How to Build Heteroflex, the Four Tu Gold Cup Standing; The A-B-C's of T

# Radio Radio Revery J PROG REG U. S. PAT. OF I

Vol. XIV

WGES Opens New Studio in

Chicago—Plant in Oak Park
CHICAGO.—WGES, Coyne Electrical
school here, which stution is located at
the Oak Fark Arms hotel, Oak Park, Ill.,
has opened its elaborate new studio in
the Baldwin Piano building, in the Chi-

Copyright 1925 By Radio Digest Publishing Co. SATURDAY,

# HEAR DIVER IN DEEP SEA



Peeping out from behind her attractive summer furs up in the left corner we have Inella Drew Wilson, who has charge of the "Juvenile Period" at WBON, Chicago. Miss Wilson has had much thestrical and dramatic experience and is a nice of the famous John Drew. Way out in Utah, Ogden on the Overland Trail to be exact, Mary Pisher 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.

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

ISHAWAKA, 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 cabinct, though three half-inch wood screws held it in place. The remainder of the set including the five tubes was unharmed. An insurance 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.

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 12 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.

### **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 McNamee still stonds 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 score sheet having a name other than that of the "Eastern Sage" or the "Solemn Old Judge" at its top. Gene Rouse of WOAW, Omaha, is the inan who made the big jump in votes during the past week.

past week.

While Rouse dld 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.

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 fload 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 muching 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

Seren 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. two pegs from fourt at the same time Stan to the fifteenth place.

to the affectith 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 Swapnetaker

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 might last week and we deedled
to run a little Gold Cup contest of our
own. After tuning in 25 stations we took
a vote resulting thusly: O. E. Beeler, 17;
G. D. Hay, 3; H. W. Arlin, 3, and G. MeNamee, 2. We have deedled to present
Mr. Beeker 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."

	yes, the standing is as fol	
Pos	Ition Name and Station	Votes
1.	Graham McNamee, WEAF	42.811
2.	George D. Hay, WLS	29,667
3.	Gene Rouse, WOAW	20,372
4.	Henry Field, KFNF	15,080
5.	Hired Hand, WBAP	14,302
G.	H. W. Arlin, KDKA	10.655
7.		9,127
8.	Leo Fitzpatrick, WDAF	6.186
9.	W. G. (Bill) Hay, KFKX	5.074
10.	Lambdin Kay, WSB	4.931
11,	N. Dean Cole, WHO	4.813
12.	Robert Emery, WEEL.	4.548
13.	Charles Erbstein, WTAS	4,401
14.	Jerry Sullivan, WQL	4.213
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.

WEAF, 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?

ppression 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

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	Address
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### HEAR DEEP SEA DIVER

(Continued from page 1)

1997.

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 waterproef cable to the Steel Pier.

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 Gimbol Brothers' store, Philadelphia, after having passed through three separate amplifiers, and under the Delaware river.

Sanchlight Added Peature
A remarkable feature of the broadcast on Saturday was an experiment conducted in conjunction with the Westinghouse Lamp company of sub-sea searchlights. This company has made sub-sea search lights of small caliber for use in salvaging wreeks and locating bodies. Recently, they received a request for lights of small caliber for use in salvaging wreeks and locating bodies. Recently, they received a request for lights of small caliber for use in salvaging wreeks and locating bodies. Recently, they received a request for lights with the diving broadcast, being the most powerful sub-sea lights were oblif for use with the diving broadcast, being the most powerful sub-sea lights were 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 Huge 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 th

### New Stations

Oakland, Calif., will have a new 1,000-watt broadcasting station when KTAB, the Tenth Avenue Baptist church, goes on 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 Educational society. This station using the call KFWM may be heard by dialing \$24 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 Heensed this week are: KFWF, St. Louis, Mo., 250 watts, 214.2 meters; WHBT, New York, N. Y. 100 watts, 211.1 meters; (portable): WHBU, Foynette, 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, 236 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; WEAP, 8,000; WTAM, 2,500; WTAS, 1,500. WAFD, POT HUGO, 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

WOR, NEWARK, OBSERVES THIRD ANNIVERSARY

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

WOR, L. Bamberger's station at New-ark, 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. Vizctelly, famous lexicographer, and Houdini, 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 Pavey, will give the performances.

The nunicipal 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 Plunkett's 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 Schenestady 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 want

heard countrywice unrough wear 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 scemingly glutted with this type of music, Mr. Goldman overnight became one of the most popular of WEAF features. Witbin 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 audlence seems to want music, not necessarily light, but at any rate, familian. Mr. Goldman arranges exceptionally well rounded programs, usually opening with well-known "heavy" numbers, then gradvances.

On Sunday, August 2, WEAF, WEEE.

vanes.
On Sunday, August 2, WEAF, WEEI, WJAR, WCAP, WCTS, WWJ, WCAB and WFI will be linked for the concert starting at 9:15 p. m., Eastern 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
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.

License 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 560,000.

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 Parliament.

Can be proved to dentify the floating that he foating it has been found much superior to the ordinary telephone.

New Swiss Station Looms

BASEL, Switzerland. — Broadcasting equipment has been installed at the new fight.

After a summer season on the lakes the figure has grown to one and one-indicated the new found in the foating it has been found much superior to the ordinary telephone.

New Swiss Station Looms

BASEL, Switzerland. — Broadcasting equipment has been installed at the new fight.

The figure has grown to one and one-indicated the ready to provide Radio entertainment for sojourners in Florida this coming winter, as well as recreation for Mr. Crosley and his guests.

### 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 complied 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. EW YORK,-Hardly a day goes

### 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 Broadcaster First Two-Way Private Line in 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, Ir.'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 WLIW, Ir., which will serve to identify the floating station with that of the Crosley superpower Station WLIW in Cincinnati.

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 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 reception and transmission, and the com-

reception and transmission, and the company 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.

### **'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 Reincoke, with Foster's "My Old Kentucky Home" occupying a prominent position in the volume.

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

\*\*Row to Get Book\*\*

\*\*Everyone can get a copy of this book\*\*

exceptional intelligence with which they are handled."

Everyone can got a copy of this book by catching WHAS stient for as long as eight seconds during any of their next 365 evening concerts, except when such stlenees 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 nuch 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

NEW YORK—Opera in its two forms, the stirring tragedles of the grand opera and the light operata of the contemporary theater, will be heard on the WEAF wave length Tuesday, August II, at 10 n m

and the light operatts of the contemporary theater, will be heard on the WEAF wave length Tuesday, August II, at 10 p.m.

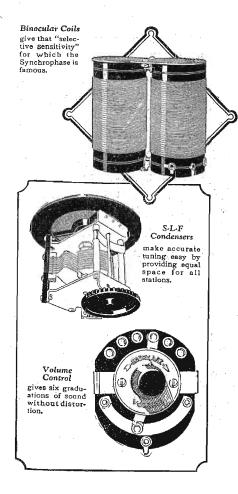
"La Gioconda," Ponchielli's adaptation of Victor Hugo's drama, "Angelo," will be sung by the WEAF Grand Opera company under the direction of Ceaser Sodero for the audiences of that station, WEEI, WFI, WCAE, WGR and WWJ. "La Gioconda" is a product of those happy days when the untamed music lover was considered, but at the same time, full of clarm 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 theype which its name indicates. Marie Opfinger, soprano; Joy Sweet, contraito James Haupt, tenor, and Chester Moffat, bass, comprise the four members of this popular group.

WBAP Erects New Aerial;

Silent During Building
FORT WORTH, Texas.—Plans for the
erection of a new antenna system have
just been completed by WBAP. The StarTelegram Radio station, and construction
work has started.
The new antenna will reach a height
of over 200 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 distunce of over 5.300 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
with the detector below oscillation.



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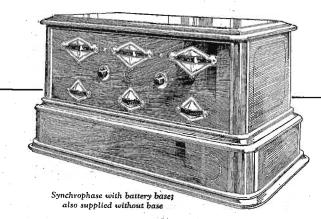
"If you would obtain virtue you must first serve your neighbor." -KWANG TZU

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"



Left, L. W. Zimmerman, program director of WTAM, is one of the livest wires around the plant. He is an elecutionist of note and often delignts the station's audience by his readings. The young man looking so seriously at the microphone is Austin J. Wylie, director of his own orchestra which broadcasts by remote control from a leading Cleveland restaurant. Wylie also announces the musical numbers they play. The spacious, cool looking room in the upper center is WTAM's reception room.

"HE Voice from the Storage Battery!" It is a fitting slogan that the Williard 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 second of the second is chief engineer in charge of WTAM. It was Mr. Leonard who designed the station and its equipment, following plans that were largely his own and which, in no small degree, have contributed to the station's success. Better known as 'Eddie,' Mr. Leonard has a host of friends among the Radio enthusiasts of Cleveland and is never too busy to help in solving an experimenter's trouble so me problems. Associated with Mr. Leonard is Mr. C. C. Russell, station operator, and Mr. J. J. Francis, late of Station KDPM in Cleveland.

Mr. Arthur R. Herske, chief announcer, deserves a better acquaintance than can be given in these pages. It may be that 'Art' has a dual personality; certain it is that Mr. Herske can adapt himself with utmost ease to the type of program that he may be announcing. When the program is of a serious nature, featuring the best of classical offerings, Mr. Herske is sedateness personified, dignity itself. But when the ragged strains of jazz are disentangling themselves from the aerial and the axxophones are wailing forth the rhythm of 'Red Hot Mamma,' then we have another 'Art' Herske; 'a fellow of infinite fest and excellent fancy.' Mr. Herske is at his best in announcing the offerings of the 'Coo Coo club,' an aggregation holding forth on Saturday evenings.

This brings us in immediate touch and ac-

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 offect 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 called upon very oftens essense 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 cencert 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. Housleeper 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 \$1,000 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

cated the necessity for a copper-to-glass seal.

Copper Replaces Costly Platium:
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

How Copper-to-Glass Seal Works

broadcasting stations.

How Copper-to-Glass Scal Works

Mr. Houskeeper's invention briefly consists in the discovery that a copper-glass scal fails by the shrinkage of the copper away from the glass, and that this still the comparison with the other that it can be stretched or compressed by its heavier team-mate. Due to its greater dustrivity, 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 heatted 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 conper disc which is then rubbed into contact with the first of an off a short glass tube. The other end of a short 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.



### 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 Soott 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)

(Continued from page 5)
These popular dinner concerts are varied often by Guy Lombardo and bis, 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 audience is that of Austin J. Wylle. Mr. Wylle is probably the mnst unassuming orchestra leader that can be found; modest almost to the point of diffidence. Wylle's orchestra was selected to entertain at one of Cleveland's most pretentious eafe dansants—it has been called upon for phonograph records time and time again. Mr. Wylle often announces his own programs, using a portable remote control equipment.
Since the opening of the summer season, Frank Wilson's Euclid Beach orchestra 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

In joining a copper tube to one of glass, he end of the copper is worked to a thin fin only a few thousandths of an inchiler. 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 tubers 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 intered of a short glass bute. 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

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CHICAGO—"BIII"

(W. G.) Hay, who for way vars has been one of the vacuum tube.

CHICAGO—"BIII"

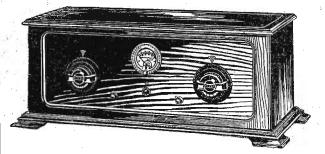
(W. G.) Hay, who for way vars has been one of the common for for the unique features that have foremost announcers and program directors in Radio, was given a reception at WLS, the Sears-Roebuck station, the evening of July 24. Mr. Hay is known to Radio fans for his work in the first work in the list inched and many friends while he was connected with KFRKX. Hastings, Nobr., which station he left a month geas in Chicago.

Mr. Hay possesses a remarkable horse of children, the period which work in him per program of the was connected with KFRKX. Hastings, Nobr., which station he left a month geas in Chicago.

Mr. Hay possesses a remarkable hastility when the list incides almost a hundred men and at RFRKX. Hastings, Nobr., which station he left a month geas in Chicago.

Mr. Hay possesses a remarkable has a manifest impossibility when the list incides almost a hundred men and at the province of the proper relation become the many friends while he was connected with KFRKX. He put an appropriation of the province of the proper relation because of the province of the proper relation to the province of the proper relation to the proper relation to the proper part of the vacuum tube.

"BILL HAY IS GUEST AT WLS GUE



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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 124-25 it was found that the always present deficit 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 Zonth Radio corporation, is of greatest interest to the Radio public and perhaps to the lower 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

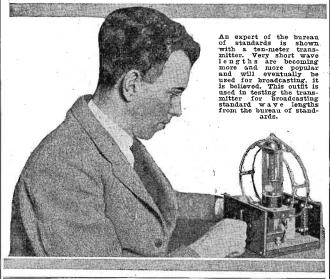
Mr. Marks, in his letter to Mr. Insull, points out this fact and gives additional reasons why he believes that the logical solution of the deficit lowering problem is in the use of the Radio to increase a public appetite for classic music. The opera director's reply is awaited with great interest by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

A part of Mr. Marks' letter follows:

"What persons other than those missically inclined could truly say that they liked classical nusic? 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 pubsical performances, the general pubsical management of the World Radio Church Pastor

"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

Has Direct Appeal to Listeners

By Eugene Konecky

The Station Wood, at Omain, Nebr.

