hole Pennsylvania orchestra; 11-12, Vincent Lopez Hole Pennsylvania orchestra.

WEEI, Boston, Mass. (475.9), 7:30 p. m., musicale, New York, New

steal scores of "The Birth of a Nation," Piceadilly theater.

Matter Market Mar wGR, Buffalo, N. Y. (349), 2:30-4:30 p. m., WGR's afternoon program: 6:30-7:30. Vincent Long-Hotols and Dave, Marcioe Silver-silver program: 6:30-7:30. Vincent Long-Hotols and the Mozart Instrumental ensemble.

WHAR, Atlante City, N. I. (275), 7:30 p. m., Seaside hotel of 2.50. Vincent Long-man the Mozart Instrumental ensemble.

WHAR, Atlante City, N. I. (275), 7:30 p. m., Seaside hotel of 3.50. Vincent Long-man recital, Loew's Loxination theater; 8-5:30, Will Oathand Schuler, William S. S. Anne, French barilone; Ann Williams, and recital, Loew's Loxination theater; 8-5:30, Will Oathand's Challenau Shanley; 8-30-3:45, Endl West, 50 mins of the Company of the

talis, Bill Wathey,

Eastern Standard or Central Daylight

Saving Time Stations

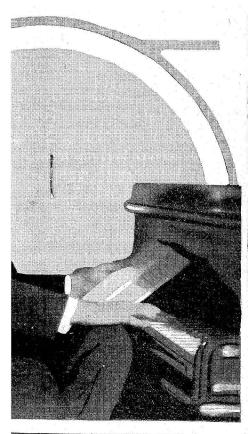
KDKA, Pittsburgh, Pa. (309.1), 835 D. m., concert;

KDKA, Pittsburgh, Pa. (309.1), 835 D. m., concert;

KDKA, Pittsburgh, Pa. (309.1), 835 D. m., concert;

KDKA, Saving S. Saving, S

# OLD TIME POPULAR SONGS AT WAHG



Friday, August 7

Friday, silent night for: KFAE, KFUO, KFMQ KGO, KLOS, PWX, WBBR, WCBD, WEAO, WFI WGBS, WHA, WHAZ, WIP, WKAQ, WKRC, WLW WMAK, WOR, WRC, WSAI, WTAM. Atlantic or Eastern Daylight Saving

time straight and weather report; 11:05-11:30, dance or corcustra.

WGAE, Pittsburgh, Pa. (461.3), 6:30 p. m., dinner concert, William Penn hotel; 8. address, Current Moor Toples; 8:30, studio concert; 10, dance music, Sander's WGAU, Philiadelphia, Pa. (272), 6:30 p. m., Billy Hayes and his Cathay Tea Garden dance orchestra; 10:35, Jack Myers Musical Architects dance orchestra; 10:35, Jack Myers Musical Architects dance orchestra; united to the concern of the concern

stories.
WJAR, Providence, R. I. (305.9), 8 p. m., musical program; 9, Maine Creamery hour; 11, Providence Bilt-

#### DANCING

DANCING
Central Standard Time
Saturday Angust 1 - 8,
80 Wey Wey Wybb, Was95 Wip; 8:30, Webb,
12 Wamb; 9 Webb,
13 Wece, Wres, Wand,
13 Wece, Wres, Wand,
14 Wece, Wres, Wand,
15 Webb,
16 Webb,
17 Webb,
18 Webb,
19 Webb,
19

Kill August 3: S.
c. Windb, Weas;
Wear, Wsub;
Wiz, Wor; 9.
c. Wig, Warb;
9:05. Walg; 9:25.
9:30. Weee, Wijd,
ar; 10, Kpo, Who,
f, Wtam; 10:30,
b, Wijd; 11, Who;
c, Wijd; 11:45,

133. Wijd; 11:45.
14af. August 4: 38.
Tuesday, August 4: 38.
Tuesday, William 4: 38.
Tuesday, William



Leo Reisman is the leader of the Hotel Brunswick orchestra, which is a regular feature of the WBZ programs. He also directs the Reisman's Hotel Lenox en-semble in dinner music twice a week. Marie Winters is the station pianist at WBEM.

WBBM.

8-45. Emmett Welte's Minstrels; 10. Morning Glory 100 concert; Arcadia cafe dance orchestra; Songs by Mindre Concert, Arcadia cafe dance orchestra; Songs by Mindre Concert, Arcadia cafe dance orchestra; Songs and Chas. Frey's Million Dollar Pier orchestra. WmCA, New York, N. Y. (340-7), 6:30-7:30 p. m., Emmie Golden and his Hotel McAlpin orchestra; Songs and Chas. Songs and Mindre Concert, Songs and Chaster Concert, Mall. Central Wood, Philadelphia, Pa. (56-22), 7:30 p. m., Condelou's dance orchestra; Songs and Chaster Concert, Mall. Central Wood, Philadelphia, Pa. (56-22), 7:30 p. m., Condelou's dance orchestra; 3:30, recitat; 10, organ recitat, Newell Robinour; 10:30, A. Candelou's dance orchestra, Wall. Welter, 13:30-7:30 p. m., Sports Exacter Tstandard or Central Daylight Saving Times Saving Times Saving Times (SDA).

Atlantic or Eastern Daylight Saving
Time Stations
CNRT. Torento, Can. (357), 8300 p. m., Luigt Romanelli and his King Edward hotel concert orbesters,
2:39, Harold R. Frost, planist; Torda, Ward Buchner,
tudinist; Jessie Archer, soverant; Bebourd Smeal,
tudinist; Jessie Archer, soverant; Bebourd Smeal,
Ward Hosel Archer, soverant; Bebourd Smeal,
ward hotel dance orchestra.
WARG, Richmond Hill, N. (315.0), 730-745 p. m.,
Ted Savider, planist; 7:45-5, sports talk, Thomton
ASI-58-30, Marguerite Belling, soprant,
8:39-8:45,
"Buglish," Professor Hichard E. Mayne; 8:35-9, Stellratio Cambris, amadolinist; 9-0:15, Marguerite BelCambris, 1:55-30, Rel.
Savider, June 19:35-11:26,
Gunestin box; 10:35-10:26, done orchestra; 10:55-11:26,
time sixuals and weather report; 11:05-11:30, dance
organism.

The control of the co beth Wade; \$330-9, Eagle Neutrolyne trie; \$15-10-15, Goldman hand concert; 1-12, Hotel Bossert Marine Wood cochesitate, N. Y. (2726), 7-5/20 p. m., Blender Greiner, N. Y. (2726), 7-5/20 p. m., Blender Greiner, S. G. Scholler, Stockhalm hand; \$8-815, Elly Roman, soprano; George Abbey, planis; \$330-9, Atthur Pryor's band.

WEEI, Boston, Mass. (475-9), S. p. m., Neapolitan Ice Creum concert; \$3:30, mustalet; p. Ed. Andrews and WFI, Philadelphia, Pa. (394-5), 6-25 p. m., Bellevue Stratford Moof Gardien ordeistra.

WEIS, New York, N. Y. (315-5), 6-6:30 p. m., Under Creum Concert, \$3:30, mustalet, p. 20, who was a few for the concertaints. WGES, New York, N. Y. (315-5), 6-6:30 p. m., Under Greiner, Philadelphia, Ph. (275-20), Winger's Crescent Park entertainers, "The Village Blacksmitt Shop?" 9-10:30, popular program in charge of Earl Chultz; 1:1-a m. strend and the concentrations of the concentration of

serenaders.

WGN, Chicago, III. (370.2), 6:30-7:30 p. m., Drake concert ensemble, Blackstone string quintet; 8:30-9:30, studio program: 10:30-11:30, Drake Hotel Terrace

serenacers.

WGN. Chicago, III. (370.2), 6:39-7:30 p. m. Drake concert ensemble. Blackstone string quintet; 8:39-9:30, and the concert ensemble. Blackstone string quintet; 8:30-9:30, and the concert ensemble. Recommended the concert ensemble ensem

10:39, Charley Straight and his orchestra; Albert F. Brown, organis;
WLS, Chicago, III. (344.6), 6:30 p. m. Ralph Enerson, organist; 7:15, Rev S Cornbuskers; early concept; 7:35, Julaby Ume, Aunt Martha and Unele Grant Charles, Charles,

WJAR, Providence, R. 1. (305.0), 8 p. m., musical program; 9, Maine Creamery hour; 11, Providence Billmore dance orchestra.
WIY, New York, N. Y. (405.2), 8:30-9:30 p. m., New York university cencert; 9:50-10:30, United States WJZ, New York, N. Y. (464.3), 7-8 p. m., Savarin nesemblo; 8-8:10, Wall Street Journal review; 8:10-8:30, NYU Air colless; 10:30-11:30, Ben Glaser's orchestra with Nay Martio.
NYU Air colless; 10:30-11:30, Ben Glaser's orchestra with Nay Martio.
Daddy's bostime stories 8. Coon Sanders Nighthawks and Charles Yrey's Million Doltas Pior oxiderire;

#### Index to Classical Concerts

T ABULATED below is a time table of the stations giving classical concerts this week. Stations are divided into the four different standard times in use. The hours are given in the kind of time in use at each listed station. By using this table as an index and referring to the complete programs below, full information will be obtained.

#### Classical

Class

Atlantic or Eastern Daylight Saving Time Stations

Saturday, August 1: 6, WEAF, 6:05, WIP; 6:30, WCAE; 6:45, WPG; 7, WEAF, 16:30, WEAF, WGES; 7:45, WGR; 8, WEAF, WBBR, WHAR, WIP, WNYC; 8:25, WPG; 8:10, WGBS; 8:15, WNYC; 8:25, WIZ; 8:30, WCAE, 8:15, WNYC; 8:25, WIZ; 8:30, WCAE, WGBS, WGR; 8:46, Subra, WEAF, 8:50, WIP; 9, WGBS, WPG; 9:50, WGBS; 10:15, WEAF, 10:30, WEAF, Sunday, August 2: 6, WOO; 6:30, WCAE; 7, WIZ; 7:20, WCAE; WEBT, WIZ; 7:20, WCAE, WEBT, WHAR; 9:15, WCAE, WEAF, WEDT, 11, WHAR; 9:15, WCAE, WEAF, WEAF,

WCAE; 7, WIZ; 7:20, WCAE, WEBI; 8:30, WEBI, WIY, WIZ; 8, WBBR, WHAR; 9:15, WCAE, WEAF, WEBI; 11, WHAR; 9:15, WCAE, WEAF, WEBI; 11, WHAR; 8:05, WIP; 6:30, WCAE; 7:15, WGAE; 7:20, WGAE; 7:

#### Eastern Standard or Central Day-light Saving Time Stations

Saturday, August 1: 6, KYW, WCX, WIBO, WGES, WMAQ, WTAM: 6:30, WGN; 6:45, WJJD; 7, KYW, WHT, WIBO, WMBB, WQJ; 7:15, WJJD; 7:25, WGY; 7:30, WRC; 7:35, KYW; 7:45, WLS; 8, WORD, WSAI, WTAM; 8:15, WSAI, WWJ; 8:30, KYW, PWX, WGN; 8:45, KDKA; 9, WMAQ; 9:15, WSAI,

WGN; 3:45, KDKA; 9, WMAG; 9:15, Sunday, August 2: 6, WCX, WGES; 1:30, WHT; 6:45, WORD; 7, WEAR, WBEH, WMBE; 7:16, KDKA; 7:30, EEH, S, WEZ; 9, WGN, WGJ; 10, WKHC; 10, WGJ; 10, WKHC; 10, WGJ; 10, WKHC; 10, WGJ; 1

9:15, WBZ; 10, WSAI, WTAM; 12:30, WHT.