By Eugene Konecky

The World at Omain, Nebr.

But statistics are cold blooded affairs, after all. There is more educated to this class of music, and the proadcast of music, There is no greater medium for music. There is no greater medium for music, There is no greater medium for serving that the preacher of the proadcast in station. An operatic performance were broadcast in station. The story is unusual. The WOAW Radio pastor in the discard. Instead of the musical conedy houses crowded and soil out nightly, the theaters producing srand operatic performances, the general pubsical part to prevent a strong the past two years had traveled some odd ten musical conedy houses crowded and soil out nightly, the theaters producing srand operatic performances, the general pubsical part to prevent a strong the musical conedy houses crowded and soil out nightly, the theaters producing srand would assume the leading position."

"Preacher of Million Listeners" Is The sympathetic and disappointed citizens of the Boone congregation voluntarily started a subscription for a new car, with-louing musical part time, the preacher with a million inform

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

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. 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.

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 firemenace 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 careless 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.

"In 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 eutposts in touch with the world. Not only do rangers and fire secuts 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 country. 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 hear over the Radio without difficulty.

By Eugene Konecky

The announcer is speaking: "This is Radio Station WOAW, the Woodmen of the World, at Omaha, Nebr.

Tou are listening to the religious services of our World Radio congregation, of which Reverend Brown will now present his sermon."

No jazz; no sensationalism—a spontaneous, sincere 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."

Noverend Brown knows his audience, the youngsters and grown-ups, the tradesmen, mechanics, editors, doctors and shutins. He knows that his message must be simple, direct, emotionally sympathetic. He says: "I see 'en all, in the steel-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

the title, "the preacher with a million listeners."

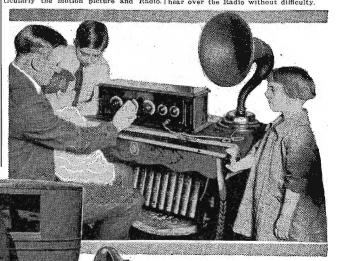
But statistics are cold blooded affairs, after all. There is more eloquent testi-mony than documents, words or num-bers.

after all. There is more eloquent testimony than documents, words or numbers.

Country eggs by the dozens, honey, bulging hams, turkeys, candy, cakes of the best homemade vartety, pictures, hrooms, 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, Iowa, 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 now, Brown's Sunday morning services "hit home," in the literal sense of the



Just because Rev. R. R. Brown was so much delayed in visiting a meighboring community so deliver and the later of the WOAW and the Radio listeners of the WOAW and tene a read the later on the quiet and purchased saits 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 prefessions, 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

Stutenby silent alight for: CNRT, KFAE, KFDM, KFMG, KFUO, KFWA, KLDS, KLL, AGA, WBAG, WBAU, WBAU

concert orthestra; Mrs. George togers, paanus; any carron. Georgeon. Regient, reader: hermonical Engineers, reader: hermonical Engineers, reader: hermonical Engineers, reader: hermonical Engineers. Committee St. R. 1974. Spranger Children Stellivan, Bengipies; Chatean Hauster dance WBBR, New York, N. Y. (272.8), 8 p. m., Dr. Hans Hang, violinist; 8:10, Fred Twarestein, lenui; 8:15. Elitio muestions and answers, Judger Rutherford; 8:16. Elitio muestions and answers, Judger Rutherford; 8:16. Elitio muestions, and the secondary of the secondary of

dunier concert. Room. Cardina neues; 5. toe Louisi dunier concert. Room. Cardina neues; 5. toe Louisi dunier concert. WEAR. Civesiand. Ohi (289.4), 7-8 D. m., norella dunier concert. WEAR. Civesiand. Chief. Cardina neuestral dunier concert. WEBLE. The Cardina neuestral neuest

LeMare: 11. Marion McKay's Bond Hill noise orchestra.

WLS, Chieago, III. (344.6), 7.45 p. m. Iuliby time;
Sel 3. m. national barn dence program; Tony Corsymmetry Peterson, Kentacky
was aderbean; Peter Lee Huffaller, Peterson, Kentacky
was derbean; Peter Lee Huffaller, Peterson, Marken, Peter and Peterson, P

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 broadcast through WPG, Atlantic City; WGBS, New York; and WMAF, Dartmouth.

mouth.

Caruso will be honored by KDKA, Monday evening. August 3, when Harry Brunswick Loeb, the poet of New Orleans, will read his poem, "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. 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.

rare sunicipal orenestra completes 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 moenitic 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 WBZ. Dr. Hooton is an authority on this subject. Here is a chance to get

WMAQ, Chicaes, Ill. (447.5), 5.45 p. m. Griegolivenderen bestell gener u. to be manuscriticage.
Jack Chapman's orthester: 8. Fred Daw, Buerell
Pratt, 263. Radio photologue, "The Texas Border,"
WMAG, Chicaes, L. Weekly Chicago theater program,
white Consecution, and the state of the control of the contro

KFAR, Intenin, Nebr. (306.0), 5-7 p. m., dimer concert, KFMF, Shenandeab, Iswa (265), 7:30 p. m., Dora P. (KFMF, Shenandeab, Iswa (265), 7:30 p. m., Dora P. (KFMF, Shenandeab, Iswa (265), 7:30 p. m., Datters review, Tomathe Fielding: 10, dance music comedy night, Jack, Jim, 70m. (011) (Giben, Herny Miller, KFM), Jim, 10m. (101) (Giben, Herny Miller, Miller, Lin, Herny, Herny, Jim, 10m. (101) (Giben, Herny, Jim, 10m.) (

WOAI. San Antonio, Texas (394.5), \$:30 p. m., Mengar hotel trio.

WOAW, Omaha, Nebr. (526), 6 p. m., Risilto orchestra; 1. Oliber Jaffy and bis of permetter; 7:20, speaker; 1. Oliber Jaffy and bis orcentral; 7:20, speaker; 1. Oliber Jaffy and bis organ jutilities.

WOE, Davaspoort, Iowa (483.6), 9:10 p. m., Ambrase Bectham, yodier; Leika O'Routko, soprano; Howard A. Meathum, bartions. Electronic Howard A. Meathum, bartions. Science James Heeden, Science Jaffer, WSMB, New Orleans, La. (319), 6:30-7:30 p. m., entertainment; 3:20-11:20, Insalest programs. Science Jaffer, Science Jaffer, Standard Time Stations.

KFOA Standard Time S

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

Atlantic or Eastern Daylight Saving Time Stations

CFGA. Toronto. Can. (386). 11 a. m., Bloor Eaptist, church; 7 p. m., service, Timothy Eaton GFGA, Torento, Can. (358). 11. a. m., Bloor Street Bauits, church; 7. D. m., service, Timothy Extent Manufact church, M. Y. (272.6). 10. a. m. When Manufact church, M. Y. (272.6). 10. a. m. When Manufact Church, Church Church, Chur

Arie Street Proshyterian church; 9:15, Goldman bund concert.

GGBS, Naw York, N. Y. (315), 3:30-4:30 p. m., Precedibly theator program; 8:309-9:30, program from the program from the program from the program from the program of the program from the program from

WHM. New York. N. Y. (381.2), 5-5:30 p. m., Rossland daner orderstra; 10:5-7:11:5, Janssen's Hofbrau orderstrained to the control of the cont

Eastern Standard or Central Daylight Saving Time Stations

Saving Time Stations

KDKA, Pittsburgh, Pa. (309.1). 9:15 n. m., services,
Calvary Epissonal church; 5:30, busebull; 7:15, municipally
band concert. [635.4). 1:1-2 n. m., Second
Presbyterian church; 3-4 n. h., Station concert.

WBBM, Chicago, III. (258.4). 1:1-2 n. m., Second
Presbyterian church; 3-4 n. h., Station concert.

WBBM, Chicago, III. (258). 4-5 p. m., tea dance program; BBI Kohara Wirth orchestra. Nate Caldwell;
Gariant; 1:2-2 n. m., Standy orchestra. Nate Caldwell;
Gariant; 1:2-2 n. m., Standy midmiss in use club reactions;
Standard orchestra; Ralph Atlass, Charlie and
WBCM, Chicago, III. (258). 4-5 p. m., Lain, & Son
elassical concert; 7-8, elassical hour; S-11, Midway
dancing atardens orthestra: Alice McKalmen, contraine;
Jean St. Ahne, French bartione; Ted Turnoutsi, monprano; Henres Brance, Sergenson Penry, Bentifurd, soBig Boy Nagle; Penry O'Nell, soprano,
WEX, Surfagladd, Mass. (33.1), 8 n. "Starlers
and Childron," Lee Patterson; 8:35, Morten Bachrach,
WCX, Dereft, Mich. (316.8), 10;30 a. m., serticex,
WCX, Dereft, Mich. (316.8), 10;30 a. m., serticex,
WCX, Dereft, Mich. (316.8), 10;30 a. m., serticex,
WCX, Dereft, Mich. (316.8), 10;30 a.m., serticex,
WCX,

and Religion, Leep Autoreson, 1230 a. m., services, tenor, WCA, Detroit, Mich. (316.9), 10:30 a. m., services, Central Methodist Enlavonal church; S, the Detroit WEAR, Claveland (1981), 10:20-20, p. m., alternoon musicale, Francisci string unsemble; 7-8, Park theater sechestra.

Chicago, 111. (370.2), 7-9 p. m., astists'

werbestra.

WEBH., Chicago, III. (370.2), 7-9 p. m., astista'

WEBH. Chicago, III. (250), 5-7 p. m., elastical program: O. L. Gelbiert, Larience: Anena Baat Sayder,
contrailtr; Francis Barne, violinist; Lisie Barne, piansis; John Stamford, tener; Lizael Grey, reader; 10-31

22. facture program: Chrence Partish, pianist; PatElectrical Sandon; tener, lizael Grey, reader; 10-30

23. facture program: Chrence Partish, pianist; PatElectrical Sandon; Sandon; Chrence Partish; Panist; Coyne

WGN, Chicago, III. (370.2), 11:45 a. m., Chicago thratter; 3 p. m., Lincolo Path bund cancett; 9-10, Drake
oppert cresemble,

WCR, Chresto, Christ Scientist; 7 p. m., anguell program

from WJX; 7-45, Latewood farm ensemble, WIZ; 3,

WILD Manabarat, III. (309.8), 12-10-30 p. m., Paul

WILD Manabarat, III. (309.8), 12-10-30 p. m., Paul

WILD Manabarat, III. (309.8), 12-10-31 a. m., Calbox

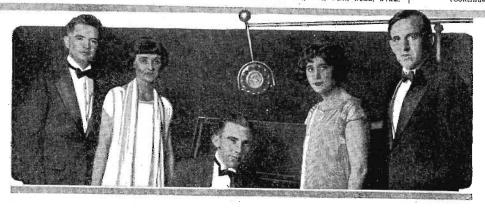
WILD Manabarat, III. (309.8), 13-50-315 a. m., Calbox

WILD Manabarat, III. (309.8), 12-10-310 p. m., Paul

Williams (1998) (11) (1998) (12-10-30 p. m., Faul Rador, Rador, Pilot, Mosebbart, III. (302.8), 8:35-0:15 a. m., Catholic actives; 10:10-11-30, Trotestant services; 12, consultations of the actives; 12, consultations of the actives; 13, consultations of the active actives; 13, consultations of the active actives; 13, consultations of the active active actives; 13, consultations of the active ac

Wils, Chleage, III. (344-8). (1998). (

entertains exclusively for KFRU. They have revived many old English ballads and sing them with so much spirit that the listener can imagine himself back in old England.



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

# WEDNESDAY WLS PLANTATION NIGHT

### Sunday, August 2

(Continued from page 8)

D. m. I. B. S. A. chuel strongers; T. Elisa Freeman, spentage Alice Welsten, accompanist; T.30, Bible lecture; R. F. Hellister; Q. Chiesgo, H. (44.5), 3-10 p. m., Rainho Garriere, accompanist; T.30, Bible lecture; R. F. Hellister; A. L. Hellister; A. C. L. Hellister; D. G. Hellister; D. Hellister; Marcial Chief. D. Hellister; Marcial Hellister; D. He

Mindaw, barttime, Lilan Older Bell, reader: Martin Hindiaw, barttime.