\*\*Thresday. August 4: 6, WBZ, WCX, WBS, WIBO, WMAQ; WTAM; WTAM; WBS, WIBO, WTAM; WHO, WHO, WHO, WHO; WHO; WHO; WHO; WHIC; T15, WJID; T30, WCX, WEBH, WRC, WTIC; T45, WSAI; 8: KYW, WBZ, WBAR, WSAI; 8:10, WTIC; 8:30, WBZ, WCX, WGN, WMAQ; 8:45, KDKA, KYW, 9, WEAR, WORN, WAQ; 8:45, KDKA, KYW, 9, WEAR, WDA, WSAI; 10, KYW; 19:30, KDKA; 11, WKRC; 12:30, WGA, WGN, WAG, WGN, WAG, WGN, WGN, WGN, WGN, WGN, WGS, WIBG, WMAQ, WTAM, WWJ; 6:15, WJD; 6:30, WGN; 7,

Sical

KYW, WEAR, WHT, WIBO, WMBB, WQJ; 7:15, WJJD; 7:30, WCX, WEBH, WHT, 8, KYW, WBZ, WTAM; 8:30, PWX, WBZ, WCX, WGBH, WORD, 8:45, KDKA; 8:50, WBZ, 8:55, WMAQ; 10, WTAM, WTAM; WGBS, WGO, WMAQ, WTAM, WGBS, WGO, WMAQ, WTAM, WHIO, WMBS, WGO, 7, WS, WHT, WHIO, WMBS, WGO, 7, WS, WHT, WGBS, WGO, 8, WGBS, WGO, 8, WGBS, WGC, 8, WGBS, W

Central Standard Time Stations Central Standard Time Stations Saturday, August 1: 6, KFAB, WOAW, 6:30, WCCO, WFAA, WSMB: 7:39, KENF, WHAS: 8, WCCO, WSB; 8:39, WFAA, WHAS, WMC: 8:35, KYW, WOAW, WOC. 5:30, WHO, 8, KFDM, WCBD, WSB, 9, WOAM, 9:16, KLDS, WCCD, 9:25, KYES; 9:30, WOC; 10, KFYE; 10:30, WOO: A COMMENT OF THE STATE OF THE STAT

9, WOAN; 9:16, KLDS, WCCO; 9:26; KTHS; 3:30, WOC; 10, KFVE; 10:30, WOC; Monday, August 3: 6, KFAB, WOAN; 6:324 WFAA, WSMB: 6:45, WCAC, WEND, WHAD, WSMB; 6:45, WCAC, WHAD, WSMB; 8:30, WFAA, 19, KSFD, WWAD, WOAN, WOAN; 9:55, KTHS; WOAN, WOAN; 9:55, KTHS; WHAD, WOAN; 9:55, KTHS; WHAD, WGCO, WGCO; 7:30, KFMF, WHAS, SED, WOC; 7:30, KFMF, WHAS, SED, WOC; 7:30, KFMF, WHAS, WGCO, WOAN, WOAN, WOAN; 9:25, KTHS; WOAN, WOA

MOUNTAIN, WOAW, WOC, 51:25,

MOUNTAIN Standard Time Stations
MOUNTAIN AURUST 3: 6:30, KOA; 8, KOA; 9:11, KTWA.
TINESTAY, AURUST 5: 6:30, KOA; 8, KOA; 9-11, KTWA.
S, KOA; 9-11, KTWA.
THURSTAY, AURUST 5: 6:30, KOA; 8, KOA; 9-11, KTWA.
Priday, August 7: 6:30, KOA; 8, KOA.
Priday, August 7: 6:30, KOA; 8, KOA.
Priday, August 7: 6:30, KOA; 8, KOA.

Priday, August 7: 6:30, KOA; 8, KOA.

Pacific Standard Time Stations
Saturday, August 16, KFOA, KHJ;
6:30, KNX; 8:10, KGO; 8:15, KFOA;
Sunday, August 2: 6:30, KHJ; 6:35, KPO; 7, KHJ, KNX; 8, KNX, KPO;
9, KNX; 10, KNX; 8, KNX, KPO;
9, KNX; 10, KNX; 8, KNX, KPO;
9, KNX; 10, KNX; 6:45, KFOA, KGO;
6:30, KNX; 6:45, KFOA, KGO;
6:30, KNX; 6:45, KFOA; 7; KNX, KFO;
7, KNX, KFOA; 7, KNX, KFOA; 7; KNX, KFOA; KFOA; 8, KNX; 8:30, KFOA; KFO

Trianon orchestra; Jack Murnane, baritone; Woodlawn theater orchestra; Morey Alswang, banjoist; Florence Baby Blues Tenney; Clyde Hager.

Dany Sides Tenney; Olyde Hager.
WMBF, Miani Beach, Fla. (384.4), 7-7:30 p. m., studio concert; 7:30-8, dance music; 10-12, Flestwood hotel orchestra.
WORD, Batavia, III. (275), 8:39 p. m., Uncle Dan's study club; 9, Bebe Leviton, Anne Spiegel, plane solos, ducts.

stato chart s. Dece Leviton, Anne Spiege, piano solos, ducts.

11. (447.8), 7.8 p. m., Rainbe Gardon Solos, ducts.

4 den Gardon Skjutars, West Brothers; William Richardson, bartlone; Paul Small, tenor; Jack Lavin, tenor; Ireno Finucan, soprano; Antia Chellis, contraito; Roso Quinn, contraito; Elexnor Terry; Marie Pollette; Sonsiel trie, 1-2, Ginger hour.

4 TAM, Oleveland, Dhio (538.4), 6-7 p. m., Golden Processari orthesira.

4 TAS, Elpin, Ill. (302.8), 8-10:30 p. m., Purple, Graekle erobestrate Hebite Mintx, Marie Weight.

Tommy Dunlap, Brock Sisters, Art Stiller, Walter Donovan.

#### Central Standard Time Stations

KFAB, Lincoln, Nebr. (340.8), 6-7 p. m., dinner pro-gram; 7:368-R. Rep. 36. General din Blue Moon dance current, 18-2. General din Blue Moon Mrs. Murray contrains in the Mrs. Lindley, pri-anist; H. F. McCulla, bartone; Colonians; dance orchestra.

# An Evening at Home with the Listener In

	A17	10 March 10				
<b>STATIONS</b>	IN	ORDER	OF	WAVE	LENGTHS	USED

	1000 11		1000								
Meters	Call	Mete:	rs Call	Meter	s Call	Meter	rs Call	Meter	rs Call	Meter	s Call
226 W	VBBM	278	KOIL	315.6	KFDM	365.6	WDAF	405.2	WOR	468.5	WCAP
	WIBO		KWWG	315.6	WAHG	365.6	WHB	406	WBAR	468.5	WRC
	SFVE	278	WCAU	315.6	WGBS	370	CYB	410.7	CKAC	475.9	WBAP
243.8 W	VAMD	278	WLBL	319	WGR	370.2	WEBH	416.4	WCCO	475.9	WEEL
	WGES	278	WRBC	319	WSMB	370.2	WGN	421	KIAF	475.9	WFAA
	VMBB	280.2	WNAC	322.4	KOA	374.8	KTHS	422.3	WLW	480	CYL
	FWB	282.8	WOAN	325.9	WSAI		WGY	428.3	WSB	483.6	WOO
	WGCP	285.5		326	WKRC	379.5	WHAZ	428.3	KPO	483.6	WSU:
	FWA	285.5	WREO	330	CYX	384.4	CKY	434.5	CNRO	491.5	KGW
265.5 W	MAK	293.9	KJS	333.1	WBZ	384.4	KJR	434.5		491.5	WEAF
266 I	KFNF	293.9	WBAY	340.7	WKAQ	384.4	WMBF	435	AT9	499.7	WMC
266 V	VBCN	293.9	WEAO	340.7	WMCA	389.4		434.5	CFCN	508.2	KLX
272.6 V	VBBR	296.9	KPRC	340.8	KFAB	389.4	WTAM	440.9	KLDS	508.2	WIE
272.6	WEBJ	299.8	KFMQ	344.6	WCBD	394.5	KFRU		WDWF	508.2	WOO
272.6 V	VFBH	299.8	KSL	344.6	WLS	394.5	WFI	440.9	WOS	516.9	CJCA
273	WRW	299.8	WPG	348.6	KFAE	394.5	WLIT	447.5	WMAQ	516.9	WCX
	KFAU	302.8	WJJD	348.6	WTIC	394.5	WOAL	447.5	WQJ	526	WHO
	WCAC	302.8	WTAS	352.7	WWJ	399.8	WHAS	454.3	KFOA	526	WNYC
	CLAHV	305.9	KTCL	356.9	CFCA	399.8	WHT	454.3	WJZ	526	WOAW
	VHAR	305.9	WIAR	356.9	CHNC	400	PWX	455	KTW	535.4	KYW
	VORD	309,1	KDKA	361.2	KGO	405.2	KHJ	461.3	WCAE	545.1	KFU
275.3	WJAS	313	CNRA	361.2	WHN	405.2	WJY	467	KFI	545.1	KSI

#### INSTRUCTIONS FOR USE OF TABLES

INSTRUCTIONS FOR USE OF TABLES

The periods given in the "Evening at Home with the Listener In" table is not difficult to understand and use. It is this fact that makes it so popular with the readers of Radio Digest. It is presented here in three different standard times; Eastern, Central and Pacific. Listeners using one of the three kinds of time named, should utilize the table printed in that time and so designated by its headline.

For listeners whose standard of time is not shown here, the following instructions should be remembered:

Listeners using Mountain time; Use table for Pacific time but add one hour to every figure given.

Listeners using Eastern daylight saving; or Atlantic time: Use Eastern time table. No changes are necessary.

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given.

Listeners using Central daylight saving time: Use Eastern time table. No changes are necessary.

#### Friday, August 7

(Continued from page 13)

KFDM, Beaumont, Tex. (31.6.), 3-10.30 p. m., Magnalla Petroleum company's Refinery band. (KFF, Shendodah, In. (260), 17.30 m., concert, KFFD, Bertaley, Charles, Char

musical program; 12°1, Virginia Lipens, 10°10, 10°1

Kansas City Allidetic club orderstra; Earl Colcomar's orderestrations, and the control of the co

WHAS, Louisville, Ny, Louisville, Ny, Louisville, Masic and Radio company cert, anothers Louisville Masic and Radio company cert, another Louisville, and the Radio company of the Radio Carlotte, and the Radio Carlotte, and Radio Radio Carlotte, and Radio Carlotte, and Radio R

tertainment, levilisht tales.

Mountain Standard Time Stations

KFWA, Ogden, Utal (261), 9-10 p. m., studio program

10-11, program of the control of the co

Pacific Standard Time Stations

Facific Standard Time Stations

KFAE Pullman Wash. (348.0), 8:15 p. m. "The
Flist Year," students of speech department.

KFOA, Scattle. Wash. (454.3), 6:15 p. m. baseball
results, Olympic Intel concert orchestra, 3:45:451.9

Times, studin program: 10:097:mm; 8:29-10. Scattle
music.

THOSE, SUGIO PROGRAM: A CONTROL OF THE PROGR

KGO, Oakkand Calif. (361.2), 6-7 p. m., Ben Black's Corbestra. Condendaria Control Con

pany; 7:30-8, program of musical gens, Eastern Out-fittin; company; 8:4, West Coast theators by remote partial programs of the program; 1:12, Abe Lyman's Coconius, Foreign of the program; 1:12, Abe Lyman's Coconius, Grove dance orchestra from Am-bassador hotel. KPO, San Francisco, Calif. (428.3), 6:15, p. m., Loew's Warfield theater program; 7:7:30, Palace hotel con-ert orchestra; 8:11, Palace hotel concent

#### KGO BANS SWISH. HISS AND CLICKS

Teachers on Radio Classroom Instruction Schedule Must Pass Rigid Examination

SAN FRANCISCO.—When Radio is used for classroom instruction, teachers before the microphone must speak without making funny lip noises, hissing sounds, or taking breath quickly with a

out making funny lip noises, hissing sounds, or taking breath quickly with a swish. All such noises were found to be objectionable in recent examinations of teachers for microphone instructors by educators at KGO here, preparing courses of classroom instruction for the Oakland public schools, where Radio is now an integral part of the system of instruction. Teachers were required to pass tests, during which they spoke into a sensitive condenser microphone, while keen ears listened in for objectionable sounds found bad for school work.

In the KGO tests it was found that smacking of lips, clicks of the tongue, sudden takings of breath, whistling sounds, hissing of sibilants, not noticeable in conversation, are picked up by the microphone and are objectionable to children in the school rooms.

#### Radio Class Completes Its Course in Poultry Raising

SPRINGFIELD, Mass.—Certificates will soon be issued to a large majority of the 200 students who recently completed a course in poultry flock management which was given over Station WBZ by Prof. William C. Monahan in the role of lecturer. These listeners enrolled for the course in the Massachusetts Agriculture college and took it seriously enough to pay an entrance fee in advance. More courses in this Radio college will be offered in the future.

#### Dismantle Marconi Set

LONDON, Eng.—The Famous Marconi Radio station at Clifden, Ireland, is to be dismantled, and has been sold for that purpose. This station has played a leading part in the development of Radio transmission; it was the first Radio station to have regular communication with America.

#### (FOR PACIFIC TIME)

ı			of all a	(	FOR P.	ACIFIC	TIME)				
ľ	Call [	Met.	Saturday	Sunday	Monday (	Tuesday	Wednesday	Thursday	Friday	Met.	Call
	ΛT9	435	Silent Silent	3:00- 4:00	Silent	Silent	Silent	5:00- 7:55	Silent	435	AT9
П	CFCN	356.9 434.5	9:00-11:00	4:00- 5:00 Silent	Silent	5:15- 6:15 Silent	5:15- 6:15 Silent	5:15- 6:15 7:00- 8:00	Silent	356.9 434.5	CFCA
		356.9 516.9	Silent 8:00-10:00	Silent 6:30- 7:30	4:30- 5:30 6:30- 8:30	Silent 6:30- 7:00	Silent 5:00- 7:00	Silent 8:00-10:00	Silent 7:00-11:00	356.9 516.9	CHCN
	CKAC	410.7	4:30- 9:30 Silent	1:30- 2:30 5:00- 7:45	Silent	4:30- 9:30 6:30- 8:45	Silent Silent	4:30- 9:30 6:00- 7:00	Silent 6:30-7:45	410.7	CKAC
l (	NRA	313	Silent	Silent	Silent	4:30- 5:30	Silent	Silent	4:30- 5:30	313	CNRA
	CNRO CYB	434.5 370	4:30- 9:30 8:15- 9:45	Silent Silent	Silent Silent	Silent 7:15- 8:15	4:30- 9:30 Silent	Silent Silent	Silent Silent	434.5 370	CNRO
1	CYL	480 330	Silent	Silent	Silent 7:15- 8:30	8:00- 9:30 Silent	Silent Silent	Silent	8:00- 9:30 7:15- 8:45	480 330	CYL
	KDKA KFAB	309.1	5:45- 6:55	4:00- 5:00 2:00- 3:00	5:45- 6:55 5:30- 7:30	5:45-8:30	5:45- 6:55	5:00- 8:30 Silent	5:45- 6:55	309.1	KDKA
		340.8 348.6	Silent	Silent	Silent 7:00- 9:00	Silent Silent	5:30- 7:30 7:30- 9:00	Silent	5:30- 8:00 Silent	348.6 275	KFAB KFAE
	KFDM	275 315.6	Silent Silent	Silent 6:00- 7:00	Silent	Silent 6:00- 8:30	Silent Silent	Silent Silent	7:00- 9:00 6:00- 8:30	315.6	KFAU
	KFI KFMQ	467 299.8	6:45-12:00 Silent	4:00-11:00 Silent	6:45-11:00 Silent	7:00- 8:00	5:30-6:30	6:45-11:00 Silent	6:45-11:00 Silent	299.8	KFMQ
1	KFNF	266 454.3	5:30-7:30 6:00-11:00	4:30- 7:15 Silent	5:30- 7:30 6:00-10:00	5:30-7:30 6:00-11:00	5:30-7:30 6:00-10:00	5:30- 7:30 Silent	5:30-7:30 6:00-11:00	266 454.3	KFNF
ш	KFRU	394.5	5:30-10:00	3:90- 5:90 6:15- 7:15	5:00- 8:30 6:00- 7:00	8:30-10:00	6:00- 8:30	8:30- 9:30	9:00-11:00	394.5	KFRU
1	KFU0 KFVE	545.1 240	Silent 8:00-10:00	Silent	8:00-10:00	Silent 8:00-10:00	7:15- 8:15 8:00-10:00	Silent Silent	Silent 8:00-10:00	545.1 240	KFU0 KFVE
1	KFWA KFWB	261 252	Silent 7:00-11:00	9:00-11:00	8:00-10:00 6:30-11:00	Silent 7:45-11:00	8:00-10:00 7:00-11:00	Silent 7:00-11:00	8:00-10:00 7:00-11:00	261	KFWA KFWB
t	KGO KGW	361.2 491.5	8:00-1:00 6:00-12:00	3:30- 9:00 7:45- 9:00	8:00- 1:00 Silent	8:00-1:00 8:00-11:00	Silent 6:00-11:00	8:00-1:00 8:00-12:00	Silent 6:00-12:00	361.2 491.5	KGW
_ [	KHJ	405.2	5:30-11:00 Silent	6:00-11:00 2:00- 3:00	7:00- 1:30	5:30-11:00 Silent	7:00- 8:00	5:30-11:00	5:30-11:00	405.2	KHI
	KJR	384.4	Silent	7:00- 8:00	7:00-11:00	Silent	7:00-10:00	Silent 8:30-12:00	7:00- 8:00 8:30-11:00	384.4	KIAF
-	KJS KLDS	293.9 440.9	Silent	7:15- 9:30 4:30- 8:00	Silent	8:00- 9:00 6:00- 7:00	Silent Silent	8:00- 9:00 6:00- 7:00	Silent	293.9 440.9	KLDS
1	KLX	508.2 336.9	Silent 8:00- 2:00	Silent 5:00-11:00	6:00-11:00 6:30-12:00	Silent 6:30-12:00	6:00-11:30 7:00-10:00	Silent 6:30-12:00	6:00-10:30	508.2 336.9	KNX
11	KOA KOIL	322.4 278	Silent 5:30- 7:00	3:00- 8:00 5:30- 6:30	5:30- 8:00 5:30- 6:30	Silent 5:30-10:00	5:30 - 8:00 5:30 - 6:30	Silent 5:30- 7:00	5:30-8:00 5:30-10:00	322.4 278	KOA
1	KP0	428.3 269.9	6:35-12:00 5:30- 8:00	6:30-10:00 6:00- 7:00	6:30-11:00 5:30- 8:00	6:30-11:00 5:30- 8:00	6:30-11:00 5:30- 8:00	6:30-11:00	7:00-11:00 Silent	428.3 269.9	KPO
3	KSD KSL	545.1 299.8	5:00- 7:80 7:00-10:00	Silent	7:00- 9:00 7:00-10:00	6:00- 8:00 8:00-10:00	5:00- 6:00 7:00-10:00	Silent	5:00-6:00 8:00-10:00	545.1 299.8	KPRC
9	KTCL	305.9	6:30-12:00	8:00-10:00 7:50-10:10	8:00-10:00	7:00-9:00 7:25-8:25	7:00-11:00	7:00-10:00 6:30- 7:30	7:00-12:00	305.9	KSL
1	KTH8 KTW	374.8 455	7:25- 8:25 Silent	7:25 - 8:00	7:25- 8:25 Silent	Silent	7:25- 8:25 Silent	7:25- 8:25 Silent	7:25- 8:25 Silent	374.8 455	KTHS
t	KWWG KYW	278 535.4	6:30-7:30 4:00-10:30	Silent 1:00- 2:00	Silent Silent	6:30-7:30 4:00-8:30	Silent 4:00-10:30	6:30- 7:30 4:00- 8:30	Silent 4:00-10:30	278 535.4	KWWG KYW
9	NAA PWX	434.5 400	Silent 5:30- 8:00	Silent	4:45- 5:00 Silent	4:45- 5:00 Silent	4:25- 5:40 5:30- 8:00	4:45- 5:00 Sllent	4:45- 5:00 Silent	434.5 400	NAA
1	WAHG	315.6 243.8	9:00-11:00	Silent 12:00- 8:00	4:00-10:00 Silent	Silent 8:00- 9:00	3:30- 8:00 8:00- 9:30	Silent 8:00- 9:30	4:00- 7:30 8:00- 9:00	315.6 243.8	WAHG
5	WBAP WBAR	475.9 406	8:00- 9:00 5:00- 6:00 Silent	9:00-10:00 8:00- 9:00	5:30-10:00 7:00- 8:00	8:00- 9:00 5:30- 8:45 Silent	5:30- 8:45 6:00- 7:00	5:30- 8:45 5:30-, 6:30	5:30- 8:45 Silent	475.9 406	WBAP
- 1	WBAV	293.9	Silent	Silent	5:00- 7:00	Silent	Silent	Silent	5:00- 6:00	293.9	WBAV
.	WBBM WBBR	226 272.6	5:00- 9:00 4:00- 5:00	1:00-11:00 4:00- 5:30	Silent 4:00- 5:00	5:00- 9:00 Silent	5:00- 7:00 Silent	5:00- 9:00 4:00- 5:00	5:00- 7:00 Silent	226 272.6	WBBM WBBR
-	WBCN WBZ	266 333.1	6:00-10:00 Silent	2:00- 9:00 4:00- 6:45	Silent 3:00- 6:55	6:00-10:00 3:00-6:55	5:00- 9:00 3:00- 6:55	6:00-11:00 3:00-6:55	6:00-10:00 8:00-6:55	266 333.1	WBCN
e	WCAC	275 461.3	Silent 4:30- 5:30	Silent 2:30-3:30	4:00- 6:00	Silent 4:00- 7:00	4:00- 6:00 4:30- 8:00	Silent 4:00- 7:00	4:00- 6:00	275 461.3	WCAC
s	WCAP	468.5 278	Silent	1:00- 6:15	4:00- 7:30 Silent	Silent 2:30- 8:00	4:00-7:30 2:30-7:45	Silent 2:30- 7:30	4:00 - 7:00 2:30 - 7:30	468.5 278	WCAP
-	WCC0	344.6 416.4	Silent 4:05- 9:00	6:00- 7:00 5:20- 8:15	5:00- 7:30 4:00- 7:00	Silent 4:00- 7:00	Silent 4:00-10:30	4:00- 7:00	Silent	344.6	WCBD
1	WCX	516.9 365.6	3:00- 4:00	8:00- 4:00	3:00- 6:30	3:00- 8:00	3:00-10:30 3:00-6:30 4:00-7:15	3:00- 6:30	4:00-11:00 3:00-6:30	516.9	WCC0
	WDAF WDWF WEAF	440.9	4:00-11:00 Silent	2:00- 3:30 1:00- 2:45	4:00- 7:30 Silent	4:00-11:00 4:30- 5:30	Silent	4:00-11:00 Silent	4:00- 7:30 2:00- 8:30	365.6 440.9	WDAF
1	WEAD WEAR	491.5 293.9	2:00- 8:00 Silent	3:20- 6:15 Silent	2:00- 7:30 Silent	2:00- 8:00 Silent	2:00- 8:00 5:00- 6:00	2:00- 8:00 5:00- 6:00	2:00- 8:00 Silent	491.5 293.9	WEAF
	WEBH WEBJ	389.4 370.2 272.6	4:00-12:00 4:30- 9:30 Silent	12:30- 7:00 4:00- 6:00	4:00- 5:00 Silent	4:00- 8:00 4:30- 9:30	4:00- 5:00 4:30- 9:30	4:00- 8:00 4:30- 9:30	4:00- 8:00 4:30- 9:30	389.4 370.2	WEAR
1	WEEL	475.9	Silent	Silent 3:20-6:20	Silent 4:00- 7:00	4:00- 5:00	3:00- 5:00 4:00- 7:00	Silent 4:00- 7:00	4:00- 5:00	272.6 475.9	MEEL
-	WFAA WFBH	475.9 272.6	6:30-10:00 7:30-10:00	4:30- 9:00 1:00- 4:00	4:30-7:30 7:30-10:00	4:30-10:00 7:30-10:00	Silent 7:30-10:00	4:30-10:00 7:30-10:00	4:30-7:30 7:30-10:00	475.9 272.6	WFAA WFBH
s	WFI -	394.5 252	2:00- 3:45 Silent	12:30- 4:30 3:30- 8:00	Silent 3:30- 8:00	4:00- 6:00 Silent	2:45- 3:45 3:30- 8:00	3:45- 7:00 Silent	2:45- 3:45 3:30- 8:00	394.5 252	WEL
s	WGBS WGES	315.6 250	2:00-8:00 7:30-11:00	5:30-6:30 7:30-11:00	Silent Silent	2:00- 8:00 7:30-11:00	Silent 7:30-11:00	2:00- 9:00 7:30-11:00	Silent 7:30-11:00	315.6 250	WGBS
3	WGN WGR	370.2 319	3:30- 8:30 4:45- 6:15	6:00-7:00 11:00-12:00	Silent 4:00- 9:00	3:30- 8:30 4:00- 7:00	3:30-8:30 4:00-9:00	3:30- 8:30 4:00- 7:00	3:30- 8:30 3:00- 9:00		WGN
2	WHAD	379.5 275	6:00- 9:00	3:30- 8:00	3:30- 5:30	4:10- 8:00	Silent	3:45- 8:30	4:15- 7:30	379.5	WGY
f	WHAR	275 399.8	4:00- 5:00 3:30- 6:00	5:00- 8:00	4:00- 8:00 3:30- 5:00	4:00- 5:00 3:30- 8:00	4:00-10:80 Silent	4:00- 5:00 3:30-6:00	4:00- 6:30 3:30- 8:00	275	WHAD
y	WHAZ	379.5	5:30- 7:00 Silent	2:00- 3:00 Silent	Silent 6:00- 8:00	5:30- 7:30 Silent	5:30- 7:00 Silent	5:30- 7:00 Silent	5:30- 7:00 Silent	399.8	WHAZ
s -	WHB WHN	365.6	Silent 3:30- 6:00	6:00-11:00 3:30- 8:00	5:00- 6:00 3:30- 8:00	Silent 3:30- 8:00	5:00- 6:00 3:30- 7:00	6:00- 8:30 3:30- 8:00	5:00- 6:00 3:30- 8:00	365.6	WHB
v -	WHO	526 399.4	Silent 4:00-10:00	5:30- 6:30 9:00- 7:30	5:30-10:00 4:00-10:00	5:30- 7:00 4:00-10:00	4:30 - 9:30 4:00-10:00	5:30-10:00 4:00-10:00	5:30-10:00 4:00-10:00	526 399.4	WHO
s	WIB0 WIP	226 508.2	8:00- 5:00 4:00- 8:05	3:00- 9:00 Stlent	Silent	3:00-12:00 4:00- 9:00	3:00- 9:00 Silent	3:00-12:00 4:30-9:00	3:00-11:00 Silent	226 508.2	WIBO
e	WJAR	305.9 275.3	Silent 3:00- 8:00	3:20- 6:15 Silent	4:00- 6:00 3:00- 8:00	4:30- 7:00 3:00- 8:00	3:30- 4:30	4:00- 7:00 3:00- 8:00	4:00- 8:00		
e	AIIA	302.8 405.2	3:45-10:00 Silent	5:45- 7:00 4:15- 5:15	3:45-10:00	3:45-10:00	3:00- 8:00 3:45- 7:00 Silent	Silent 4:30-6:00	3:00- 8:00 3:30- 7:00	302.8	WIJD
t	WIZ	454.3 340.7	3:00- 7:30 Silent	4:00- 7:00 4:00- 6:00	Silent 4:15- 5:15	4:30- 7:15 4:10- 7:30	5:30- 7:30	4:30-7:30	4:45- 5:45 4:15- 6:45	454.8	WJZ
5	WKAR	285.5 326	9:30-11:00 7:00- 9:00	Silent 3:45- 8:00	Silent Silent 5:00-7:00	Silent Silent	4:00- 6:00 5:00- 6:15 5:00- 7:00	Silent	Silent	285.3	WKAR
e	WLBL	278 394.5	9:59-10:59	Silent Silent	Silent 3:30- 7:00	7:00- 9:00 6:00- 7:00	Silent	Silent 6:00- 7:00	Silent Silent	326 278	WLBL
-	WLS WLW	344.6 422.3	3:30-4:30 4:45-10:00 3:00-5:00	4:30- 5:55 3:30- 5:30	Silent	Silent 4:00-10:00	3:30 - 7:00 4:00 - 8:30	Silent 4:00- 5:55 4:00- 9:15	3:30- 7:00 4:00- 8:30	344.6	WLIT
	WMAK				6:00- 7:30	4:00- 7:00	4:00- 8:00		Silent	422.3	-
	WMAQ	447.5	Silent 5:00- 7:00 4:00- 7:30	Silent Silent	5:30- 7:15 Silent	Silent 5:00- 7:15 4:00- 7:30	Silent 5:00- 6:45 4:00- 7:30	8:00- 9:00 5:00- 7:15	Silent 5:00- 7:15 4:00- 7:3	265.4 447.5	WMAQ
3	WMBF WMC	384.4	3:30- 9:00	4:00- 7:30 3:30- 9:00	Silent 3:30- 9:00 5:30- 7:30	3:30-9:00	3:30- 9:00	3:30- 9:00	3:30- 9:00	384,4	WMBF
11	WMCA WNAC	499.7 340.7	5:30- 7:30 2:30- 8:00	Silent 3:00- 3:30	2:30- 8:00	5:30-10:00 2:30- 8:00	Silent /2:30- 8:00 4:00- 6:00	5:30- 7:30 2:30- 8:00	5:30-10:00 2:30-8:0	499.7	WMCA
ea	WNYC	526	4:00- 6:00 2:30- 6:20	11:00- 5:30 5:00- 7:00	4:00-6:00 3:00-7:00	4:00- 6:00 3:20- 6:20	3:30-6:30	Silent	4:00- 6:00 3:30- 6:20	280.2	WNAC
h	WOAN	394.5 282.8	6:30- 7:30 Silent	6:00 - 8:30 7:00 - 8:00	6:30- 8:30 7:00- 8:00	6:30-8:30 7:00-8:00	6:30- 7:30 7:00- 8:00	7:30-8:30 7:98-8:00	6:30- S:30 7:00- 8:00	394.5	NOAI
£.	WOC	526 483.6	4:00-10:00 4:30-10:00	7:00- 8:00 6:00- 9:30	4:00-9:00 Silent	4:00-11:00 4:30-6:00	Silent	4:00- 8:00 4:30-10:00	4:00- 8:00 4:30- 8:00	526	WOAW
e	WOO	508.2	3:30- 4:30	12:45- 3:00	3:30- 7:30	3:30- 4:30	3:30- 7:30	3:30- 4:30	3:30- 7:30	508.2	
0	WORD	405.2 275	2:15- 8:00 5:30- 7:30	Silent 3:45- 5:00	2:15- 8:00 5:30- 6:45	2:15- 3:30 5:30- 7:00	2:15- 8:00 5:30- 7:00	2:15- 3:30 5:30- 7:00	2:15- 3:36 5:80- 7:36	405.2	WOR
e	WOS	440.9 299.8	Silent 3:00- 8:00	5:30- 6:30 5:00- 7:00	6:00- 8:00 3:00- 7:30	Silent 4:00-7:00	6:00- 8:00 Silent	Silent 3:00- 8:15	6:00- 8:00 3:00- 7:00	440.5	WOS
	WRBC	447.5 278	4:00-12:00 Silent	4:00- 7:00 5:30- 6:30	Silent 5:30-6:30	4:00-11:00 Silent	4:00-11:00 Silent	4:00-11:00 Silent	4:00-11:00 Silent	447.5	
	WRC WREO	468.5 285.5	4:00- 8:30 7:00- 8:00	Silent Silent	Silent	4:00- 9:00 5:15- 6:45	Silent	4:00- 8:00 5:15- 6:45	Silent	468.5	WRC
ni	WRW	273	6:00- 8:30	5:00- 8:30	6:00- 8:30	6:00- 8:30	6:00- 8:30	6:00- 8:30	6:00- 8:30		
e	WSA1	325.9 428.3	5:00-10:80 6:00-10:00	Silent 5:30- 7:15	7:00- 9:00 6:00-10:00	4:00- 7:00 6:00-10:00	4:00- 9:00 8:45-10:00	4:00-7:00 6:00-10:00	Silent 6:00-10:00	325.9	
<b>!</b> -	WSMB	319 483.6	4:30 - 8:30 Silent	Silent 7:00-8:00	4:30- 8:30 6:00- 7:00	4:30- 5:30 Silent	4:30- 8:30 Silent	4:30-8:30 Silent	4:30- 5:30 Silent		WSMB
0	WTAM	389.4	3:00- 9:00 5:00- 7:30	Silent 5:00- 9:00	3:00- 9:00 5:00- 7:30	Silent 5:00- 7:30	3:00-10:00 5:00-7:30		Silent	389.	WTAM
h	WTIC	348.6 352.7	Silent	Silent 3:20- 7:00	2:55- 4:00 3:00- 6:00	2:55- 5:45 3:00- 8:00	Silent	2:55- 3:00 3:00- 9:30	3:00- 5:3		WTIC
1				1.00	. 0.00 0.00	. 0.00- 6.00	lent	. 0.00- 0.30	. 0.00- 1:0		- 44 M/J