WEEO, Landine, Mich. (285.5), 10 a. m., Bellry Physical Control of the Control of the

Central Standard Time Stations
KFAB, Lincoln, Nebr. (340,8), 4-5 p. m., German Evancelicul church, Rev. M. Kuchne.
KFDM, Baaumont, Texas (315.6), 8-9 p. m., sacred
program.

The Description of the Council of th



10:15 concert. Cential Park: 10:15:10:30, "Trend of bear Threes Dr. System; N. Usisher.
WOO Physics Dr. System; N. Usisher.
WOO Physics Dr. System; S. Strand tester convert; 8:30, Guldinan band; 10:14, Gulkeppe dl Benefetto, tenur; 10:20, Bossert Marine Reof orchestra; ll. A. Candelorl's dance orchestra.
Candelorl's dance orchestra.
WH. Rewark, N. J. (405.2), 8:15:7:15 p. m. Srnie Bl. Warner, 10:15 p. m. Srnie Bl. Warner, 2:2-2, A. Redd's Bour.

WOR. Newark. N. 16 (405.2); 6215-725 p. m., Smile Krickett's Cinderella orchettar, 215-720, sports that, Bill Walhey; 9-19, Al Reid's hour.

Eastern Standard or Central Daylight
Saving Time Stations
KDKA, Pitthburth Pa. (809.1), 8-36 p. m., concert.
WBBM, Chicago, Hl. (226), 6-7 p. m., ceneart.
Charliog Interior Shater of the control of the c



KFUD. St. Louis, Mc. (585.1). 8.15 p. m. "He Avended—to Indize the Quick and the Dead."

KFVE. University City, Mc. (250). 10 p. m., organ rectul, sacred and clinscaled music. Wilber H. Mocker-KLDS. Independence, Mc. (441). 11. a. m., studio services and the Dead."

KLDS. Independence, Mc. (441). 11. a. m., studio services. List. Services and the English of the Common of the Co

9:36: 10:30, "huserst program, reverege source, soldwood and North (268), 9 a.m., chanel services, Rev. R. Rivewr; 9 p. m., chapel services, Methodist Episcopal church lowe (483.6), 1:5 p. p., Phaner Little Symphony concert: Ereth Swindow, D. p., Phaner Little Symphony concert: Ereth Swindow, Concert Ereth Swindow, S

Mountain Standard Time Stations
0.4. Denver Colo. (322.4). 11 a. m., Trinity Methodist Episcopal church; 4 n. m., Trinity Methodist Episcopal church; 4 n. m., Trinity Methodist Episcopal church music; 7:46. Trinity Methodist Episcopal church

copai church.

Pacific Standard Time Stations

KFWB, Hollywood, Calif. (252), 9-11 p. n., 1ste sports
and world news followed by Warner Bros. shark

KFGC Grand Calific (361 C.) 1 a. n., 1st. sports

KGC Grand Calific (361 C.) 1 a. n., 1st. sports

KGC Grand Calific (361 C.) 1 a. n., 1st. Mortion

Calific heeter control of the State Calific heeter cort: KGC Alle Semploy Carefic (361 C.) 1 a. n., 1st. Mortion

Methodist Episcopat church.

Petrinella Trimbur (left) plays the Wurlitzer Unit organ Tuesdays at 12:15 p. m. from WLW. Oincinnati. 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, Payetteville.

KGW. Porthand, Ore. (491.5). 10:23-12 hours, services, First Presbytectan church. Dr. Housed Boronan pastor; 7:35-9 p. m., services, First Presbytectan church. Dr. Housed Boronan pastor; 7:35-9 p. m., services, First Presbytectan number of the control of the co

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

tentscopal clusters: 7 p. m., Pirst Methodist Eniscopal (RNX, Holtywood, Calif., (38.5), 7.8 p. m., Pirst Pirst byterian church of Hollywood, Rev. Stewart F. Me-Lennan, Beatoris S-9, Ambussador hotel connect ortheodors of the Company of the Compa

### Monday, August 3

e may be heard from RFMQ, Fayetteville.

concert, William Penn hotel; 8:30, concert; II, dance music, Samilers Inn., v. (491.5), 4:5 m. m. missien with the property of the pr

Cont company: sparks by Likscit's Red Hot Plano player: 11, organ rectoil, Cyril Duschitz; the Pamous WMA Pantle Quarter, V. (265.5), 8:30-10:16 p. m., musicale, Max Freedman. WHBF, Minni Bendt, Fla. (384.4), 7-7:30 p. m., studio concert; 7:30-8, dance music, Fleetwood hotel orchest-tar; 10:12, Fleetwood hotel orchestra; 10:12, Fleetwood hotel orchest-

WORD, Battwin, Ill. (275), 8:30 p. m., Bible questions and answers; 8:36, studio recttal, Colonbia Consertatory of Monatt. Ohio (326), 10 p. m., Hoten Krahn, World, Martin, Prisedlia Holbrock, planist; Irvia Confer, tener.

6355, dinner numic.

WWI, Detroit. Mish. (352.7), 6 p. m., dinner cencert;

729, Goldman band concert.

Central Standard Time Stations

KPAS, Lincola, Nahr. (346.8), 6-7 p. m. dinner proGravenhardt, bandist; Clork Dates, 185.59, Mart.

Gravenhardt, bandist; Clork Dates, 185.59, Mart.

Gravenhardt, bandist; Clork Dates, 185.59, Mart.

Gravenhardt, bandist; Clork Dates, 195.59, Mart.

KFRU, Bristow, Okia, (394.5), 7-8 p. m., Oblahoma cducational hour; S-19.30, music,

KFUE, University Cliy, Mo. (250), 10 p. m., occupant conductional hour; S-19.30, music,

KFVE, University Cliy, Mo. (250), 10 p. m., occupant conductional hour; S-19.30, music,

KFVE, University Cliy, Mo. (250), 10 p. m., occupant conduction, 195.50,

(Continued on page 10)

# FARMERS' FROLIC THURSDAY AT WFAA

### Monday, August 3

(Continued from page 9)

WHO, Des Moines, lewar (252), 7:30-9 p. m., Stewart Watson, harttone; Jelon Birmilugham, accompanist; artists, Deem Holmes Cowper, director; 11-12, "Community or the Sugar orthodra, many sugar orthodra, many sugar orthodra, C. tv. Watson; 3:30, Benet's Mondish syncontons; WOAI, San Antonio, Tex. (394.5), 8:30 p. m., Jann Lake, C. tv. Watson; 3:30, Benet's Mondish syncontons; WOAI, San Antonio, Tex. (394.5), 8:30 p. m., Menger hosel trio, man, Nutr. (896.), 5 p. m., Phyllic Orthodox, Orthodox, Nutr. (896.), 5 p. m., Phyllic Orthodox, Nutr. (896.), 5 p. m., Phyllic Orthodox, Orthod

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

KFWA, adden. Utah. (2017, 9-11 p. m., Eussam Drugcompany.
KOA, Denver, Cole. (322.4), 8:30 p. m., Ecther: White,
and his Silver State orchestary 17:30, Sandman's hour;
S. "The Twelve Pound Look." The Maker of
the Commander Suchen. Standame touterery:
"Glary Commander Suchen. Standame touterery:
"Glary Commander Suchen. Standame touterery:
Fowler, cellist.

Pacific Standard Time Stations
KFOA, Seattle, Wash. (354.3), 6:6:35 p. m., Olympic libeted conners orchestar; 6:5:8-216. Sherman, Clay
and conners programs: S:30-16, Times dance music.
KFOA, Seattle, Wash. (354.3), 6:6:35 p. m., onliderer;
KFOA, Seattle, Wash. (355.3), 6:7 p. m., onliderer;
KFOA, Seattle, Wash. (357.0; 6:7 p. m., onliderer;
KFOA, Seattle, Wash. (359.16, Times dance music.
KFOA, Seattle, Wash. (359.16, Times dance music.
KFOA, Seattle, Wash. (358.3), 6:6:35 p. m., onliderer;
CHUE, Individed Calif. (237), 6:7 p. m., onli



willian Mad-sen is director of MoCrory's popular period by a a Work william william william to a work were Monday at 6:30 p. m. she is an ex-cellent planist and oputs on one of the most popular jazz programs of the week.

KGO, Dakland, Calif. (391.2), 6.7 B. m., diener censen Wiley B. Allen company G. P. m., diener censen Wiley B. Allen company G. P. M., diener censen wiley B. Allen company G. P. M., diener cengen der her der diener der her betreitet general der 
Company G. William institute; "From a 
Company G. Arthur S. Carbott; 
Street, Arthur the 
Company G. Arthur S. Carbott; 
Street, Arthur the 
Company G. Arthur S. Carbott; 
KGW. Pertland, Ora. (491.5), 6.7 p. m., Claude John
Schott and S. Jaket Chater ordeatrs; 193-8, bestoalt 
Schott and Company G. Carbott 
C

son and his Daker theater ordestra; 1:30-8, basaball scores.

KMX, Hollywoodpon, Calif. (330-9, 5:30-6:15) p. m. Wir
KMX, Hollywoodpon studios (1.5) travel talk, W. F.

Alder: 6:30-7, Alwater Sent Radio forbettra, Paul Flinstein, leader: 77-730, program, Matual Moters; 1:30-8, program, Octumbin Gunifitting company; 6-10, program, L. W. Stackwell company; 6-10, program to the company; 6-10, program to cown Cord dance ordestra. LdVan May Challenger, controller; 11-12, Abs Lyman's Checanut Grow dance ordestra; KD (100-10); 11-12, Abs Lyman's Checanut Grow dance ordestra; 7-7-7-30, Rudy Seiger's Farimont hotel orchestra; 8-12, special opening program for new station.

### Tuesday, August 4

Tursday, silent night for: CNRT, KFAE, KFUO, KFWA, KOA, PWX, WAHG, WBAV, WBBR, WCBO, WHAO, WHAZ, WKAQ, WLIT, WMAK, WTARI.

### Atlantic or Eastern Daylight Saving

Atlantic or Lastern Bylight Sayling Sayling Time Stations

WGAE. Pittsburgh, Pa. (461.3), 6.30 p. m., dinner cencert, William Penn hotel; 8, program from New York; 8.30, Gold Dust Twins; 9, Evereddy hour; 10, Grand Outer.

WGAU. Philindelphia, Pa. (278), 6.30 p. m., Billing Hayes and his Cathay Tea Gorden dance orchestra, Billy Hayes and his Cathay Tea Garden dance orchestra.

Billy Hayes and his Cathar Tea Garden dance orWOWE, Previdence, R. 1. (440.9), 3:30 p. m., Airendia orthesita,
WEAF, New York, N. Y. (481.5), 4:5 p. m., Airon,
WEAF, New York, N. Y. (481.5), 4:5 p. m., Airon,
which is a supersymmetric company of the control of the control

WJAH. Providence R. 1. (305.8), 7.53 p. m., studio corporate S. 20. Cond. Dut. Prenis. 1. Sversady hour. WJV. New S. 20. Cond. Dut. Prenis. 1. Sversady hour. WJV. New York, N. Y. (454.3), 4.39-5.39 p. m., Bernlard Levilovis Hold Commodors to ordestra. 2.32-5, dully reports: 7-7-15, Frank Doles des talk; 2.32-5, dully reports: 7-7-15, frank Doles de

Ganz, conductor.