# An Evening at Home with the Listener In

(Tabular form and listings copyrighted. Reproduction is forbidden.) (FOR CENTRAL TIME) (FOR EASTERN TIME Or Cities Using Central Daylight Saving Time) Monday Met. Saturday Sunday Tuesday Wednesday | Thursday Friday | Call Silent 7:15- 8:15 Silent Silent 8:30- 9:00 5:30- 9:30 8:30-10:45 6:30- 7:30 Silent. Silent Silent Silent 9:30-12:00 Silent 8:30-9:45 6:30-7:30 Silent 7:15- 8:15 Silent Silent 7:00- 9:00 Fert Bragg, N. C. Toronto, Ont...... Calgary, Alta..... Toronto, Ont..... Edmonton, Can.... 435 Silent 356.9 Silent 434.5 12:00-2:00 356.9 Silent 516.9 11:00-1:00 410.7 6:30-10:30 Silent Silent 11:00- 1:00 Silent Silent 8:15- 9:15 Silent Silent 9:30-10:00 6:30-10:30 9:30-11:45 7:30- 8:30 5:00- 6:00 6:00- 7:00 Silent 6:30- 7:30 8:30-10:30 Silent Silent 8:30-9:30 Silent 10:00-12:00 5:30- 9:30 Silent Silent 6:30-11:30 10:30-11:45 Montreal, Que.....
Winnipeg, Man....
Moncton, Can.....
Ottawa, Ont......
Mexico City, Max CKY CNRA CNRO CYB 8:00-10:45 | Silent | S 6:30-11:30 Silent Silent 10:15-11:15 11:30-12:45 Silent
Silent
7:00-8:00
5:00-6:00
Silent
Silent
9:00-10:00
7:00-2:00 Silent Silent 10:15-11:30 8:45- 9:55 8:30-10:30 Silent 10:00-12:00 Silent Silent 9:15-10:30 7:45- 8:55 7:30- 9:30 10:00-11:30 11:00-12:30 Silent Silent | S Silent 7:45-10:30 Silent 8:45- 9:30 8:45- 9:55 8:45- 9:55 8:30-10:30 10:30-12:00 Silent Silent 9:45- 2:00 8:45-9:55 8:30-10:30 Silent Silent 8:00- 9:00 6:00- 1:00 Silent 9:00-11:00 Silent . 8:45- 1:00 8:30-10:30 Silent 10:00-12:00 9:00-11:30 9:45- 2:00 Silent 8:00-10:30 8:45- 1:00 8:45- 2:00 | Sids | 1:00 | Sids | 1:00 | Sids | 1:00 | Sids | Les Angeles, Calif.
Fayetteville, Ark.
Shenandoah, Ia.
Seattle, Wash.
Bristow. Okia.
St. Louis, Mo.
University City, Mo.
Ogden, Utah.
Hollywood, Calif.
Oakland, Calif.
Portland, Ore.
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7:30-8:50 WBBW
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Providence, R. I...
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New York, N. Y.
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Chicago, III.
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Mami Beach, Fla.
Memphis, Tenn.
New York, N. Y.
Boston, Mass.
New York, N. Y.
San Antonio, Texas.
Lawrenceburg, Tenn.
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Jefferson, City, Mo...
Atlantic City, N. J.
Chicago, III.
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Washington, D. C.
Lansing, Mich...
Tarrytown, N. Y. 6:30-7:30 5:15-9:00 8:30-10:30 Silent 6:00-11:00 7:00-3:00 Silent 7:00-11:30 10:00-11:30 9:00-11:30 6:30-7:30 5:15-6:30 8:30-10:00 Silent 7:00-10:00 7:00-2:00 Silent 7:00-12:00 8:15-9:45 9:00-11:30 5:30- 9:80 4:15- 5:30 7:30- 9:30 8:00-10:00 WDS 6:30-10:30 5:15-9:00 8:30-10:00 9:00-11:00 Silent 7:00-2:00 Silent Stlent 2:45- 5:00 Silent 5:30- 6:30 4:15- 5:30 7:30- 9:00 6:30-10:30 5:15- 9:00 8:30- 9:45 9:00-11:00 6:00-10:30 6:30- 7:30 5:15- 6:30 8:30-10:00 5:30- 6:30 508.2 3:45- 6:00 8:00-10:00 Silent 6:00- 1:00 Silent Silent Silent Silent 7:39- 9:00 Silent 5:00-10:15 6:00- 1:00 Silent 6:00-10:00 7:15- 8:45 8:00-10:30 8:00-10:00 5:00- 9:30 Silent 7:30- 8:30 Silent 6:00-11:15 7:00- 2:00 Silent 7:00-11:00 8:15- 9:45 9:00-11:30 Silent 9:00-11:30 7:00-10:30 8:00-10:30 8:00-10:30 9:00-11:30 WSAI WSB WSMB Silent 8:00-12:00 WSAI 6:30-7:30 WSB WSMB 2:00- 3:00 7:30- 9:15 Silent 9:60 11:00 8:00-12:00 6:30-10:30 8:00- 9:00 5:00-11:00 7:00- 9:30 4:55-:6:00 5:00- 8:00 6:00-11:00 10:45-12:00 6:30-10:30 | Silent | WSAI | Mason, 0 | Mason, 6a | M 325.9 428.3 319 483.6 389.4 502.8 8:00-1:30 9:00-1:00 7:30-11:30 Silent 6:00-12:00 8:00-10:30 6:00- 9:00 8:00-12:00 6:30- 7:30 3:00- 4:00 8:30-10:15 Silent 8:00-11:00 Silent 10:00-12:00 9:00-1:00 7:30-11:30 8:30-10:00 6:00-12:00 7:00-10:00 9:00-1:00 7:30-8:30 7:00-12:00 11:45- 1:00 7:30-11:30 Silent WSAI 8:00-12:00 6:30-10:30 8:00-12:00 6:30-10:30 9:00- 1:00 7:30- 8:30 9:00- 1:00 7:30-11:30 9:00-10:00 5:00- 6:00 7:00- 9:80 4:55- 7:45 5:00- 8:00 Silent 5:00-12:00 7:00-9:30 Silent 5:00-10:00 5:00- 6:00 7:00-11:00 4:55- 6:00 5:00-11:30 Silent 6:00-7:00 8:00-10:30 5:55-8:45 6:00-9:00 Silent 6:00-.1:00 8:00-10:30 Silent 6:00-11:00 Silent 7:00-11:00 Silent 8:00-12:00 Silent 6:20-10:00

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Vol. XIV

#### Speaking of Mail

ALTHOUGH the postman has so far failed to bring letters from broadcasting stations, our recent editorial entitled "Now to Scold Stations" seemed to be a go-getter for fan comment. Readers will recall that the editorial advised dilatory stations that it was their duty to acknowledge in some fashion every applause card mailed to them by admiring fans. Opinions seem to differ, but still the majority of letters from readers support the contentions of the criticism. All of which goes to show that you can't please everybody. One disagreeing listener proclaims the editorial the

criticism. All of which goes to show that you can't please everybody.

One disagreeing listener proclaims the editorial the "bunk" and thinks that stations do enough when they send out the programs free of charge. He advises stations to save the postage and put the savings to good use in improving programs. However, it seems that the worst offending stations neither have good programs or acknowledge fan applause. What are they doing with their "savings"?

Members of the listening audience who liked the thought expressed were very enthusiastic and several listed stations to whom they thought marked copies will find their way to the dilatory stations to convince them that something should be done.

One large hotel never acknowledges fan mail. Of all concerns broadcasting, a hotel, catering to the tourist trade as this one does, should take great care to leave a good taste in the mouths of its listeners, especially those so loyal as to put their admiration on record.

We wonder how fan-guests wishing to see this

where the words are the plant, where the transmitting set in action, the transmitting set in action, the plant, where the transmitting set in action, the antenna system? We happen to know that no one does. After expending a large sum of money to broadcast, this famous hotel fails to cash in on the good will created. Besides hotels, many other business establishments will find it worth many future dollars to keep the good will of their listening audiences. The unappreciative station should know that listeners soon become tired of such treatment and say, as one reader has expressed it, "to h— with such stations."

#### Censorship in Manitoba

Censorship in Manitoba

WHILE rigid censorship of broadcast speeches is being exercised in the United States and Great Britain, it is interesting to note how the problem of censorship in being tackled in the Province of Manitoba, Canada, where the one broadcasting station is owned by the people of the Province and is operated by the provincial government telephone system.

Weekly church services are broadcast free of charge, except in special cases where two or more churches demand the same date. Then the matter is regarded as an ordinary business proposition and a small charge is made to whichever church secures the date. In undertaking to broadcast church services, CKY stipulates that they shall be of a strictly religious and non-political nature. If this regulation is broken by the introduction of politics into the sermon, then the full rate for a political meeting is applied.

CKY broadcasts speeches on political and other controversial subjects at a regular and non-prohibitive fee and without the exercise of any censorship whatever, drawing the line only at sedition, blasphemy or indecency. It has never yet been necessary to terminate a broadcast on account of an attempt to broadcast anything of such a serious nature, nor is it thought likely that this will ever have to be done, as it is found generally that people who are willing to pay a fee for broadcasting are anxious to gain the good will of the greatest possible number of listeners.

The British Broadcasting company recently refused to broadcast prohibition speeches, CKY has broadcast by prohibition and anti-prohibition speeches without suffering criticism. It is interesting to hear a provincial government station broadcasting anti-government propaganda, but CKY frequently does so (at so much per minute, of course).

#### RADIO INDI-GEST

#### Tin Cup Race Neck 'n Neck



Prace Neck in Neck
The sixteen involuntary contestants in the infamous Indi-Gest Solid
Tin Cup Worst Announcer's contest
are now coming down the stretch
on each other's neck. In fact it
looks like a necking contest. Insomuch as all the contestants are
well known we will list them by
characteristics rather than by
name.

well known we will list them by characteristics rather than by name.

To the left is pictured the replated Tin Cup which will be shipped by freight to the winner. He tells the world how good he is. 16,000 He cracks wise ones and laughs himself. 15,000 He cracks wise ones and laughs himself. 15,000 He clears his throat with the mike open 13,000 He "dead-e-cates" numbers. 12,000 He reads telegrams complimenting himself. 11,000 He mispronounces his city's name. 9,000 He calls sopranos contraltos. 8,000 He calls sopranos contraltos. 8,000 He rattles papers in front of the mike. 7,000 He says "or-KESS-tra" 6,000 He courts his girl via Radio. 5,000 He thinks jazz is lowbrow. 4,000 He thinks Grand Opera highbrow. 3,000 He asks for fan letters. 2,000 He says "well, well, folks, the next, etc." 1,000

#### A Syitch in Time, Etc.

Says a contemporary weekly:

"One of the most valuable accessories to a tube set is a syitch by means of which the batteries may be readily connected and disconceted."

Then, too, we have heard that some of the most useful parts of receivers are gadgets, dofunnies, thingamagigs and whatchemaycallits.

The Radio Bug

The Radio Bug is a very strange sight.
The best time to see one is quite late at night.
It sits in a corner and makes not a sound,
But humps up its back like a mole in the ground.

Its ear is developed as large as a plate, Its sitting down part is as wide as a gate; It says very little but hears quite a lot, But for things that are local it cares not a jot.

Its language is simple—it has but one word. If you make the least sound it is then to be heard: "Hush," it says and repeats it again and again, Then sinks into silence as dense as a Dane.

A statue of patience—the Radio Bug, As still as an old sleeping dog on a rug; It twiddles the knobs on the Radio set Still trying another new station to get.

But even at that the Radio Bug does not have to cultivate a vocabulary as does the Golf Nut.

# Music Trust Originality, or Inspired for a Copyright

or Inspired for a Copyright
(Play in One Short Act)

Scene: Studio of KNX
Time: 6:45 p. m.
Characters: Town Crier, announcer of KNX and Peul
Finstein, leader of Atwater Kent dinner hour orchestra.
Town Crier: "What's your next number, Paul?"
Finstein: "Well, we have about two hundred requests for Moonlight and Roses."
Town Crier: "That's out! You know our contract provides no jazz or dance musto on this hour."
Finstein: "All right. Well play Andantino in \D flat." (Selection is then played.)
Town Crier: "That's out! you were going to play Andantino in \D flat and you were going to play Andantino in \D flat and you played Moonlight and Roses. How come?"
Finstein: "We did play the Andantino. Don't you know the Andantino is an old English number written years and years ago for the organ and that it has been lifted bodily and arranged in fox trot time as a dance number?"
And another announcer passed out. K. N. EXXER.

And another announcer passed out.

There are about 200 more acts to this drama but insomuch as they are all about the same, we say as many announcers have had to say, "Sorry, but we can't use that number here."

#### We Love Us Says Delmer

We Love Us Says Delmer

By Delmer Buglass

Pelmer Buglass

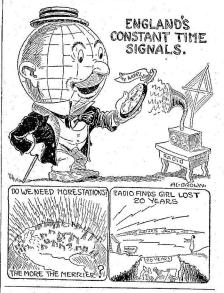
Pelmer Buglass

Beling only the paid critic of NWG, I can scarcely refrain from patting our station on the back. It is wonderful. All ways wonderful! All the other broadcasters in Chicago and elsewhere are somewhat or very punk. Only shades of punkness differentiate them one from the other.

While wandering about the dials yesterday I suddenly hesitated at the numbers which usually bring me the GOOD things from NWG. Why, I do not know. Why should I stoop to dial in NWG? I believe it was because I am always assured of the best on the air at that dial setting. (And, of course, my boss would get sore and fire me if I didn't say swell things about our station.)

What, little kiddies, do you suppose I found? No-sir-ee, ugh, ugh, I heard the jungles of Tennessee on the air, and a lot of monkeys were discoursing on their improbable (they hoped) relationship with man. And the big black monkey said to the flerce ape, "Have you ever met Bill Jones?", and the ape said to the big black monkey, "No, what's his name?, and the big black monkey said to the flerce ape, "Have you ever met Bill Jones?", and the ape said to the big black monkey said to the flerce ape, "Have you ever met Bill Jones?", and the ape said to the big black monkey. "No, what's his name?, and the big black monkey said to the flerce ape, "Have you ever met Bill Jones?", and the ape said to the big black monkey. "No, what's his name?, and the big black monkey said to the flerce ape, "Have you ever met Bill Jones?", and the ape said to the big black monkey. "No, what's his name?, and the big black monkey said to the flerce ape, and the ape said to the big black monkey." And maybe I'll take a masty crack at WIAS or, perhaps, WBBM. Won't that be fun?

#### News of the Week



#### Condensed BY DIELECTRIC

When you have no other means of visiting a coast resort it is well to try a Radio trip—the cost is little and imagination does a heap. I traveled to Atlantic City the other night via WPG. Just after my dials came to a stop at that broadcasting station the Ambassador hotel orchestra began a program which held one's attention during the entire feature. Tschaikowski wrote but one piece of chamber music that endures to this day, the andante of which is a beautiful selection. You must admire the violinist, not alone for his ability, but for the responsiveness of the instrument he owns. His work was splendid.

We are back again with the concerts broadcast through several stations and rendered by the New York Philharmonic orchestra, one of the foremost in the country. It is a misfortune, however, to have such music delegated to WJZ in New York for transmission to music lovers in that territory. Other stations could more efficiently do this. And to think how some feared for the success of sending out classical music on this order. Fortunately those days of skepticism have passed from us.

WEAR, Cleveland, may have received several commendatory references in these columns for the style of organ recitals broadcast. They are likely to receive more—unless the organist becomes careless. Few compositions are so well suited to varied instruentation as the famous New World symphony of Dvorak, the andante movement of which is exquisite however often it is heard. That andante was sufficient for the entire evening's enjoyment as played in Cleveland and carried through the ether.

Not in some time has Dielectric tuned to the dinner hour concert given by Station WTAM, Cleveland. This has not been due to lack of enjoyment of the feature, as assurance is hastily given. I don't imagine Radio listeners, once hearing this feature, miss an opportunity for repetition. How many dinner hour concerts are regularly tuned in? This would be interesting, if known. Presumably we are to be entertained while enjoying our simple repasts by orchestras entertaining diners spending many pieces of eight for the same musical relish. Do we? Try WTAM.

Station WLIT, Philadelphia, has one regular feature of rather general interest—the Stanley theater concerts. These differ not at all from other theatrical programs, except, perhaps, in a degree of excellence (this one not being at the top). On my last listen in to this feature, soloists were heard whose excellence many would question. The instrumental trio is another story altogether. They were happy in choice of selections and mindful of each other's presence. When a trio becomes a soloist with two accompanying, it is no longer a trio—properly. We thank WLIT for giving us Stanley T-R-I-O, with no "line busy."

Col. Green has done much for Radiophony with no other motive in mind than to please himself and provide pleasure for the rest of us. Experimentation is not yet at an end at WMAF, South Dartmouth, Mass, and, it is to be hoped, will not be for many a year. If you have not attempted to reach this station, by all means do so. The programs are mainly retransmissions—but such transmission! Anyone appreciating piano music will find here cause for rejoicing for the modulation is almost perfection. Let's see how many of you agree with me.

# Radio Inductive Interference and Its Cure

Part I—Sources of Trouble and Identifying Clues

By Radio Branch, Dept. Marine and Fisheries, Canada



travel along the supply wires of the secondary distribution system and cause Radio interference to all receivers near these wires. This interference is very staccato in character and consists of a regular series of clicks corresponding to the frequency of the alternating current supplying the charger.

Commutator motors which in some cases cause Radio interference due to sparking of the brushes may often be recognized by the sound in the Radio receiver. The interference noise will rise in pitch as the motor speeds up. It is sometimes possible to identify the speed of the motor due to irregularities in the commutator. In cases of motors running at less than 200 R. P. M. It is sometimes possible to count the speed of the motor by listening to the Radio receiver and observing the second hand of a watch.

Faults of High Voltage Lines
A faulty insulator on a transmission line for 30,000 volts or more may sometimes cause an electrical surge which travels along the transmission line for many miles and causes Radio interference to receivers situated within a few hundred yards of this line. This Radio interference to receivers situated within a few hundred yards of this line. This Radio interference is usually continuous but may under some conditions, be intermittent and very erratic. The number of cases of such interference, however, is very small, as faulty insulators usually cause the shut down of the transmission line and thus will not continue.

A transmission line which sparks to some insulated conductor, such as an insulated guy wire or an ungrounded conduit, may cause Radio interference of a similar nature to that described as originating on a faulty insulator. In this case, however, the interference may continue for weeks or months without causing any power shut down, as the amount of cur-

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U. J. HERRMANN, MANAGING DIRECTOR

SEPTEMBER 14th to 19th

MONDAY NOON TO SATURDAY MIDNIGHT

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# A. B. C. Course in Radio Fundamentals

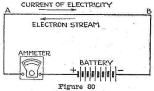
# Chapter XIX—Operation of the Electron Tube

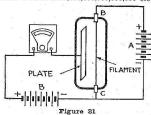
By David Penn Moreton

mis tube which and to its practical importance in many lines of scientific development.

The electron tube derives its name from the fact that the action of the tube is due to very small particles of matter called "electrons." According to the electron theory, the atoms of all substances consist of negative and positive electricity. Each atom is supposed to consist of a neucleus of positive electricity. Each atom is supposed to consist of a neucleus of positive electricity around which the negative charges or electrons are grouped, and the electricity inst neutralizes the electrical effect of the electrons, and in the normal condition the whole atom is electrically neutral. The atom cannot have any of the positive electricity removed, but in conductors the negative charges or electrons are continually getting loose from the atoms and becoming attached to other atoms. If the electrons are driven off from the conductor, it is left with an excess of positive electricity and the conductor is said to be charged positively. If, on the other hand, there is an excess of electrons on the conductor, that is the negative electrons more than neutralize the positive charges on the atoms, the conductor is said to be negatively charged. The smallest electrical charge that can exist is that of a single electron.

Guided Electrons Are Current





insually getting loose from the atoms and becoming attached to other atoms. If the electrons are driven off from the conductor, it is left with an excess of positive electricity and the conductor is said to be charged positively. If, on the other hand, there is an excess of electrons on the conductor, that is the negative electrons more than neutralize the positive charges on the atoms, the conductor is said to be negatively charged. The smallest electrical charge that can exist is that of a single electron.

Guided Electrons Are Current

A current of electricity, according to the electron six in the opposite direction to that in which the current of electricity in the opposite direction to that in which the current of electricity.

CURRENT OF ELECTRICITY

BELECTRON STREAM

BATTERY

AMMETER

BATTERY

B

If the connections of the B battery be reversed, and the plate made negative instead of positive with respect to the filament, no current will flow as the plate repels the electrons given off by the filament and tends to drive them back into the filament. If an alternating electrical pressure be connected to the plate circuit instead of the B battery, there will be a stream of electrons flowing toward the plate only when the plate is positive. It is evident that such a bulb may be used as a rectifier for alternating currents and, therefore, can be substituted for a crystal detector in a Radio receiving set. The connection of a bulb of this kind in a simple receiving set is shown in figure \$2. This device is called the Fleming valve, after the investigator who showed the application of the tube to Radio reception.