McA, New York, N. Y. (340, 7), 5:30-7 p. m. CaroBidans' orchestra; 7-8, "Jack Wilbur's Personalities",
8-8:30, Mag licen; and Peter de Rose, banjoist and
plantis; 9-9:15, Frederick Gerorid, baritone; 9:309:45, Frederick Gerorid, baritone; 19:309:45, Frederick Gerorid, baritone; 19:31, Chiroprac-

Phil Wilcox, syucopator; Sandy McTavish, Scotch comedian; Cypne Ricetrient school serennders. W6N, Chicago, III. (370-2), 6:39-7:30 p. m., Drake concert ensemble, Blackstone string quintet: 8:30-9:30, studio program; 10:39-11:30, Drake Holel Terrace WGY, Schenestady, N. Y. (370.5), 6:20 p. m., "Do Some of Your Trees Need Helps", "Inconomical Cheap Apples," Harold B. Tukey; 6:35, bec tells, L. A. Huguenont; 6:34, Program, WOY studio; 8:35, "Over the Seven Sear"; 7:25, New York Philherconic Osterhout, Phallat; 10, Maydowst codestrano; Education of Stepholy, Phallat; 10, Maydowst codestrano; Cheap Capital; 10, Maydowst codestrano; Maydowst codestrano; Maydowst codestrano; Maydowst codestrano; Wilkens and Mardins; Uncle Bill'a Borden birthday party; 8,

### 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 Say-

Atlantic or Eastern Daylight Saving Time Stations

Saturday, Angust 11 4:30, WJZ;
6:30, WJZ; 6:40, WPG; 7:15, WOR;
7:35, WNC 3, wJZ; 4, WJZ; 4:30,
WJZ, WCAE: 5, 5:30, 6, WJZ; 7:15,
WEDI, WOR; 7:25, WNYC; 8, WJZ;
Tuesday, August 4: 4, 4:30, 5, 5:30,
6, WJZ; 6:30, WBEI; 7:15, WOR;
7:25, WNYC; 8, WJZ;
Wednesday, August 5: 4, 4:30, 5, 5:30,
6, WJZ; 6:30, WEEI; 7:15, WOR;
7:25, WNYC; 8, WJZ;
Thursday, August 5: 4, 4:30, 5, 5:30, 6, WJZ; 6:30, WEEI; 7:15, WOR;
7:25, WNYC; 7:45, WEEI; 8, WJZ;
Frieday, August 7: 4, 4:30, 5, 5:30, 6, WJZ; 6:30, WEEI; 7:15, WOR;
7:25, WNYC; 8, WJZ;
Frieday, August 7: 4, 4:30, 5, 5:30, 6, WJZ; 7:15, WEEI, WOR;
T25, WNYC; 8, WJZ.
Frieday, August 7: 4, 4:30, 5, 5:30, 6, WJZ; 7:15, WEEI, WOR; 7:25, WNYC; 8, WJZ.
Fastern Standard or Central Day-

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

Eastern Standard or Central Daylight Saving Time Stations

Saturday, August 1: 2, WGY; 2:30,
KDKA: 2:45, KDKA, WMAQ; 3:30,
KDKA: 2:45, KDKA, WMAQ; 3:30,
KDKA: 4:46, KDKA, WWJ, 4:46, AB,
KDKA, KYW; 5:45, WHC; 6: WGN,
WLS: 6:50, WTIC: 7, KDKA, WTIC:
7:30, WEBH, WLW; 9:55, KDKA,
Sunday, August 2: 6:30, WBZ; 6:55,
WTIC: 9:50, WBZ.

Monday, August 3: 2, WRC; 2:45,
WAAQ; 3:30, KDKA, KYW; 5, KDKA,
KYW, WAAR; 3:55, WWJ; 4, KDKA,
KYW, WAAR; 3:55, WFIC: 6, WGA,
WEBH, WLW; 9:50, WBZ; 3:55,
WDEAR, WLW; 9:50, WBZ; 3:55,
WEAR; 3:45, WEAR; 3:55, WWJ; 4,
KYW, WMAQ; 4:30, KYW; 5, KDKA,
KYW; 6:45, WBZ; 3:55, WWJ; 4,
KYW, WMAQ; 4:30, KYW; 5, KDKA,
KYW; 4:50, WBZ; 3:50, WHZ; 4, KYW; 6, WGN, WLS; 6:30, WBZ; 7, KYW; 6, WGN, WLS; 6:30, WBZ; 7, KYW; 6:45, WMAQ; 3:30, KDKA, KYW; 6:50, WHC; 7:45, WAAQ; 3:45, WBZ; 7, KDKA, KYW; 6:50, WBZ; 7, KDKA, KYW; 6:50, WGZ; 7, KDKA; 7, KDKA

KDRA; 7:30, WEBH, WLW; 9:30, WEZ; 9:55, KDKA.

Thursday, August 6: 2, WRC; 2:46, WMAQ; 3, KDKA, KYW; 7:30, KDKA, KYW; WEAR; 3:55, WEAR; 3:46, WBZ; 6:30, WTIC; 7:30, WEBH, WLW; 9:50, WEIC; 7:30, WEBH, WLW; 9:50, WEIC; 9:50, WEIC; 9:50, WEX; 9:55, KDKA.

Friday, August 7: 2:30, KDKA; 2:46, WMAQ; 3, KDKA, KYW; 3:30, KDKA, KYW; 3:30, KDKA, KYW; 1:30, KDKA, KYW; 4:30, KDKA, KYW; 4:30, KDKA, KYW; 4:30, KDKA, KYW; 5, KDKA, KYW; 6, WGN, KDKA, KYW; 6, WGN,

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, WEBH, 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, 6, WCCO, WDAF, WCC; 20, WOAW; 6:30, WSMB; 9, WCCO; 1:16, KTMA, August 2: 3:30, 4, WDAF, 8, Sanday, August 2: 3:30, 4, WDAF, 6:46, WCCO, WDAF; 5:05, WOS; 6, WCCO, WDAF; 5:05, WOS; 6, WCCO, WDAF; 5:05, WOS; 6, WCCO, WDAF, 5:05, WOS; 6, WCCO, WDAF, WCCO, WDAF, 4:30, WGAA; 3: 3:00, WDAF, WHAS; 4, WCCO, WDAF; 4:30, WGAI; 9, WCCO, WDAF, WCCO, WDAF, WCCO, WDAF, WCCO, WDAF, WHAD, WCCO, WDAF, WCCO, WCMB, WCC

tic hour; 11-12. Ernte Golden and his Hotel Mc-Alpin orchestra, WYC, New York, N. Y. (326), 7:10-7:30 p. m., dance music, the Canadians; 7:33-5, the Canadians; 8:10-8:20, pharms; 9:30-1-10, more measures; 9:30-1-20, more music, 9:30-1-20, more music, 9:30-1-20, more music, 9:30-1-20, more measures; 9:30-1-20, pharms; 9:30-1-20, ph

The content of the co "Child Care," M. P. 'Adams: 10:30-1. Charloy Straight and bis orrhostra: Albert F. Rrown, or "Straight and bis orrhostra: Albert F. Rrown, or "Wish." (244.6), 6:30 p. m., Rainb Enerson, organist: Martin Meier, contratio; 7:15, Revis Cornbusicers' entry encourt; 7:45, fullably time, Aunt School, School

Car company hand; Reo Motor Car company band alected by 0:15, studio program.
WSAI, Cincianati, Dito (328), 7:45 p. m. WSAI Radio chimes; S. Everendy hour of music; O. David WTAM, Citevalnad, Dito (329.4), 6-7 p. m., Hotel Static orsiestra.
WTAM, Citevalnad, Ohio (399.4), 6-7 p. m., Florid Static orsiestra.
WTAM, Citevalnad, Ohio (399.4), 6-7 p. m., Florid Statics, Company of the Consiste books; Harbie Mitra. Pio Harrie, Lillian Bernard, Tony Corcesan, Violet Eaton, Phil Wilcox. Bruth Stitine, Ned Miller, Howe Statics, m., Travelers, Joneleurs; 7:10, Raymand Cantheld, tenor 7: 50, Austin organ company 3:18, Its Gwynett, sortrano: 8:30, "Cannoling in Central and Northern Maine," Henry WWI, Jostefi, Milet, (39,27), 6 p. m., dimer concert: 7, concert from New York.
Central Standard Time Stations
KFAB, Linesia, Neb, (340.8), 6-7 p. m., dimer proKFOM, Beament, Texas (315.8), 7-7:30 p. m., dimer proKFOM, Beament, Texas (315.8), 7-7:30 p. m., dimer pro-

KFRU. Bristow. Okla. (394.5), 10:30-12 minima. no-ling trip.
KFVE, University City. Mo. (250), 5:30 p. m. Diste Rambler orchestra; Walter Colb, vicilinist; Joseph Philic. planist; College entertainers; Olin 'Gitson. Benry Miller, KLDS, Independence, Mo. (441), S p. m., IXL en-terisings.

tertatners.
KTHS. Net Springs National Park, Ark, (374.8), 9:25
p. m. Lawson Reid, organist,
WBAP, Fort Worth, Tex. (475.8), 7:30-8:39 p. m. program.
E. Clyde Whitlock, director; 9:30-10:45, inusteale.

Words and the state of the stat

John L. Knell, director of the lively band of syncopators Knell's Tokio Smell's Smell' conductors the East. Photo. Photo, Colegrove Studio.



WFAA, Dallas, Texas (475.9), 6:30-7:30 p. m., Prens-ley Moore and his Black and Gold orrhestra; 5:30-9:30. Emmet Peck, violinits; 11-12, G. Hayden Junes, tenes, Milwauke, Wis. (275), 6-7 p. m., Arthur WAALE, Consvilla, Ky. (399.8), 7:30-9 p. m., Snuthorn Star Synopotos, WHO, Des Moines, Iowa (326), 7:30-9 p. m., musical program.

Cont., Regina. Can. (250). 8 p. m. Ilingies kiddies; KOA, Denver, Cola. (2322.4), 6:30 p. m., Herbert White and his Silver State orchestra.

Pacific Standard Time Stations

KFOA, Seattle. Wash. (454.3), 6:6:45 p. m., Olympia hotel concert orchestra. 36:45:813. Blundes Department of the Concentration of

### Wednesday, August 5

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

### Atlantic or Eastern Daylight Saving

Time Stations
CNRO: Othwa, Can. (425), 8 p. m., Chateau Laurier
context orchester: Detha De Laumthe. contrailer; A.
(Continued on page 11)

# WOMEN VERSUS MEN FRIDAY AT KOA

### Wednesday, August 5

(Continued from page 10)

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

Effording (Mailins): The Sub-Maria, John Sall, P. J. Laurier dame or occlestra; Chacca Laurier dame or occlestra; Chacca Carlot (Mailins): The Sub-Maria Maria (Mailins): Topic (Mailins): Table (Mailins): Table

Hayes and his Catnay rea Garven came or reversal; S. rectal; 3:30, talk; 10:30, Jack Myers' Missien; S. rectal; 3:30, talk; 10:30, Jack Myers' Missien; WEAF, New York, N. Y. (491.5), 4-5 p. m., Landon's Blasson Heath screnders; F.-1 dibner maste, Waldorf-Astoria; 7-7-30, services, United Synaposus of the State of the State of the State of the Roof orchestra.

WEBJ, New York, N. Y. (27.6), S-2-30 p. m., Clab Rell New York, N. Y. (27.6), S-2-30 p. m., Clab WeBJ, New York, N. Y. (27.6), S-2-30 p. m., Clab WeBJ, New York, N. Y. (27.6), S-2-30 p. m., Clab Catter of the State of the State

with the configuration of the

Eastern Standard or Central Daylight
Saving Time Stations
KDKA, Pittsburgh, Pa. (399.1), 8:45 p. m., Dry Shtz
hour of music.

KDK., Pubaruph, P.a. (1991), 8:45 p. m., Dry Slitz Nord College, P.a. (1991), 8:45 p. m., Dry Slitz Nord College, P.a. (1991), 8:45 p. m., dinner concert, Counters hotel, 7:8. Thera Martens, countralies, Waller D. Barnets, tenor; 9:18:30, midnight rowus; Weller D. Barnets, tenor; 9:18:40, scoret, and college; 1:48:40, and constanting the standard second of the standard sec

Symphony ordelstra.

Symphony ordelstra.

Self. Clevelstand, Dibi (388.4), 7-3 p. m., Hotel Clevelstra.

ERH, Chicago, III. (370.2), 7:30-3:30 p. m., Orlole concert ordestra: baseball scores; book chat, Lawelly, landers; musical bits, Ritlera theuter; 9:30-10:30, Oriole alone ordestra: Ribbert York, energy conss. Correll of Concert and Gooden, songs; Crotel orderstra, revue.

Oriole dance ordestra; Rabert York, thon; sougs, Correll and Gooden, songs; Crotel orderstra, revue.

GES, Chicago, III. (250), 5-7 p. m., classical program: Marie Wirshr; Richard Dale, bartione; Louisc Wyce, soprano; Freda Stoll, coloratura sporsam; Christotte Marie Wirshr; Richard Dale, bartione; Louisc Wyce, soprano; Freda Stoll, coloratura sporsam; Christotte A. m., popular program; Monoliths Servanders ordestra; Erwin Schnödt and Thil Fleening; Gail Bandel, smishing Rif; Coyne Electrical school screnaders.

GN, Chicage, III. (370.2), 6:30-7:30 p. m. Drake conditions of the condition o



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

WHT. Deerseld. III. (299.8). 7. p. m., Al Carney, orpanist: Graving's etting trio; 7:30. Green Newther,
tener; Pauline Sachs, soprano; 8. Kircien Klerker,
Klassies; Jatle musical moments; 8:13, (239. Elme
Klassies; Jatle musical moments; 10:30.
Klassies; Jatle Manner, pianist; 12. Hickey and
Johnson, Eawatian, Ruitarists; Manfred Gottelf, piYillo, Moseheart, III. (202.9), 16:15-125 p. m., dinner
hour concert, Relmont hotel tule; 7:15-5, Musseheart
hour concert, Relmont hotel tule; 7:15-5, Musseheart
Philharmonic ordicestra; Moseheart Junior band;
"Child Care, M. P. Adams; 10:30-1 a. m., Charley
WLS, Chiengo, III. (244-5), 8:30 p. R. Bown, Granien,
erganist; Martha Meier, contratio; 7:15, Rev's Cornhuskers' early concert; 7:15, Julkay time, Aunt
Nartha and Uncle George; S. Perry Lee Hoffaker,
music, Rev's Cornbuskers; 0, fatur moreram, brastuariet; 10-11:30, "A Night on a Plantation"; Rouscont quartet, Selemu Old Judge, clog dancors, bance
WLW, Cincinputt, Othe (422.3), 4 p. m., Shut in program; 7; dinner concert, Hotel Gibson orchestra,
Roiser Visconti director; 7:29, talk, National Farm
Roiser Visconti director; 7:29, talk, National Farm
Roiser Visconti director; 7:29, talk,
WMAQ, Chiego, III. (250), 7-8:30 p. m., Trianon onsemble; Albert Castecker, cellist; Reberce Agolinick,
pianist; Phyllis Harries, soprano; Charles Agne,
WMAG, Chiego, III. (475), 6 p. m., Chicago theater
orgen; 6:30, Jack Chapman's orchestra; 3, Chapman's
semble; Albert Castecker, cellist; Reberce Agolinick,
pianist; Phyllis Harries, soprano; Charles Agne,
Understanders and the control of the contro

/IZ. New York, N. Y. (454.3), 4:30-5:30 p. m. Bel-mont ten music; 7-7:39, Cafe Boulerard orchestra; 7:30-5, Olext Vall triol, 5:30-9:30, Edban hair; 9:30-9:40, Ialk, "Burs" Bacc of New York American; 10:30-11:30, Billy Wynne's Greenwich Village Inn with the state of the state of

chestra: Florence Tenney; Geraldine Dock; opranoi; 23-8, Olouch Vull Irtol; 23-9-20. Kolbon-hours, 9:39-49, 1314; "Buser of New York American; 30-11:30, Blilly Wynne; Gerenwich Vitales Indicators, and the Chestra: House of New York American; 30-11:30, Blilly Wynne; Gerenwich Vitales Indicators, and the Chestra: House of New York American; 30-11:30, Blilly Wynne; Gerenwich Vitales Indicators, and the Chestra: House of New York American; 30-11:30, Blilly Wynne; Gerenwich Vitales Indicators, and the Chestra: House of New York American; 19-12, Fleetwood hotel ordestra: Warfer & Botton Berlin, 19-12, Fleetwood hotel ordestra: Act A, New York, N. Y. (340-7), 8-39-7-30 p. m., mine Golden and his Blotel McAlphin nechestra: S:30-11:30, Lee Wood, entertainer; 9-9-15, A. Warre, the tertaining reporter; 9-30-15-30, Thermiodyne hour, 10-10 central properties; 19-30-15-30, Thermiodyne hour, 10-10 central properties; 19-30-15-30, man restlating reporter; 9-30-15-30, Thermiodyne hour, 19-30-15-30, Warre, the tertaining reporter; 9-30-15-30, Thermiodyne hour, 19-30-15-30, Warre, 19-30-15-30, Thermiodyne hour, 19-30-15-30, Warre, 19-30-30, Warre,

boys: Herbie Mintz, Evelyn Johnson, Art Stiffer, Herbiert Schroeder. WTIG, Hartford, Conn. (348.6), 6:50 p. m., basebell scores. WMJ, Detreit, Mich. (352.7), 6 p. m., dinner concert.

wover.

Central Standard Time Stations

KPAB, Lincoln, Nebr. (380.2), 6 n. m., dinner concert.

Central Standard Time Stations

KPAB, Lincoln, Nebr. (340.8), 6 7 n. m., dinner program; 7.30-2.50, bd. Steffert, asvophonist; Wilhelmann, 7.30-2.50, bd. Steffert, asvophonist; Wilhelmann, 7.30-2.50, bd. Steffert, asvophonist; Wilhelmann, 200. Colonians darce orchestra.

Frid, Payerteville, Art. (798.8) 10-67; C. Addong, 10-67;

KFVE. University City, Mo. (230), 10 p. m. Romains three orderstry studies intertuliners. Act (2748), 0.25 KF18. Het Springs National processing statemental quarter. Processing Springs of the Committee of the C

Mountain Standard Time Stations KFWA, Ogden, Utah (2011), 9-10 p. m., musical pro-kram; 10-11, feature program; KOA, Denwer, Cols. (322-24), 6:30 p. m., Herbert White Mile Silver State Orchestra; 7:50, "Why Kids Lie," and his Silver State Orchestra; 7:50, "Why Kids Lie," Judgu Hen B. Lindoy; Elizabeth Spencer, Molly Spencer: "Timberline, a Forest Frontier," Charles G. Lory; Ben Henry Smith, baritone: "Has the Airplanu Displaced the Battleshtp?" Lieut. C. W. Weitzel.

Lory; Ben Henry-Smith, bartione; 'Has the Atriplane Displaced the Buttlestip' Lieut, C. W. Weitzel. Pacific Standard Time Stations

KFAE, Puliman, Wash, (348.68), 7.308-33 p. m., Jean Secreta, patrials; vecal duest, Alleun Magnitte, Ruth Beart, book tool, Alleu Lindow, Webb; 'Loud Art of Eddyring Oneself,' Rev. Kalph Graves.

KFOA, Seattle, Wash, (484.3), 9-6-25 n. m., Olumie KFOA, Seattle, Wash, (484.28), 9-6-25 n. m., Olumie KFOA, Seattle, Wash, (484.28), 9-6-25 n. m., Olimie KFOA, (484.28), 9-6-25 n. m., Oli

tion Charlie Wellman.

Kol, Oakland, Galli. (361.2), 6-7 p. m. Ben Black's orchestra. (369.5), 5-6 p. m. Lackie Souders' orchestra. (369.5, bas-lad sores, 8-3.6), convect; 10-11. Shorman, Clay and company, consert. (469.5), 5-30-6 p. m., Legislater's Areade cafeteria corchestra, Jack Crosshaw, the Conservation of the Conserv

### Thursday, August 6

Thursday, silent night for: CKAC, CNRT, KFAB, KFAE, KFDM, KFMQ, KFOA, KFUO, KFVE, KFWA, KOA, KSO, FWX, WAHG, WBAY, WCEE, WEAO, WEBJ, WHA, WHAD, WHAZ, WJJO, WKRC, WLIT, WOR, WRBC, WTAM.

Atlantic or Eastern Daylight Saving

Time Stations

CNEM. Mentreal. Can. (411), 5 p. m., orchestra, Write
Sur-Dominion Ind. (411), 5 p. m., orchestra, Write
Sur-Dominion Ind. (411), 5 p. m., orchestra, Write
Sur-Dominion Ind. (411), 5 p. m., orchestra, Write
W. H. Bytgs, cellis, address; J. Rimnard, violusia;
W. H. Bytgs, and J. Warley, Survey, or orchestra, instrumental
music Surday school isseen, S. M. Van Slipma,
S-50, L. Marion Brown, soprano; 8-59, Instrumental
music.

(Continued on page 12)

lar songs.

Og. Philadelphia, Pa. (598.2), 7:50 p. m., Walter
Haethreer, planist; 7:45, George O'Brien, tenor; S,
U. S. Nary bandt; 9, hana Trowhadours; W. Apollo
histrumental trio; 10:50, A. Candelori's dance ordrestro.

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

# 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.

### Eastern Standard or Central Day-

Eastern Standard or Central Daylight Saving Time Stations
Saturday, August 1: 6:20, WWJ; 7,
WEAR; 8, WEBM, WHT, WLS,
WEBM, WITA WEBM, WHT, WLS,
WEBM, WITA WEBM, WITA WEBM,
WEBM, WITA WEBM, WITA WEBM,
WEBM, WITA WEBM, WITA WEBM,
WO,I: 10:30, WCEE, WGES, WHT,
WJJD, WTAM; 11, WEBM, WGES,
WLS, WQJ, 11:20, WCEE, WJD; 12,
WEBM, WHT, WQJ, WSAI; 1;
WEBM, WJJ, WTAM; 2, WTAM; 8,
SHOW, August 3: 0, 50, 20, WMEB;
WEBM, WTAS; 20; 515, WHT; 2:30,
WMEB; 10, WTAS; 10:30, WGES; 11,
WGES, WTAS; 12, WBBM, WJJD; 1;
WGESM, WTAS; 2, WBBM, WJJD; 1;
WGESM, MUJS; 3: 6, WEBM; 8,
MOGRAY, August 3: 6, WEBM; 8,
MOGRAY, August 3: 6, WEBM; 8,

WHEE, IN. WARS, 10.30, WEBS, 11, WBBM, WJJD, 1, WBBM, WJJD, 1, WBBM, WJJD, 1, WBBM, WJJD, 1, WBBM, WJAS, 19.30, WLAZ, 10.15, WHT, 10.30, WCEE, WJJD, 11, WHT, 11.30, WCEE, WHJ, WJJD, 12, WHT, WJJD, Tuesday, August 4: 8, WBBM, WTAS, 8:30, WBBH, WBBM, WTAS, 8:30, WBBH, WBBM, WTAS, 8:30, WBBH, WGBM, WHT, WTAS, 9:30, WBBH, WGBM, WGBM, WLS, WBBM, WGBM, WLS, WBBM, WGBM, WHS, 12:20, WEGM, WJJD, 1, WBBM, WHS, 12:20, WEGM, WJJD, 12, WHEO, WLS, 12:20, WEGM, WJJD, 12, WBBM, WHS, 13:30, WBBM, WMBB, 10, KYW, WHT, WHSO, WGM, WGBM, WGBM,

### Central Standard Time Stations

Central Standard Time Stations
Saturday, August 1: 6:30, WFAA;
7. KSD; 8:30, WOAI; 9, KFRU; 9:30,
WSAIB; 10, KFRU, 8, KFVE; 10:45,
WSB: 11, KFAB, KFRU, KFVE;
WOAW; 11:45, WDAF;
Sunday, August 2: 9:30, WFAA,
WMOAW; 6:45, WCCO; 7:30, KFAB; 8,
KFAB, KFRU; 8:30, KFAB, WAC,
WOAW; 145, WDAF; 9, KFRU; 9:30,
WSAB; 10, KFVE, WOAW; 10:45,
WSB; 11:45, WDAF;
THOSAIQ, AUGUST 4: 6:30, WOC, 8,
WCO, WSE, 3:30, WOAI; 10:30,
KFRU; 8:30, KFAB, WSMB; 10, KFRU; 2; WOAW,
Wednesday, August 5: 7:30, KFAB,
KFRU; 8:30, KFAB, WSMB; 9,
KFRU; 8:30, KFAB, WSMB; 10,
KFRU; 8:30, KFAB, WSMB; 10,
KFRU; 8:30, KFAB, WSMB; 10,
KFRU; 8:30, WOAI; 6:30,
WCCO; 8:30, WOAI; 9, WOAW,
WCCO; 8:30, WOAI; 9, WOAW, 8,
WCCO; 8:30, WOAI; 10, KFRU; WMC; 11,45, WDAF; 12, KFRU; WMC; 11,45, WDAF; 12, KFRU;
Mountain Standard Time Stations

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

Friday, August 7: 9-11, KFWA. Pacific Standard Time Stations

Pacific Standard Time Stations
Saturday, August 1: 8, KFWB,
KNX, 6:30, KTCL, 10, KFI, KFWB;
KNX, 6:30, KTCL, 10, KFI, KFWB;
LINN, 12:30, KFIL, KHJ, KFICL; 12,
KFWS, 10, KFWB, LINN, 10, KFYB; 10, KFWB, 12, KFWB,
Monday, August 2: 8, KHJ; 9,
Monday, August 4: 8, KFWB,
KNX, 11, KFWB, LI, KFWB,
KNX, 10, KFWB, KNX, 10, KFWB,
KNX, 11, KFWB, KNX, 10, KFWB,
KNX, 11, KFWB, KNX, 10, KNX, 11,
KFWA, KFWB, 11, KNX,
Thursday, August 6: 8, KHJ; 9,
KHJ; 10, KFWB, KHJ; 11, KNX,
Friday, August 7: 8, KFWB; 9,
KFWB, KHJ, KNX, 10, KFWA,
KFWB, KHX, 10, 13, KFWB,
KFWB, KHX, 10, 13, KFWB,
KFWB, KNX, 10, 13, KFWB,
KFWB, KNX, 10, 13, KGW; 11,
KFWB, KNX, 10, 13, KGW; 12, KFWB,
KNX; 1, KNX



Elmer MoDonald, besides being a baritone and bachelor, is reported to have a charming personality. However, he is very hard to catch, because he nover stays more than a week in the same place. At the present time he is somewhere between WSB and WMC, Memphis, and expects to he in St. Lonis soon.