#### The Edison Effect

The Edison Effect

In the early days of the carbon filament incandescent lamp, Edison noted a phenomenon which could not be explained at that time. A metal plate was sealed inside the lamp bulb between the two sides of the filament, the plate being completely insulated from the filament itself. When the outside terminal of the plate was connected to the positive terminal of the filament through a gai-vanometer, a current was found to exist in the circuit, while if the outside terminal of the plate was connected to the negative terminal of the filament through a gai-vanometer, a current was found to exist in the circuit, while if the outside terminal of the plate was connected to the negative terminal of the filament no current could be detected. This phenomenon is generally called the "Edison Effect," but Edison made no use of his discovery. The above description of the flow of electrons between the filament and plate in an electron tube applies to a tube hav-

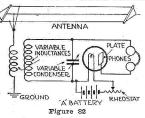


Figure 82
Thur both of the parts of the disrupted atom become carriers of electricity and contribute to the flow of current through the gas. This action of a colliding electron upon an atom is called "ionization by collision," and on account of it, relatively large plate currents are obtained in electron tubes having a poor vacuum.

High Vacuum Desirable
The earlier tubes were of this kind, but at the present time most tubes are made with a better vacuum so that ionization by collision is responsible for but a (Continued on page 20)

# 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—Sta-tions can be logged with utmost accuracy—Amazing clarity and volume!

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

Also ask to see the improved SHAMROCK-HARKNESS THREE-TUBE COUNTERFLEX

The Wonder Set \$3950

SHAMROCK MFG. CO., Dept. 36C, Market St., Newark, N. J. Please send me a copy of "Shamrock Builder's Guide Book" containing d and complete instructions for building at prices ranging from \$15 to \$50. I 10/cents (U. S. stample or coin).



\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*



Watch for the Crosley PUP!

"It's a Sky Terrier"

THE CROSLEY RADIO CORPORATION CINCINNATI, OHIO POWEL CROSLEY, Jr., President

# Heteroflex: The Reflexed Super-Heterodyne

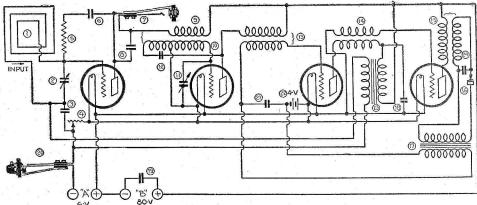
Uses Four Tubes and Crystal

By P. E. Edelman

OW comes the heteroflex receiver, a real improvement. With this outfit you don't need six or eight tubes, and the four tubes used do not drain down the B batteries. Unlike several forms of superheterodyne circuits, the heteroflex is non-radiating. It has very sharp frequency selectivity supplemented by the directional selectivity of a loop so that much interference affecting other receivers does not annoy the user of the heteroflex outfit. Four tubes are not too expensive nor difficult to keep going. The heteroflex outfit. Four tubes are not too expensive nor difficult to keep going. The heteroflex is very sensitive but controlled by two dials plus only one rheostat. Fotentiometers, etc., are omitted.

The principle or amplifying process used in the new heteroflex receiver is shown in the illustration. Figure 2 shows a diagram of the connections. The incoming Radio frequency is amplified by the first tube and passes through the second tube. This second tube comprises a local oscillator to form beats or heterogyne with the incoming frequency and the output of this tube is fixed to absorb the intermediate or beat frequency energy. This heterodyned output then passes through the third amplifying tube and is cascaded through the fourth amplifying tube at the same intermediate frequency. A fixed rectifier detector is then used to convert the intermediate frequency. ing tube at the same intermediate frequency. A fixed rectifier detector is then used to convert the intermediate frequency output to unipulsating audio current. This audio current is amplified by the third tube and cascaded to the first tube, from which the amplified audio output is obtained.

The four tubes thus afforded—one original Radio frequency amplifier, an oscillator and amplifier, two stages of inter-



The Radio output of tube 1 goes through plate coil 9 which is coupled to coil 10. Coils 9 and 10 form an air core tuned secondary Radio frequency transformer, and the secondary coil 10 is also used for the oscillator inductance of the second tube. Coil 9 may have 15 turns of number 22 dec wire wound in a layer at one end of a 3-inch fibre tube, with coil 10 insulated therefrom and continued on the same tube with 60 turns of the same

efficiently and may have a powdered iron core. Sultable transformers are on the market.

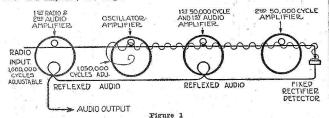
The intermediate frequency output from the third tube goes through a similar intermediate frequency transformer 14 of small dimensions and repeats into the fourth. Mica by-pass condensers are used in the grid circuits of the first and third tubes. Condenser 3 is .003 mfd. and condenser 21 is .002 mfd. A 4-volt C battery is used in the grid circuit of the third tube to prevent undesired grid current flow.

tube to prevent undesired grid current flow.

The Radio output of the fourth tube is also at the intermediate heterodyned frequency, but is put through a transformer 15 with a tuned secondary. The transformer 15 has a fixed condenser across its secondary so that the secondary is tuned closely to the intermediate frequency, in this case 50,000 cycles. If

this is not done accurately, the tuning of the heteroflex set will be much broadened because the fixed intermediate transformers pass a band of frequencies. The transformer 15 has the high side of its secondary winding connected to a fixed rectifier crystal detector 16.

It is important that the rectifier be inserted in the high potential output side, and that a good rectifier able to handle the input from the fourth tube be used. The rectified current is fed into a one to three audio transformer 17, with the secondary fed into by-pass condenser 21 in the grid circuit of the third tube. The audio output of this third tube is fed into the transformer 23. The primary of this transformer 23 is shunted around the by-pass condenser 18 of .003 mfd. capacity. Transformer 2 is shunted around the by-pass condenser 18 as a ratio of one to three and its output feeds across the (Continued on page 20)



2 and the oscillator condenser if are the second tube have a vernier dial, because the tuning and repeats it to the grid circuit of this very sharp and will be lost by rapid manipulation of condenser knob controls.

mediate Radio frequency amplification, detection, and two stages of audio amplification. Loud speaker output on distant broadcast programs is obtainable therefrom with small loop input, and local stations are easily tuned through, and cut out thereby. It is also possible to use the heteroflex with three tubes, omitting the last stage of intermediate amplification and the first reflexed audio stage, but this will reduce the performance very considerably, so that an aerial input will be required for good results.

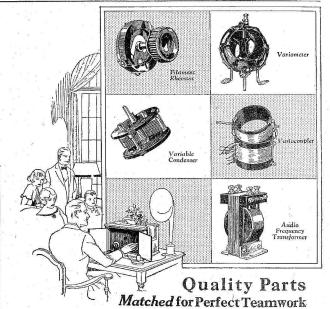
\*\*Uses a Loop\*\*

The four tube heteroflex set shown uses a loop input. The loop can have 24 turns of wire spaced ¼ inch apart, wound spiral pancake fashion, starting on a diameter of 6 inches and continuing until a total of 100 feet of number 18 copper wire is so wound. The tuning condenser:

2 and the oscillator condenser: 11 are 11 are 12 and the oscillator frequency and also approximately resonates the grid circuit for the second tube and the further tubes and the plate by mica condenser 6 is .00001 mfd. size. Condenser 11 adjusts the oscillator frequency output. The frest tube's Radio frequency output. The frest tube is made an efficient incoming Radio frequency amplifier, and the set does not readiate analysing disturbances to other receivers mearby.

Thermediate Frequency Transformer The second vacuum tube has an intermediate frequency transformer 13 in its plate output circuit. The primary of this transformer draws off the heterodyned frequency output from the second tube and requency output from the second tube and repeats it to the grid circuit of the scale and the further tubes of the plate by mica condenser 11 are 12 of .001 mfd. size. Condenser 11 adjusts the oscillator frequency and also approximately resonates the grid circuit of the scale and the turns are in the grid circuit of the scale and the turns are in the grid circuit of the scale and the second at the scale and the second tube and the first tube's Radio frequency and also approximately resonates the grid circuit of the scale and

plate output circuit. The primary of this transformer draws off the heterodyned frequency output from the second tube and repeats it to the grid circuit of the third tube. This transformer 12 may be



Your "pet" hook-up needs first quality parts-perfectly matched-to give you real radio.

Every Federal Standard Radio Part is designed, made, matched and guaranteed by Federal. That is why you find Federal parts in all the better hook-ups-that is why you should insist on Federal parts when purchasing.

FEDERAL TELEPHONE MANUFACTURING CORP.
Buffalo, N. Y.



GLASS, a base and some hunks A GLASS, a base and some many of wire—Kipling would have said about vacuum tubes. And so they are. But what a difference the method of

assembly and manufacture makes!
MAGNATRONS are built with the precision of a fine watch, and tested just as carefully before they leave the factory. You can always count on MAGNATRONS to get the most and the best out of your

Your dealer sells Magnatrons in the type 201-A, 199, and 199 large base.

CONNEWEY ELECTRIC LABORATORIES

the tremendous amplification.

Not a Complicated Circuit

The heteroflex is thus not so very complicated after all. The construction requires experienced Radio frequency assembling ability with careful testing and checking up of circuits. Good parts are essential, and there must be no short circuited windings, or by-pass condensers. It is possible to use a third stage of audio with the heteroflex but this will not be found necessary if the heteroflex is well built. It is not polley to use the heteroflex output on a headset without turning the filament rheostat down, as the output will shake the parts of a headset loose or rattle the diaphragm.

The heteroflex should not be confused with ordinary reflex or superheterodyne sets, though it does the work of both. The method is novel and obtains good output from each tube. Squeals are noticeably absent so that true reproduction may be had. The input circuit to the first tube should be calibrated with a wavemeter or against logging of well known stations. The oscillator condensers is recommended. A station found can be repeated at will with the same setting. To check up, if the Radio stages are operating. O. Et., a headset in series with a fixed rectifier can be connected successively across the secondaries of each Radio ransformer while the set is operating on some breadcast program. If you find no progressive gain in this manner, then one or more of the transformers is not operating properly or is robbed of its Radio input your property or is robbed of its Radio input to the set in series within grower or more of the transformers is not operating properly or is robbed of its Radio input your property or is robbed of its Radio input to the set is sufficient with a back base of 7 to 16 the transformers of 7 to 16 the set in the set is contacted at the sum of 7 to 16 the set is contacted and a successive of 7 to 16 the set is contacted and and the set is sufficient with a back base of 7 to 16 the set is contacted and a successive of the set is a contacted and a succes

Fanel size can be to suit, but 7 by 18 inches is sufficient with a back base of 7 by 16 inches. A beginner should not attempt the assembly without experienced assistance.

#### One Control Method

A further improvement on the heteroflex has been worked out with automatic mechanical coupling of the tuning condensers of the input and oscillator circuits, so that one control handles both circuits in correct ratio. The two dials shown are, however, within the operating ability of a novice.

circuits in correct ratio. The two dials shown are, however, within the operating ability of a novice.

The heteroflex thus affords also necessary Radio, intermediate, and audio frequency amplification in a practical four tube self contained unit.

The heteroflex is thus a considerable improvement on the old heterodyne amplifier of Fessenden and the several so-called superheterodyne circuits using six to ten tubes as worked out by others. As compared to other reflex sets, the heteroflex utilizes more efficient amplification for a similar number of tubes. The advantage is from the heterodyne amplification and permits the use of a rugged fixed rectifier detector. You do not need to use more than four tubes. When the heteroflex method is employed, that is enough.

The heteroflex can be used with aerial input, but very loose coupling is desirable if this is done, a disadvantage results from the interference picked up by an aerial. A practical point to keep in mindregarding sensitive sets such as the heteroflex is that in reaching out for great distances, you also reach out for interferences which have not any noticeable effect on a less sensitive receiver. The loop input thus becomes almost an assential, as it receives interferences only from the same general directions that the signals are coming from; not from all directions, as in the case of an aerial.

(Some juggling of fixed capacities and grid bias will be found desirable. Filter

(Some juggling of fixed capacities and grid bias will be found desirable. Filter may be at input or output of the intermediate stages and individual rheostats are a help. The technical staff successfully built one of these sets, so the reader can proceed with the knowledge that Reteroflex is a practical reality.—Editor's Note.)

#### A. B. C. RADIO COURSE

(Continued from page 18) small part of the current flow. Ionization by collision might appear to be an ad-

HETEROFLEX RECEIVER (Continued from page 19)
condenser 3 in the grid circuit of the first tube. Rheostat 4 is 15 ohms size and it controls all tubes. Tubes used are UV-201A. It is possible to use UV-199 tubes in the sockets shown for the second, third and fourth if suitable provisions are made the three time therefor, with an additional rheostat.

Four A tubes only require 1 ampere operating current, or one A tube with three 199s requires less than ½ ampere filament current. The by-pass condenser 19 is a mica one having 1 mfd. capacity, the switch 20, turns on and off to operate the set. A B battery supplying 80 voits is required. Volume control is had by turning down rheostat 4 or turning loop 1 partly out of line with the nearby broadcasting stations, thus reducing all the Radio and intermediate amplification.