Rothes, septano: Beulah Leóon, valultist; 11:30-1, Oriois dance orchestra: Paul Smail, songster: Katherine Feptus, songrano; stories, Wayne Myers.

W6ES, Glicago. III. (220), 5-7 p. m. chasted moreover, barrione: The Paul Smail, songster: Katherine Feptus, Battern, sonrano; Anna Wallace, accompanist; Elsie Barce, rianist; 10:30-1 a, m., popular mercarun. Phill Wilex, symenosist; Pat Ward and the mercarun. Phill Wilex, symenosist; Pat Ward and Curse Electrical school secrenation.

Geo. 10:40-10

Woyne Directions as sense. 200 p. m. Drake concent casemble. Blackstone atting quintity 830-930,
studiol program, 10:30-11:30, Drake Hotel Terrace
Garden program, N. V. (279.5), e.35, p. m. "The
Camper's Bag of Tricks;" 6:45, Ruth Don, plants;
7:30, Marris band; 9, 'A Tric Through South Amcricut, Junus A. Leary.
WHT, Deerfield, III. (898-8), 7 p. m. Al Carner, orgening, Grayling's vicing irio, '130, Tenry Corcuration
WHT, Deerfield, III. (898-8), 7 p. m. Al Carner, orgening, Grayling's vicing irio, '130, Tenry Corcuration
WHT, Deerfield, III. (898-8), T. p. m. Al Carner, orgening, Control of the Corcuration of the Corcuration
S. Jelke musical mountain; vilkiens and Martins, Harmony duo; S:45, (228), Eliper Kalser's Riverries
J. S. Jelke musical mountain; wilkiens and Martins, Harmony duo; S:45, (228), Eliper Kalser's Riverries
J. S. Jelke musical mountain
Li S. Jelke musical musical musical musical musical
Li S. Gestrude Mugford, soprangi Walter Ford's
Cheerfo arrhants; Li Calays Weefforth, contratio, S. 8-55, Beter Music hour; Wm. Hayden, tenor; Addison Brizoo,
WLW, Cincinnatt, Ohis (422, 8), 7 p. m., Minner concert.
Bottel Gibban orchestra, Robert Viscondi; S. Sectionary
Hawiting; J. Girree-minute, message, Chill Service
and dance procram, Deberry Mesody boys; 10:46, orcansolos, Rosemay Electrock; 10:45, concert, WLW orweeter.

and dance procram, Deberty Meidely Boys; 10:30, organiolo; Nosemary Ellerorock; 19:35, onnert, WLW orselois, 70; Mark, Lekport, M. Y. (285.5), 11 p. m., Murray Whiteman, Buffulo, N. Y. (285.5), 11 p. m., Murray Whiteman, Buffulo, N. Y. (285.5), 11 p. m., Murray Whiteman, Buffulo, N. Y. (285.5), 11 p. m., Murray Whiteman, Buffulo, N. Y. (285.5), 12 p. m., Murray Whiteman, Buffulo, 19:10, 11 p. m., Murray Whiteman, Buffulo, 19:10, 11 p. m., Murray Whiteman, 19:10, 11 p. m., New York studies, Murray Murray Jane; 12, Ginger hour.

Atwester Kent Hadde Artists; 9, Silvertown Cord orWTAM. Cleveland, Ohio (389.4), 6-7 p. m. Hotel
Statics orchestra.
WTAS, Elgin, Herbist, 1802.8), 8-2 midpight, Purple
WTAS, Elgin, Herbist, 1802.8), 8-2 midpight, Purple
Hinchie, Fio Henrie, Lilian Bernard, Phil Wilcox,
WTHOS, Silver, Conn. (348.6), 8 p. m., Emil Heinberger; Hotel Bend trio, Exther Koldon, soprano; 8-50,
haschall; 6-53, dinner most,
WWJ, Defroit, Mich. (352.7), 6 p. m., dinner concert;
7, concert from New York,

Central Standard Time Stations

Contest four vew fuls.

Contest four vew fuls.

CNEW, Winnipee, Can. (384.4), 9 p. m., dance profree for protect for Mrs. B. J. 3.

Contest for for Carry head thro Mrs. D. J. 3.

Ref. Contest.

Ref. Sept. Sheamada, Issue (268), 7:30 p. m., concert,

Ref. Sheamada, Issue (268), 7:30 p. m., concert,

Ref. Contest.

Ref.

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

WHO, Des Moines, lowa (526), 7:30-9 p. m., Leon Dashoff and his symptonic orchestra; 11-12, dance

MUSIC.

VOAW, Ómaha, Nebr. (526), 6 p. m., popular pre-gram: 6:20 baseball; 6:25, to be annumeed: 6:45, Randall's Royal Fontenelle orchestra; 9, De Lawe program.

program.

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

Weilman.

KGO. Ozkland, Calif. (361.2). S p. m.. "The Thirteenth Chair," lirec-act drama, KGO players; 16-1
a. m., Clarko Wilsun's Hotel St. Francis dance orchestra.

a. m., Clarko Villsun's Hotel St. Flumer Gallet, Chestra. Chestra. KGW. Partland, Orc. (491.5), 7:30-8 p. m., baseball scores: 8-9, concert; 10-12, Kenin's Multnomah hotel orchestra.

Multinomah hotel orthestra. KHJ, Los Angeles, Calif. (405.2), 5:50-6 n. m., Leichton's Arcade cafeteria orthestra. Jack Crousbaw, leader; 6-6:30. Art Hickman's Biltimore huele concert orthestra. Edward Filtenatriek, director; 0:30-7:30, Radio binder's hour, Dickle Braudon, serces juvenité. Plegy Wiggly Girls stringed trio, Unels John; 8-10, program, Din Biel, Lundry company, arrunced by J. Boward Din Biel, Lundry company, arrunced by J. Boward orthestra, Earl Borney Hotel, Biltimore hotel dance orthestra, Earl Borney Lundry.

orchestra, Earl Burnett, bases, 2016

Silvertown Cont w York, Atwater Kent issult Artists;
Silvertown Cont orchesters.

W.D.A.F. Kansas City, Mo. (385.8), 6-7 p. m. piano
Stury lady; Flantadorf Control of Control of Control
Stury lady; Flantadorf Silver Control
W.F.A. Dalins, Texas (475.9), 6:30-7:30 p. m., Hauuter
School of Hawaiian music, 3:30-8:30, Framer's fronte,
School of Hawaiian music, 3:30-8:30, Framer's fronte,
Control Diology, Silver Control
Con

Mistor and mis symptomic orchestra; 11-12, dance Wid, Mcmohis, Tonn. (499.7), S:30 p. m., Price Barwick company. WOAI, San Antonio, Tex. (304.5), S:30-0:30 p. m., Menuor botol iclo; 0:30-10:30, Jimmy's Joys dance music.

WSMB, New Orleans, La. (319), 6:30-7:30 p. m., en-tertalnment; 8:30-16:30, New Orleans Harmony Kings; Sunshine Twins.

Mountain Standard Time Stations
(0A. Denver. Cole. (322.4), 6:30 p. in., dinner concert. Berbert White and his Silver State orchestra; 8, Denver immleipal band.

Pacific Standard Time Stations Pacific Standard Time Stations
(FWB, Hellywood, Calif. (2522), 7:40 p. m., Flating
steams and fish, Jack Boaz, fishing sout; 7:45, plassteams and fish, Jack Boaz, fishing sout; 7:45, plassteams and fish, Jack Boaz, fishing sout; 7:45, plasland plastic states and states and plastic states and

### DANCING

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Tuesday, August 4: 8,
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### Thursday, August 6

### (Continued from page 11)

VCAE, Pittsburch, Pa. (461.3), 6.30 p. m., dinner concert, William Penn hetel; 8, studio concert; 0, Acwater Kent Radio artists; 10, Goodrich Silvertown Cord crehestra. France Pittsburghin, Pa. (278), 6.30 p. m. Billy CAU, Pittsburghin, Pa. (278), 6.30 p. m. Billy France Pittsburgh

trial, 9, tass, aussiege franchesita record; 10:30, tested and in Schlary Test Gardien dance or chestra, record of the first process of

sical scores of "The Birth of a Nation," Pleadilly Wheeler of the Birth of a Nation," Pleadilly Wheeler of the Program of the Williams and the state of the s

loti's connect orchestra.

WOR. Newark. N. J. (405.2), 6:15-7:15 p. m., Tom Canger's Country club orchestra; 7:15-7:30, sports talk, Bill Wathey.

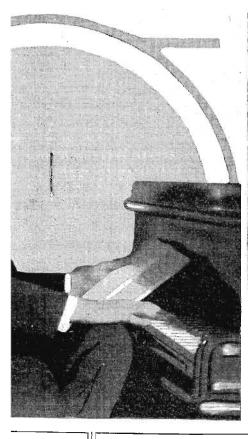
talis, 2011 Wathey.

Eastern Standard or Central Daylight
Saving Time Stations

KDKA, Pittsburgh, Pa. (308.1), 8.35 D. m., concert;
10.15, concert, Willows, Oakmunt.

10.15, concert, Carlo, C

# OLD TIME POPULAR SONGS AT WAHG



Friday, August 7

Atlantic or Eastern Daylight Saving
Time Stations
CNRT, Terento, Can. (357). 6:30 p. m., Luigt Romanelli and his King Edward Intel concern of the control of

winders.

WJAR, Providence, R. I. (305.9), 8 p. m., musical program; 9, Maine Creamery hour; 11, Providence Bitternore dance orchestra.

### DANCING

DANCING
Central Standard Timo
Saturday, Anaust I: S.
sw. Wys. Winbb, Wins-2
55. Winb S. 30. Webb,
205. Winb S. 30. Webb,
206. Winb S. 30. Webb,
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Lad, Wind, 11.

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193. Wild. 11-15.
Tuesday, August 4: 8
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S. Wung, S. Ship, S. Ship, S. 19
S. Wung, S. Ship, S. Ship, S. 19
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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 WHEM.

8:15, Emmett Wehlt Minstrele; 10, Moraing Glory club concert; Arcmila enfe dance orchestra; Scage by Refus and Rassus; Coon Saniners' Mighthawks and McMcA, New York, N. Y. (340-7), 6:309-7;300 p.m. Ernite Golden and his Hotel McAlpin orchestra; 8-309, tells, W. Curtis, Netholono, author of "The Right Hardman hour of music; 10-10-15, Raymond Maher, bartione; 19:00-11:30, Manhattan serenceter.

WNYO, New York, N. (629), 5:40 p. m., French less than the series of the series of

Eastern Standard or Central Daylight

KDKA, Pittsburgh, Fa. (891), 8:45 D. m., concert.

KDKA, Pittsburgh, Fa. (893,0), 8:45 D. m., concert.

KUW, Chiller, S. (893,0), 8:45 D. m., concert.

KUW, Chiller, S. (893,0), 8:45 D. m., concert.

KUW, Chiller, S. (893,0), 8:45 D. m., concert.

WBBM, Chicago, III. (226), 8:10 D. m., Sumory or
chetta; Supplerd Levince; Jerry Cromack, Charlis

Molnaire; Al Furry, Lank, and Sandy Atcek; William

Molnaire; Al Furry, Lank, and Sandy Atcek; William

Molnaire; Al Furry, S. 49 D. m., back porch bour;

MEC, Seriolafel, Mass. (303,1), 6: m., Hotel Kimbull

MC, Seriolafel, Mass. (303,1), 6: m., Hotel Kimbull

Florence Pratt, sonrano; 3:15, to be monocoloris, S.

Florence Pratt, sonrano; 3:15, to be monocoloris, S.

Florence Pratt, sonrano; 3:15, to be m., concert;

Sonrano; S. (804, M.), 10:30-12, mindett, Purple

Grackin orchestra, artiste.

WCA, Retroit, Mich. (516,9), 4:15 D. m., concert;

Symphony orchestra, book-Cadillae hotel; S. Detroit

Symphony orchestra, hour; S. (804,4), 7:8 p. m., bildrent;

Near, C. (804,401,401), 10:20, 7:268-290, p. m., bildrent;

NeBH, Chilera, III. (327), 7:268-290, pp. Octor.