Mot a Complicated Circuit

The heteroflex is turned down. This turning down is necessary on account of the tremendous amplification.

Not a Complicated Circuit

The heteroflex is turned down. The characteristic of the construction requires experienced Radio frequency assembling ability with careful testing and checking up of circuits. Good parts are essential, and there must be no short circuited windings, or by-pass condensers. It is possible to use a thrd stage of audio with the heteroflex is the heteroflex is the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is will not be found necessary if the heteroflex is

#### **INDUCTIVE TROUBLES**

(Continued from page 17)

rent flowing is only sufficient to charge the ungrounded metal and not sufficient to indicate at the power house. In case such a fault is caused by a line swinging into contact with a guy wire, it is usually noticed to be intermittent during windy weather.

weather.

Faults on Transformers

Interference which is caused by defective insulation in conduit or in electrical apparatus, is sometimes intermittent and

Interference which is caused by defective insulation in conduit or in electrical apparatus, is sometimes intermittent and comes on when the apparatus is vibrated or subjected to strain by expansion due to a change of temperature. For example: A faulty bushing on the primary of the transformer may cause Radio interference by sparking to the ungrounded frame of the transformer when the transformer is subjected to vibration by the passing of a truck along the road.

Charging of lightning arresters is heard in the Radio receiver as a very loud roar, but only lasts for a few seconds. Sometimes this is repeated a number of times as a series of lightning arresters are charged at one station. Most powor companies charge their arresters at times outside the broadcasting period, such as noon or 2 or 3 o'clock in the morning. The interference from lightning arresters may be heard for many miles from the source.

Cottrell precipitators sometimes cause interference which may be heard at a distance of 15 miles, but when proper means are taken to reduce this interference at its source they cannot be heard at a distance of more than one mile.

Freliminary Tests to Make

First Test: To determine if the noise in the receiver is due to a fault in your receiver or is actually interference coming in on the air.

Disconnect your aerial and ground wires. If there is no reduction in the intensity of the noise while the broadcast music is stopped by the disconnection, the probability is that the source of the noise is in your own receiving set, in the form of a loose connection, faulty batteries, or defective tube.

Shake your ground wire near the ground connection to make sure that the noise you hear is not caused by a bad connection at this point.

Second Test: To determine whether the interference originates in your own houselighting circuit.

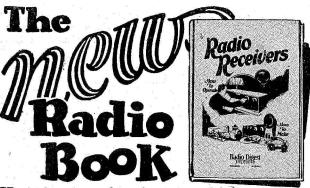
From cases of interference investigated it has been found that a great number of these are of a purely local nature, originating in such sources as a lamp loose in its socket, or a loose plug

its socket, or a loose plug of a heater, or from faulty household apparatus. While the interference is continuous, open or from faulty household apparatus. While the interference is continuous, open your main house-lighting switch for a few seconds at the same time listening in or the receiver. If the interference stops when the switch is open, the source of the interference is probably in your own circuit. This test should be repeated several times, however, as there may have been a misleading coincidence with something occurring outside at the instant this switch was opened. Many sources of interference do not start again immediately as the switch is closed, so that observations taken at the instant of opening the switch are more reliable than those taken at the instant of closing it.

Third Test: To determine the extent of the area affected by this interference.

When you are assured that the interference comes in on the air and does not originate in your own set or in your own house-lighting circuit, you should communicate with others in your district who have Radio receivers. Great care should have Radio receivers. Great care should

(Continued on page 21)



How to a understand radio, assemble circuits, improve reception, operate sets.

VERY phase of Radio reception gathered into one book at a last! Explanation of elementary principles, directions for constructing parts, detailed how-to-build articles for the assembly of sets, operating directions on popular manufactured outfits.

Haven't you often wondered what all the spirals, wriggly lines and zig-zag lines were about on diagrams? A big chart shows you a picture of the part as you see it and, beside the picture, the symbol used in diagrams. Other articles show clearly just what happens within the mysterious little vacuum tubes that glow hour after hour within your set, apparently without change, yet pass every note of a jazz orchestra or soprano.

Antennas, for whose erection there are seemingly no rules, are covered fully; the reason for a long wire in some locations and a short one in others, is readily grasped by anyone. Crystal sets, one tubers, two tube reflexes, three tube regenerative and reflex outfits, four tube R. F. and neutrodynes, five tube assemblies all types are presented up to the nine tube "super," king of the air.

#### For the Man That Bought His Set

For the non-technically inclined there is a two-color broadcast map of the country, operating schedules of all the leading stations, call letters and power rating of every station on the air. suggestions for the care of batteries and tubes.

No matter what type of receiver you own, there are dozens of valuable suggestions on tuning, trouble shooting and operating. Your head receivers, loud speaker, antenna and certain parts within the set, require frequent cleaning, adjusting and care. Interference and its remedies are factors you should understand even though you care nothing about "what makes it go."

Compiled by the technical staff of Radio Digest, it represents the high lights of the past twelve months in the Radio field. All this data is indexed for ready reference and logically arranged. Only a few thousand have been printed and this offer will stand for a limited time. The only book of its kind and is FREE with one year's subscription to Radio Digest. This offer good only on subscriptions sent directly to this office, not through agents or agencies.

Subscription Department

## Radio Digest

510 N. Dearborn St., Chicago, Ill.

Enclosed is \$5.00 in ( ) M. O., ( ) Chee ( ) Currency, for which enter my subscriptic to Radio Digest for one year and send me toom. Made Receiver. This ofter only good of subscriptions and directly to this office.  Address	Radio	Digest	8-1-20
0	book, "F	Digest for one year	r and send me the
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# How to Construct Low Loss Tuner

#### Regenerative Coupler Proves Very Efficient

With the coming of low loss sets I built the tuner described below. It has been in use about seven months and I think it is better than any ready built tuner. It is made of a piece of hard rubber or bakelite

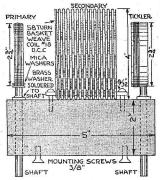
#### WORKSHOP KINKS EARN A DOLLAR-

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 detalls, including stamped envelope, so rejected copy may be returned. The work must be entirely original, not copied.

RADIO KINKS DEPARTMENT Radio Digest,
510 North Dearborn St., Chicago

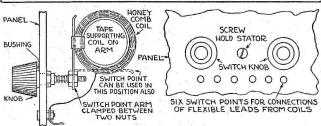
2" x 5" x 1". In this, %" from each end, you drill two \( \frac{1}{2} \)" holes for the shafts and \( \frac{1}{2} \)" from these you drill two holes using a number 29 drill; then tap these with an \$9/32 tap. On the opposite edge you drill two more holes using a number 29 drill; one is \( \frac{3}{2} \)" from shaft hole and the other is 1\( \frac{1}{2} \)" from the other shaft hole.

Next make the shafts. These are two pieces of '4" brass or rubber rod. Rubber is best, 3½" in length. Drill and tap one



end of these for an \$/32" screw. Then, if brass was used, solder a brass washer 5% of an inch from the tapped end. This is to take out end play. Now make a primary of five turns of number 18 dec. by just winding a coil in hand about 2% in diameter and tying with thread to hold together. This makes a self supporting coil. Then construct a basket weave coil of one of the many designs described in Radio Digest. The tickler is a %" length of bakelite tube 2%" in diameter. Wind, on one side of this, 15 turns of number 26 dcc. wire and then drill a hole that will pass an 8/32 screw on opposite edge from

#### BACK PANEL HONEYCOMB MOUNTING



Here are sketches of a Radio kink for the kind of coils. Any type may be used, panel mounting three honeycomb coils where a variable coupling is desired, and which require only three switch point dials, which any fan always has lying alternative and does not require any extras to mount.

These dials can be spaced according to

wire and fasten to one shaft with a machine screw.

Fasten the primary to the other shaft by spreading the wire and insulating with 2 mica washers and then insert both shafts in piece of rubber. Now fasten secondary to rubber by machine screws tightening to support by a rubber strip running through coil. Now it is ready to mount on panel; mount in any desired position and then cut two felt washers and alip on shafts that project through panel and put on dials. In making connections to this unit use pigtail wire with spashett or rubber covering.—Forrest Bryant, Minneapolis, Minn.

suitable. Great accuracy is required in these tests for it has been found that many misleading reports have been received from observers where her observers when the sessociated with the switched on every evening about dusk. If the observer in this case had noted the time very accurately, the source of the interference could have been located much more readily.

Fifth Test: To determine where the interference radiates from, by means of a

#### INDUCTIVE TROUBLES

(Continued from page 20)

(Continued from page 20)
be taken in making this test to avoid the danger of confusing the interference which originates from different sources, which may appear similar in the receiver. The most satisfactory way of making this test is for one observer to listen to the interference received on two Radio receivers at different points at the same time by means of a telephone system. To carry out this test an assistant at the distant Radio receiver should place his head phone (or preferably his loud speaker) near the transmitter of the telephone in order that the observer at the other receiver may listen at the same time to the interference heard on his own receiver at his right ear, while listening to the interference heard at the distant Radio receiver by means of the telephone to his left ear. This test should be continued for a sufficient length of time to observe a number of variations in the nature of the interference.

In cases where it is not convenient to see the fearbone system for this fest.

In the interference.

In cases where it is not convenient to use the telephone system for this test, the two observers at distant Radio receivers may keep an accurate log of the interference, but in this case they should first synchronize their watches and record any characteristic change in the interference heard, noting the time accurately to within a few seconds.

Fourth Test: To determine if any suspected source actually causes Radio interference.

In carrying out this test either of the two systems referred to in test No. 3 is

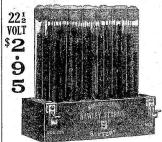
Fifth Test: To determine where the interference radiates from, by means of a portable Radio receiver.

In cases where a portable receiver is available the source of interference may be very often traced by this means. In cases where the noise is of such a weak nature that it only interferes with the reception of distant broadcast signals, a very sensitive loop receiver is required to pick this up. A portable super-heterodyne receiver complete with batteries and thoroughly shielded is best for this pur-

pose. A much less sensitive receiver however, be used in connection with the loop which will be suitable for determin-ing the conductors from which the inter-ference radiates. In cases where the inference radiates. In cases where the interference is coming in along the conductors of the electric light or power system, a single circuit regenerative receiver having two stages of audio frequency amplification is sufficiently sensitive to give indication when the loop of the receiver is placed within a few yards of the conductor radiating the interference. The construction of a satisfactory trouble shooting set will be presented in a future article.

(In the next article, various methods of correcting interference are explained by the department of marine and fisheries, and photos are shown of their transmis-sion line leakage finding receiver.—Edi-

Don't guess-use a voltmeter on your



# The "Goode" Two-o-One





QUARTER AMPERE

#### RADIO TUBE

GUARANTEED SATISFACTORY

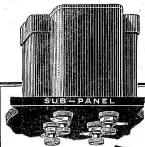
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SUB-PANEL MOUNTING TYPE

They permit a neater assembly, shortening of leads and concealing of wiring—as in factory built sets. Same ratios—same prices—as standard type Thordarsons. Order direct if dealer cannot supply.

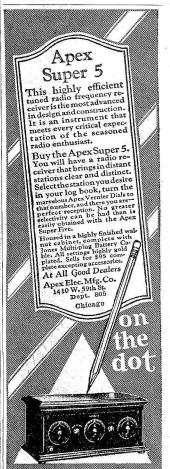
Makers of sets costing up to hundreds of dollars each are mighty particular to use only the best transformer than the particular to the pa

TYPES and PRICES Thordarson "Super" Audio Frequency Transformers are to be had in three ratios: 2-1, \$5; 3½-1, \$4; 6-1, \$450. Thordarson Power Amplifying Transformers are \$13 the pair. Thordarson Interstage Power Amplifying Transformers, \$8. AMPLIFYING TRANSFORMERS

Standard on the majority of quality sets Write for free hook-up bulletins.

THORDARSON ELECTRIC MANUFACTURING CO. WORLD'S OLDEST AND LARGEST EXCLUSIVE TRANSFORMER MAKERS

Chicago, U.S.A.



# **Questions and Answers**

Transmitting Information

Transmitting Information
(14028) AML, Wilmore, Ky.
If possible for you to do so, would like for you to give me some information on the following: Average cost of 10-watt transmitting station?
Also the distance these stations could be heard. Where could I get the above equipment complete or knockdown? Would also like to Know just what proceedings to go through with to get amateur license from the government.

from the government.

A.—In your letter you ask how far the two stations mentioned could be heard. A 10-watt station might be heard occasionally at 1,000 miles, but its dependable range over which it could be heard about 95 per cent of the time would be 10 miles. A 50-watt station might be heard frequently at 2,500 miles, but its dependable range over which communication could be dependably accomplished would not be more than 50 miles. The dependable transmission runs just about one mile per watt as you will note from the above figures.

figures. The only concerns who can legally sell you a complete transmitter are the Radio Corporation of America and the Western Electric company. With the exception of broadcasting stations of the 500-watt and 1,500-wat classes all of the transmitters in this country in amateur use or broadcasting use are made by the users from individual parts which can be purchased from various concerns. If you are Interested in transmitting, we refer you to the publication known as QST, which is published by the American Radio Relay league of Hartford, Conn. That magazine and that organization are devoted exclusively to amateur transmisvoted exclusively to amateur transmis-sion both in code and in voice.

To Tune Above 360 Meters

To Tune Above 360 Meters

(13976) NS, Hutchinson, Kan.

A neighbor has a new five-tube set which refuses to "pero" above 360 to 375 meters. It works nicely below 360 about 40 to 45 on dials and the detector action (the hiss heard upon turning up the detector rheostat) seems to be just the same on the higher dial settings, as it is on the lower wave lengths. For some reason nothing will come through, not even static. This set has two pleces of apparatus which are apparently neutrodons such as are used in the Hazeltine circuits. These are scaled with some sort of wax (dropped on while hot) so of course cannot be moved. Could the trouble be in these? The set does not how on any setting. The aerial is about 115 feet long and ground O. K. Was wondering if a few more turns of wire put on the primary of the first neutroformer (and perhaps on the other too) would help the higher wave lengths.

A.—The problem of all tuned radio frequency outfits is to secure maximum amplification with a little regeneration at all wave lengths. Most of them will do

REDUCES STATIC The CRYSTECTOR Increases Clearness and Furity of Tone
Fits in standard socket in place of detector tube in Neutrodyne and R.F. sets. No change in wiring.

Price \$4.00

ioney Back Guarantee. Write for descriptive circular American Radio Sales Co., Not Inc. 3982 Barry Ave. Chicago, III.

,ook adiotron

this on the lower wave lengths, but the regeneration is less above 360 meters.

The — Five is evidently subject to this same difficulty and your suggestion of adding a few more turns to the primaries of the R. F. transformers is a good one. This will have to be done very carefully however and there will have to be a switch by means of which these added turns can be cut out when reception is desired on the lower wave lengths which would render the someone has changed the setting of this reception is desired on the lower wave lengths which would render the someone has changed the setting of this climinated when tuning below 360 meters.

The little condensers which you believe are not trodons have a lot to do with this and it is on their settings that the regeneration is determined. We are not connection. We would suggest to regeneration is determined. We are not connection is described to use this device by Prof. Hazeltine and we are inclined to believe that they are infringing on some patents.

Independent of the work of the condense of the fact that the presence of the fact that the presence of the fact that the prompany was licensed to use this device by Prof. Hazeltine and we are inclined to believe that they are infringing on some patents.

In the lower wave lengths, but the regeneration is determined. We are not contact with all of the pin in your content of the door spring in your antenna between the insulators of that it is between the insulators of the tit it is pring should be shifted to the other side of the lower would appear to a long rest of 15 hours to several days feet. As to a book in which as to a book in which you can paste they will a dark a chance to recuperate. At the station stamps we wish to a book in which you can paste they will a dark a chance to recuperate. At the station stamps we wish to abook in which you can paste they will a langth a chance the ridge and the station stamps we wish to abook in which you can paste they will a langth a chance the ridge of the calculation of the stati

Test Your Batteries Again

Test Your Batteries Again

(14050) PM, Codell, Kan.

I have a five-tube neutrodyne set, and up to recently it has worked, but upon tuning in some time ago I found I was unable to get anything. Have tested the batteries, antenna, ground and lead in wire but cannot find anything wrong. Have one Cunningham C-300 detector tube and four Cunningham C-301 amplifier tubes and they all light up and are apparently all right. Have also tried another head set which I know to be all right but can't get a sound, only the sound of battery current. Can you tell me what is wrong with the set? Is it probable that the transformers or the micadon and condenser are ruined? Have never used a lightning arrester and thought it had probably received an overcharge somehow though I always mean to disconnect it from the antenna.

A.—It is more likely that this is a five-tube tuned R. F. set and not a neutrodyne and it seems to us that you must be mistaken on this point. If you have tested all of the accessories and find that you atteries give full voltage someone must have tinkered with your receiver or in some way damaged the tubes. The only correct test for dry cell B batteries is to let the set run for half hour or so and then test them with a voltmeter

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Outside the station of the station of all stations and their operators.

Outside the station of all stations and dealer stand or radio dealer's, only 25 cents—or just mal a quarter to us.

P. F. COLLIER & SON COMPANY 262 Park Avenue



Underground Antenna Gable
(13999) JB, Cle Elum, Wash.
I would appreciate it very much if you would tell me where I could get some "Packard high tension cable" of which Edward Thos. Jones spoke in his article, "Underground Antennas for Summer Reception." Also the price, if you could get it for me. Would you also please tell me where I could get a stamp book in which to place the stamps that Radio stations send you to prove that you heard them.

A—We have your letter requesting information as to where you can purchase high tension cable. While we cannot advise where to purchase Packard cable we wish to suggest the Paranite cable which can be had from the Schneitter Radio Co., 420 Felix Street, St. Joseph, Mo. We would suggest the use of 200 feet of this cable with a four foot cross

Salesmen calling on radio dealers wanted to handle Radio Tubes as a side line. Thoria Tube Company, Dept "D," Middle-town, Ohio.

Radio Drills SPECIAL SEMI-

ling all grades of Bakelite and all metals, e or Radio outfit complete without one of our kits, 60 different drills ranging in size Special kits. 60 different delle ranging in size from 1/4" down to less than 1/64" SEIND NO MONEY ORDER TODAY And we will send you one of these wonderful kits at the remarkable price of All slipments (c. 0, 1. Insured Parcel Post DAVENPORT RADIO CO., 327 Sc. LaSalle St., Chicago

Market Commencer Commencer

Their album sells for \$1.75.

Aerial Noise Maker

(13977) RAJ, Fairfield, Ill.

I have just had a Radio installed and the electrician who put up the aerial soldered a screen door spring to the end of the aerial and then hooked it to the insulator. Please tell me if this would effect the set? We notice much crackling and noises in it.

A.—We wish to advise that the presence of the door spring in your antenna between the insulators would certainly cause a crackling noise in the receiver. The spring should be shifted to the other side of the insulator so that it is between the post and the insulator. In that position it will still give resiliency to the installation but not affect the tuning or the radio frequency currents.



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# Radiophone Broadcasting Stations

Corrected Every Week-Part II

#### FIND MISTAKES AND YOU'LL GET , DOLLAR

NE DOLLAR will be paid to the Radio fan reader of Radio Digest submitting the most errors in any one station's listing in the Directory of Radiophone Stations, which appears in five parts, serially continuously on the next to last page. Letters must reach Radio Digest's office not later than one week from date of issue corrected. Readers are not limited to correcting one station, but such corrections must be verified by the stations themselves, and NOT by comparison to other so-called accurate Ra dio directories or lists. Verifications, must accompany corrections. Turn in corrections for as many stations as you can find—if you can find errors! Use separate sheet of paper for each station submitted and place name and address on each sheet. In case of tie, duplicate awards will be made.

#### United States (Cont'd)

(Note-The second part of the schedule list appears below. The first appeared last week.)

(Note—The steem) part of the schedule Hast appears below. The first appeared hast weekl.

KIS, Los Anneles, Calif. 392,9 meters, 759 wetts. Sibile Inst. of Los Anneles. Anneutorer, M. E. Carrier, Slogan, "King Jesus Saves." Mor. 8-9:30 pm, Tues, Wed, Thrurs, 8-9 pm, Pril. 7-9 pm, Sur., 10-25-wed, Thrurs, 8-9 pm, Sur., 10-25-wed, Thrurs, 8-9 pm, Sur., 10-25-wed, Sur., 11-25-wed, Sur., 11-25

Joaquin Lt. Pr. Corp. Slegan, "Mome of the Raisin."

Joaquin Lt. Pr. Corp. Slegan, "Mome of the Raisin."

Angular sincerium.

10. 255 meters. 10 00 watts. Association Station. Luve Electric Co.) Mon, Ved. Fri. 16-7 pm. popular integrating: 9-10, artist's program. 16-7 pm. popular integrating: 16-10 pm. popular

KUO, San Francisco, Calif. 269 meters. 150 valis. Sen Prancisco Examiner. Slegan. The Voice of the West."

KUOM. Misseult. Mont. 244, meters. 250 valis. University of Montania. 184 meters. 250 valis. Wiley. Project of the Stan Agentle Valley. Daily St. 89 pm. concert. Stan. 2-3 pm. concert. Predict. (WKC, Kansus (Ur.) Mon. 250 meters. 180 valis. Wiley. St. 89 pm. concert. Stan. 2-3 pm. concert. Predict. (WKC, Kansus (Ur.) Montania. Only 100 pm. minist. Chans. 2-5 pm. Stan. St. 80 pm. concert. Stan. 2-3 pm. stan. Stan.

ford College Ryalin club. Amounteen, Genald C. Gross, Thurs, 10-11 pp. lectures, music. Eastern divigint.

Gross, Thurs, 10-12 pp. lectures, music. Eastern divigint.

Gross, Thurs, 10-12 pp. lectures, 100 watts. Scott High School, Closel for the summer.

WABU, Camdey, N. I. 226 meters, 50 watts. Victor Talking Mad Jine Co. 30, enters. 50 watts. The College College

WADO, ANDO, Ohio. 228 meters. 190 witts. Albert 3.

WADO, ANDO, Ohio. 228 meters. 190 witts. Albert 7.

Simmon.

WADO, ANDO, Ohio. 228 meters. 190 witts. Albert 7.

Simmon.

Wed, 191 pm. Sat, 10-1130 am, church service. Saters 400 meters. Mon. Wed, 9-11 pm. Sat, 10-1130 am, church service. Eastern daylieht 111. N. N. 215.0 neters. 200 meters. Wado, Wed, 9-11 pm. Sat, 11-1130 am, church service. Eastern daylieht 111. N. N. 215.0 neters. 200 meters. 200 meters

Fr. 3:30 pm, talk. Sun, 8:30 pm, sermon, music. Central.

WCAO, Baltimore, Md. 275 meters, 100 watts. Brager of Baltimore Announcer, R. B. Brunner, Slogan, W. B. Starter, M. B. Starter, S. Brunner, Slogan, W. B. Starter, W. B. Starter, S. Brunner, C. P. Gascuisne, Mon, 7-10-30 pm, Wed, 7-10-30 pm, Fri, 7-10 pm, Sun, 11 am, 4 pm, 6:20-9:15 pm. Eastern WCAR, San Antonio, Tex. 23 meters, 100 watts. Suchem Radio Corp. of Texas, Announcer, L. Taton, Sat, 8:30-9:30 pm, concert. Wd, Sat, 11 pm. Cettral.

Sal, 8:50-9:50 Dm, concert. Weo, Sat, 11 pm. ver-WCAT, Rapid Gity, S. D. 240 meters, 50 wats, S. D. State School of Mines. Announcer, J. O. Kammerman. Daily ex Sun, 9:30 am, 12:30 pm, weather, reports. Thurs, 7:30 pm, concert. Mountain. WCAU, Philadelphia, Pa. 278 meters, 590 watts. Uni-versal Broadcastins Company, Tues, Fri, 5:30 pm, 10:21, 20:22, Thurs, 4:30 pm, 7:30-8, 25:35:45 mt.

versal Broadcastans to the first property of the first property of Vermont. Storan Trans. 1:03 pin. 7:39-8. Lauseum. V. A. W.C.A.X., Burlington, Vt. 252 meters. 1:00 watts. University of Vermont. Storan. "The Voice of the Green Market Property of Vermont Property of

E. Brüstein. Mon, 10:30-12 midnight. Tues, Wed, Fri. Sat. 7-8 pm. 10:30-12. Central. WCM, Austin. Tez. 258 meters. 250 watts. University of Texas. Announcer, J. Austen Hunter. Daily ex WCSH 270-an. 11:45, 2-45, 3-45 pm. Central. WCSH 270-an. 11:45, 2-45, 3-45 pm. Central. WCSH 270-an. 11:45, 2-45, 3-45 pm. Central. WCSH 270-an. 11:45, 2-45 pm. Meters. 1,000 watts. Wittensberg college. Announcer, Lester Crowl. Clossed for the summer.

"WCSO, Springfield, O. 248 meters, 500 watts, ConwCSO, Springfield, O. 248 meters, Londo watts, Wittenberg college, Announcer, Lester Crowl, Closed for
the numericater, Mas. 268 meters, 500 watts,
C. T. Sherer Co. Announcer, Chester Gayland, Stogan,
"The Voice from the Heart of the Components,"
Daily ex Sun, 10:30-2 pm, music, reports, 4-5,
324, 516 meters, 500 watts, Clark
Garling, Control of the Components, 10:30-2 pm, music, 10:30-2 pm,
Mon, Wed, Fit, 8 pm, music, 250 watts, Clark
Garling, Control of the Components, 10:30-30 meters, 10:30-3

Slogan, "Roamoke Down in Old Virginia," Daily as Sing, 12-1 jun, music 5-30-6-15, music, news, weather. WDBK, Cleveland, Old 190, concert. Eastern. WDBK, Cleveland, Old 190, concert. Old 190, concert. WDBK, Salem, N. J. 234 meters. 100 watts. Mortan MDBK, Diston, Maskett Closed for the summer. WDBK, Boston, Maskett Closed for the summer. WDBK, Closed for the summer. Boston, Maskett Closed for the summer. WDBK, Closed for Summer. WDBK, Closed

entertainment. There, Prix, 10 am, posseducid heart, and the state of the control of the control



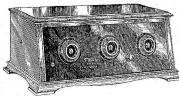
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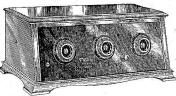
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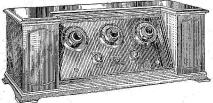
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