Cambria's 0-86-20, Radio Ray Ray: 10-10:15, Radio Cambria's 0-86-20, Radio Ray Ray: 10-10:15, Gene Content 10:35-11:20, Gene Content 10:35, Fact More Technology 10:35, Fact More Technology 10:35, Fact More Technology 10:35, Fact More Technology 10:35, Fact More More

6. dinner concert. Book-Cadillao notel; 8. Detroit of the concert has a constraint of the content of the conten

stan; 3, Maino Creamery hour; 11, Providence Bill-more dance orchestra. WJY, New York, M. Y. (405.2), 8:30-9:30 p. m., New York university cement; 9:30-10:30, United States Navy pressum. M. Y. (454.3), Y-3 p. m., Sayarin ne-sembles 8:40, Wall Street Journal rordine; 3:10-8:30, NUU Air college; 10:30-11:30, Ben Glaser's orchestra with Fay Mathe. WLIT, Philadelphia, Pa. (394.5), 7:30 p. m., Dream Daddy's bestline stories; 8, Com Sanders Nighthaw's and Charles Frey's Million Dollar Pior orchestra;

### 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

Atlantic or Eastern Daylight Sav-ing Time Stations

ing Time Stations

Saturday, August 1: 6. WEAF;
6:05, WIP; 6:30, WCAE; 6:45, WPG;
7, WEAF, 7:30, WEAF, WGBS; 7:45,
WGR; 8; WEAF, WBBR, WHAR,
WIP, WNYC; 8:05, WPG; 8:10,
WGBS; 8:15, WNYC; 8:25, WJZ;
8:30, WCAF, WCBS; WIP; 9,
WGBS, WEAF; 8:50, WIP; 9,
WGBS, WFG; 9:50, WGBS; 10:15,
WEAF; 10:30, WEAF,
Sunday, August 2: 6. WOO; 6:30,
WCAE; NUZ; 7:20, WCAE; WEBF,
8:30, WEEI, WJY, WJZ; 9, WEBF,
WHAR; 9:15, WCAE, WEAF, WEDI;
11, WHAR

WHAR, 9:15, WCAE, WEAF, WEDN;
11, WHAR,
MODIAY, August 3: 6, WEAF,
WGR: 6:05, WIP; 6:30, WCAE; 7:15,
WEAF; 7:30, WAHG, WEEL: 8,
WAHG, WBBR, WEEL WGR,
WHAR, WOO, WOR; 8:16, WNYC;
8:30, WBBR, WCAE, WIZ,
WOO; 8:46, WEAF; 8:50, WBBR; 9,
WLIT: 9:15, WAHG, WMCA; 10,
CHNC; 10:15, WEAF, WOO; 11,
WHA.

WLIT: 9:15. WAHG. WMGA: 10.
CHINC: 10:15. WEAF, WOG: 11.
WHN.
Thesday, August 4: 6. WGR: 6:05.
WIP: 6:30. WGAE: 7. WGAF, WGR:
WAR. WN WT:15. WJZ: 7:30. WGAU.
WCAE: WCAU.
WEAF, WGAU.
WCAE: WCAU.
WEAF, WGAU.
WCAE: WCAU.
WCAE: WCAU.
WCAE: WCAU.
WCAE: WCAU.
WGBS. WCAU.
WGBS. WCAE: 10. WGAE: 9:30.
WGR. WMCA: 10. WCAE.
WEAF, WEEI. WFI. WGBS: 9:30.
WGR. WMCA: 10. WCAE.
WEAF, WEEI. WFI. WGAE: 9:30.
WGR. WMCA: 10. WCAE.
WEAF, WEEI. WFI. WGAE: 9:30.
WAAF, WEEI. WFI. WGAE: 9:30.
WCAE.
WAAF, WGBS. WCAE: WGAF,
WGR.
WAAF, WEBI: 9. WEAF, WEEI.
WGBS. WOO: 9:30. WCBI, WMCA:
10:15. WOR.
Thursday, August 6: 6. WEAF,
WGBS. WOO: 9:30. WCBI, WMCA:
10:15. WOR.
Thursday, August 6: 6. WEAF,
WGBS. WOO: 9:30. WCBI, WMCA:
10:15. WOR.
Thursday, August 6: 6. WEAF,
WGBS. WOO: 9:30. WCBI, WMCA:
10:15. WOR.
WHEI! WGAE.
WHOAF, WEBI WHAR: 8.
WONEY: 9. WGAE.
WHAR: 8:30. WCAE.
WGR. WHO: 8:35. WWCAE.
WGR. WHO: 8:35. WMCA: 10.
WGAE. WHO: 8:35. WMCAE: 10.
WGAE. WEEI!. WJC.
Friday, August 7: 6. WBAF, WGR.
WGAE. WEEI!. WJC.
Friday, August 7: 6. WGAF, WGAF,
WGAE. WEEI!. WJC.
Friday, August 7: 6. WGAF, WGAF,
WGAE. WEEI!. WJC.
Friday, August 7: 6. WGAF, WGAF,
WGAE. WHEI!. WJC.
WHAR: 8:15. WNYCE: 8:26. WGAF,
WHAR: 8:15. WNYCE: 8:26. WGAF,
WMCAA. WOO: 10:45. WHAR: 11.
WHAR:
Eastern Standard or Central Day-

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

Saturday, August 1: 6, KYW, WCX, WIBO, WGPS, WMAQ, WTAM; 6:30, WGN; 6:46, WJJD; 7, KYW, WHT WIBO, WMBB, WQJ; 7:15, WJJD; 7:25, WGY; 7:30, WRC; 7:25, KYW; 7:46, WLS; 8, WORD, WSAI, WTAM; S:16, WSAI, WWJ, 3:30, KYW, PWX, WGN; 8:45, KDKA; 9, WMAQ; 9:16, WSAI,

WEZ; 10:30, WHT.

Central Standard Time Stations
Saturday, August 1: 6, KFAE,
WH 6:30, WCCO, WFAA, WSMB:
7:30, KWFAA, WSMB:
8:30, WFAA, WSMB:
8:30, WFAA, WGCO, WSE:
8:30, WFAA, WGC, WSE:
8:30, WFAA, WGC,
Sunday, August 2: 6:30, KLDS;
CYW 9, WOAN, WGC,
Sunday, August 2: 6:30, KLDS;
7:30, WHO; 8, KFPDM: WCBD, WGC,
9, WOAN; 9:15, KLDS, WCGO, 9:25,
KTHS; 9:30, WGC; 10, KFVE; 10:30,
WGC.

KTHS.

Mountain Standard Time Stations
Monday, August 3: 6:30, KOA; 8,
KOA; 9-11, KUWA,
7:30, KOA,
Wednesday, August 5: 6:30, KOA;
8, KOA; 9-11, KFWA,
Thursday, August 5: 6:30, KOA;
8, KOA; 9-11, KFWA,
Thursday, August 6: 6:20, 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,

NOA.

Pacific Standard Time Stations
Saturday, August 1: 6, KFOA, KH1;
6:30, KNX; 6:45, KFOA; 7, KNX;
7:30, KNX; 8:10, KGG; 8:15, KHJ,
Sunday, August 2: 6:30, KH1; 6:25,
KFO; 7, KH1, KNX; 8, KNX, KFO;
9, KNX; 10, KNX.
Monday, August 3: 6, KFOA, KGG;
6:30, KNX; 6:45, KFOA; 7:30, KNX;
9, KTCL.

6:30, KNX; 6:45, KFOA; 7:30, KNX; 9:40, KNX; 9:40, KNX; 9:40, KNX; 9:40, KNX; 1:40, KNX; 1:40, KNX; 8:40, KNX;

Trianon orchestra; Iack Mernane, baritone; Woodlawn theater orchestra; Morey Alswang, banjoist; Florence Bahy Blues Tenney; Clyde Hager.

WMBF, Miami Beach, Fla. (384.4), 7-7:30 p. m. studio concert; 7:30-8, dance music; 10-12, Fleat-wood hotel orchestra.

study ettor, S. pece Leviton, Anno Spiegel, plano solos, ducts.

42 Chiese III. (447-5), 7-8 n. n., Bairbo Gardens Signitari, Watchiese Villageria, Andre Ray "Tollisti", 1041 Michael Cardens Signitaris, West Brothers; William Richardson, baritones; Paul Sanall, tenor; Jack Lazin, tenor; Ireno Fluucan, soprano; Antia Chellis, contraitic; Floso Quidn, contraito; Elemon Terry; Marie Polictaci, Glennor Terry; Marie Polictaci, Leanner Cardens, Cardens Cardens, Ca

Tommy Dunlap, Brock Sisters, Art Stiller, Walter Donovan.
WTIC, Hartford, Conn. (348.6), § p. m., Travelers',
Jonnleurs; § 530, baschull; 7, Travelers', Jonnleurs;
1310, Edward, S. S. Lind, Lass; 7.55, Dorochy, At1310, Edward, S. S. Lind, Lass; 7.55, Dorochy, AtHatch; § 530, Emil Heinberger's Hotel Bond orthestra.
WWJ. Delroit, Mich. (332.7), § p. m., dinnor coacert; S. Goldman band concert; Ø, Orange Bissoni's
err; S. Goldman band concert; Ø, Orange Bissoni's

Central Standard Time Stations

KFAB, Lincoln, Nabr. (340,6), 6-7 p. m., dinner program; 7:36-5, Roy P. Knolls and his Blue Moon Mrs. Muser, contains Granithe Minderer, speaking 80-260, Geralithe Minderer, speaking series, Mrs. M. E. Dunley, plants; H. F. McCulla, bartione; Colonian, dance orelastra.

# An Evening at Home with the Listener In

### STATIONS IN ORDER OF WAVE LENGTHS USED

Meters Call	Meters Call			Meters Call	Meters Call			
226 WBBM	278 KOIL	315.6 KFDM	365.6 WDAF	405.2 WOR	468.5 WCAP			
226 W1BO	278 KWWG	1315.6 WAHG	365.6 WHB	406 WBAR	468.5 WRC			
240 KEVE	278 WCAU	315.6 WGBS		410.7 CKAC	475.9 WBAP			
243.8 WAMD	278 WLBL	319 WGR			475.9 WEE1			
		319 WSMB		416.4 WCCO	475.9 WEAA			
	278 WRBC	322.4 KOA		421 KIAF	480 CYL			
250 WMBE	280.2 WNAC	325.9 WSAI		422.3 WLW				
252 KFWB	282.8 WOAN			428.3 WSB	483.6 WOC			
252 WGCP	285,5 WKAR	326 WKRC		428.3 KPO	1483.6 WSUI			
261 KFWA	285.5 WREO	330 CYX			491.5 KGW			
265.5 WMAK	293.9 KJS	333.1 WBZ			491.5 WEAF			
266 KFNF	293.9 WBAV	336.9 KNX			499.7 WMC			
266 WBCN	293,9 WEAO	340.7 WKAQ		435 AT9				
		340.7 WMCA		434.5 CFCN				
272.6 WEBR	296.9 KPRC	340.8 KFAB	394.5 KFRII	440.9 KLDS	508.2 WIP			
272.6 WEBJ	299.8 KFMQ	344.6 WCBD	394.5 WF1	440.9 WDWF	508.2 WOO			
272.6 WFEH	299.8 KSL	344.6 WLS		440.9 WOS	516.9 CJCA			
273 WRW	299.8 WPG	348.6 KFAE	394.5 WLIT	447.5 WMAQ	516.9 WCX			
275 KFAU	302.8 WJJD	348.6 WTIC	394.5 WOAL	447.5 WQJ	526 WHO			
275 WCAC	302.8 WTAS	352.7 WWJ	399.8 WHAS	454.3 KFOA	526 WNYC			
275 WHAD	305.9 KTCL	356.9 CFCA	399.8 WHT	454.3 WJZ	526 WOAW			
275 WHAR	305.9 W.TAR	356.9 CHNC		455 KTW	535.4 KYW			
275 WORD	309.1 KDKA	361.2 KGO		461.3 WCAE	545.1 KFUO			
275.3 WJAS								
215.0 WJAS	1313 CNKA	1 20 1.2 W FILV	T L W a.corr	467 KFI	545.1 KSD			

### 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; Bastern, 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. Can also use Contral time table by subtracting one hour for every figure given.

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

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

# pany: 7:30-8, program of musical gens, Eastern Out-fitting company; 8:9, West Coast theaters by remote countril, 9:11, KRX, Easter program, 1:12, Abe the company of the company of the con-passador botch. Grove dance orchestra from Am-bassador botch. (4:28.3), 6:13, p. m., Loew's Warfield theater program; 7:7:39, Palace hotel con-cert orchestra; 8:11, Palace hotel con-

### Friday, August 7

(CF)M. Besument, Tex. (315.0), 3-10.39 p. m., Magnella Petraleum company's Refinery band. R. Concert, Concert,

chestra. CCO, Minnesselis-St. Paul. Minn. (416.4), 6:15 p. m., George Oshors's Nicollet hotel orchestra; 3, Gordon on guagamble.

(F. Kanasa City, Ma. (368.6), 6-7 p. m., Kanasa City, Ma. (368.6), 6-7 p. m., Kanasa City, Children's burcau; Tell-Me-a-Story lady; Planta n placety, 8-7-20, popular material piogram; 11:45-1 proposed program; 11:45-1 proposed program; 11:45-1 proposed program; 2014 Albiette chib orchestra; Charles Dornberger near City Albiette chib orchestra; Enards Dornberger near City Albiette chib orchestra; Enard Coleman.

Commans City Attender Cition Concentral; Leart Colemans Wilderford, and the Constitution of the Constituti

WHAS, Luisville, Ky, (200.e.; 1.00-2.
cert, nespecte Louisville Nusis and Italia company
Sura King. Months, towa (526), 7:30-9 p. m., talk,
Capitale Phillius; Shope Pizza nerclestra; A. E. Lane,
And Capitale Phillius; Shope Pizza nerclestra; A. E. Lane,
M. Months, Tomostar, 1. midmissin toite.
WOAL San Antanio, Tex. (394.3), 8:30 p. m., Brettling's
WOAL San Antanio, Tex. (394.3), 8:30 p. m., Menger
hold (10).
Horse Piroson Copper; 8:30, basebull; 6:25, to be
amounted; 6:10, Gilbert, Jany and Mis orbesters,
dimmissing of the Company of the Company
WOG. Diverse Processor, 1. mid-stale,
WOG. Divers

tertsument, twiliatt tales.

Mountain Standard Time Stations
KFWA, Onden, Utak (261), 9-10 p. m., studio program
10-11, Rainiboue dance rechestra.
KOA, Denver, Coln. (322-4), 0-30 p. m., Herbert White
and his Silter Silte orrhestra; 1-30, Recht of Knowl
odec; S. Ewa 200e, Curlmon Banch, Cecil Brierly
Hillatt Herber Blowards. Heritz Davidson.

Hulad Helen Edwards, Menriz Davidson.

Pacific Standard Time Stations

KFAE, Pullman, Wash. (348.6), 8:15 p. m., "The
First Year," submits of special telapartment

KFOA, Seattle, Wash. (454.3), 6-5:15 p. m., baseball
results. Olympic hotel concern ordering (545-53).

Sherman, Clay & Co., presurent, 8:30-16. Seattle
music, 100 p. 100-211. Olympic hotel, dame.

KGO. Oakiand Galif. (361.2), 6-7. n. ..., Ben Black's crobests.

KGW. Partinal. Ore. 1911.51, 7:30-3. n. n. baschold.

KGW. Partinal. Ore. 1911.51, 7:30-3. n. n. baschold.

KHJ. Los Augulets, Galif. (302.2), 5:30-6. n. n. Leith
Londor; 6-6-50. Act. Hickman's Billimore hold converted.

dio kitdilea' hout. Adventures of the Browns (3rd epilades). pupils of Edyl McGrath. Playle Wiley Hawvillan tric. Yyok Von. serven starlet. 7:36. Ro
myllan tric. Yok Von. serven starlet. 7:38. Ro
myllan tric. Yok Von. serven starlet. 7:39. Ro
myllan tric. Yok Von. serven starlet. 7:30. Ro
myllan tric. Yok Von. serven st

# KGO BANS SWISH,

### Teachers on Radio Classroom Instruction Schedule Must Pass Rigid Examination

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

### (FOR PACIFIC TIME)

AVE LENGTHS USED				(	FOR P.	ACIFIC	TIME)				
rs Call   Meters Call   Meters Call	Call	Met.	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Mat.	Call
WDAF 405.2 WOR 468.5 WCAP WHB 406 WBAR 468.5 WRC	AT9 CFCA	435 356.9	Silent S	3:00- 4:00 4:00- 5:00	Silent Silent.	Silent 5:15- 6:15	Silent 5:15- 6:15	5:00- 7:55 5:15- 6:15	Silent Silent	435 356.9	AT9 CFCA
WEBH 416.4 WCCO 475.9 WEEL	CHNC	434.5 356.9 516.9	9:00-11:00 Silent	Silent Silent	Silent 4:30- 5:30 6:30- 8:30	Silent Silent	Silent	7:00 8:00 Silent	Silent Silent	434.5 356.9	CFCN
WGN 421 KIAF 475.9 WFAA   KTHS 422.2 WF.W 480 CYL		410.7	8:00-10:00 4:30- 0:30	6:30- 7:30 1:30- 2:30 5:00- 7:45	Silent Stlent	6:30- 7:00 4:30- 9:30 6:30- 8:45	5:00- 7:00 Silent	8:00-10:00 4:30- 9:30 6:00- 7:00	7:00-11:00 Silent 6:30-7:45	516.9 410.7	CKAC
WHAZ 428 2 KPO 483.6 WSUI	CNRA	313 434.5	Silent Silent 4:30-9:80	Silent	Silent	4:30- 5:80 Silent	Silent Silent 4:30- 9:30	Silent	4:30- 5:30 Silent	384.4 313 434.5	CKY
CKY 434.5 CNRO 491.5 KGW	CYL	370 480	8:15- 9:45 Silent	Silent	Silent	7:15- 8:15 8:00- 9:30	Silent	Silent	Silent 8:00- 9:30	370	CNRO
WEAR 435 AT9 499.7 WMC 434.5 CFCN 508.2 KLX	CYX	330 309.1	Silent 5:45- 6:55	Silent 4:00- 5:00	7:15- 8:30 5:45- 6:55	Silent 5:45- 8:30	Silent 5:45- 6:55	Silent 5:00- 8:30	7:15- 8:45 5:45- 6:55	330 309.1	CYX
KFRII 440.9 KLDS 508.2 WIP	KFAB KFAE	340.8 348.6	Silent Silent	2:00- 3:00 Silent	5:30- 7:30 Silent	Silent Silent	5:30- 7:30 7:30- 9:00	Silent Silent	5:30- 8:00 Silent	340.8 348.6	KOKA KFAB KFAE
WLIT 447.5 WMAQ 516.9 WCX		275 315.6	Silent Silent	Silent 8:00- 7:00	7:00- 9:00 Silent	Silent 6:00- 8:30	Silent Silent	Silent . Silent .	7:00- 0:00 6:00- 8:80	275 315.6	KFAU KFDM
WOAL 447.5 WQJ 526 WHO WHAS 464.3 KFOA 526 WNYC WHT 454.3 WJZ 526 WOAW	KFMQ	467 299.8	6:45-12:00 Silent	4:00-11:00 Silent	6:45-11:00 Silent	6:45-11:00 7:00- 8:00	6:45-11:00 5:30-6:30	6:45-11:00 Silent	6:45-11:00 Silent	467 299.8	KFMQ
PWX 455 KTW 635.4 KYW   KHJ 461.3 WCAE 545.1 KEUO	KFNF KFOA	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 0:00-11:00 8:30-10:00	5:30-7:30 6:00-10:00 6:00-8:30	5:30- 7:30 Silent	5:30- 7:30 6:00-11:00	286 454.3	KFNF KF0A
WJY 467 KFI 646.1 KSD	KFRU KFUO KFVE	394.5 545.1 240	5:30-10:00 Silent 8:00-10:00	3:00- 5:00 6:15- 7:15 Silent	5:00-8:30 6:00-7:00 8:00-10:00	Silent 8:00-10:00	7:15 - 8:15 8:00-10:00	8:30- 9:30 Silent Silent	9:00-11:00 Silent 8:00-10:00	394.5 545.1 240	KFRU KFUO KFVE
SE OF TABLES	KFWA KFWB	261 252	Silent 7:00-11:00	Silent 9:00-11:00	8:00-10:00 6:30-11:00	Stient 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	261 252	KFWA KFWB
e periods given in the "Evening at e" tables are only representative of	KG0 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
station's evening sign-on and sign- ours, and on Sunday, the late after-	KIAF	421	5:30-11:00 Silent	6:00-11:00 2:00-3:00	7:00- 1:30	5:30-11:00 Silent	5:30-11:00 7:00-8:00	5:30-11:00 Silent	5:30-11:00 7:00- 8:00	405.2	KIAF
sign-on and sign-off. If a station an intermittent rather than continu-	K18	384.4 293.9	Silent	7:00- 8:00 7:15- 8:30	7:00-11:00 Silent	Silent 8:00- 9:00 8:00- 7:00	7:00-10:00 Silent	8:00-12:00 8:00-9:00	8:30-11:00 Silent	293.9	KIS
program, the table cannot show this.	KLX	508.2 336.9	Silent Silent 8:00- 2:00	4:80- 8:00 Silent 5:00-11:00	Silent 6:00-11:00 6:30-12:00	Silent 6:30-12:00	Silent 6:00-11:30 7:00-10:00	6:00- 7:00 Silent 6:30-12:00	Silent 6:00-10:30 6:30-12:00		KLDS KLX KNX
"Evening at Home" tables, arranged rder of the wave lengths used (or	KOA	322.4 278	Silent 5:30- 7:00	3:00- 8:00 5:30- 5:30	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		KOA
osed to be used) by the stations. arrangement provides a handy index	KPRC	428.3 269.9	6:35-12:00 5:30- 8:00	6:30-10:00 6:00- 7:00	6:80-11:00 5:30- 8:00	6:30-11:00 5:30- 8:00	6:30-11:00 5:30-8:00	6:30-11:00 5:30- 8:00	7:00-11:00 SHent	269.9	KPO
the other tables, ie "Evening at Home" tables are	KSD	545.1 299.8 305.9	5:00- 7:80 7:00-10:00	Silent 8:00-10:00	7:00-9:00 7:00-10:00 8:00-10:00	8:00-8:00 8:00-10:00 7:00-0:00	5:00- 6:00 7:00-10:00 7:00-11:00	Silent 7:00-10:00	5:00- 6:00 8:00-10:00	545.1 299.8 305.9	KSD
ected overy woek. The number of ges often run as high as thirty per	KTH8	374.8	6:30-12:00 7:25- 8:25	7:50-10:10 7:25-8:00	8:00-10:00 7:25- 8:25	7:25- 8:25	7:00-11:00 7:25- 8:25	6:30 - 7:30 7:25 - 8:25	7:00-12:00	374.8	
of the whole. Keep the "Evening at e" tables from the current issue at	KTW KWWG KYW	455 278 535.4	Silent 6:30 - 7:30 4:00-10:30	7:00- 9:30 Silent 1:00- 2:00	Silent Silent Silent	Silent 6:39-7:30 4:00-8:30	Silent Silent 4:00-10:30	SHent 6:30- 7:30 4:00- 8:30	Silent Silent 4:00-10:30	455 278 535.4	KWWO
side of your receiver, ne material and form of the tables are	PWX	434.5 400	Silent 5:30- 8:00	Silent Silent	4:45- 5:00 Slient	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
rely original with Radio Digest and protected by copyright. Reproduction	WANG WAMD WBAP	315.6 243.8 475.9	9:00-11:00 8:00- 9:00	Silent 12:00- 8:00	4:00-10:00 Silent	Silent 8:00- 9:00 5:30- 8:45	3:30- 8:00 8:00- 9:80	Silent 8:00- 9:30	4:00 - 7:30 8:00 - 9:00	243.8	WARG
whole or part without permission is ed, and such infringements will be	WBAR WBAV	406 293.9	5:00- 6:00 Silent Silent	9:00-10:00 8:00- 9:00 Silent	5:30-10:00 7:00- 8:00 5:00- 7:00	Silent Silent	5:30- 8:45 6:00- 7:00 Silent	5:30 - 8:45 5:30 - 8:30 Stlent	5:30- 8:45 Silent 5:90- 6:90	406	WBAR
ecuted.	WBBM	226 272.6	5:00 - 9:00 4:00 - 5:00	1:00-11:00	Silent	5:00- 9:00 Silent	5:00- 7:00	5:00- 9:00 4:00- 5:00	5:00-7:00		WBBM
r; 7:30-8, program of musical gems, Eastern Out-	WBCN	266 333.1	6:00-10:00 Silent	4:00- 5:30 2:00- 9:00 4:00- 8:45	4:00- 5:00 Silent 3:00- 6:55	6:00-10:00 3:00-6:55	Silent 5:00- 9:00 8:00- 6:53	6:00-11:00 3:00-6:55	Silant 6:00-10:00 3:00- 6:55	266 333.1	WBBR WBCN WBZ
r; 7:30-8, program of musical gems, Eastern Out- na company; 8-9. West Coast theaters by remote rol; 9-11, KNX feature program; 11-12, Abe nan's Coconnut Grove dance orchestra from Am- dedor berd	WCAE	275 461.3	Silent 4:30- 5:80	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
and rotels.  San Francisco, Calif. (428.3), 6:15 p. m., Loow's field theater program; 7-7:20, Palace hotel concerts; 8-11, Palace hotel concert.	WCAU WCAU WCBD	468.5 278 344.6	Silent Silent Silent	1:00- 6:15 1:00- 4:00 6:00- 7:00	4:00- 7:30 Silent	\$11ent 2:30- 8:00	4:00 - 7:30 2:30 - 7:45	Slient 2:30- 7:30	4:00- 7:00 2:30- 7:30	278	WCAU
	WCC0	416.4	4:05- 9:00 8:00- 4:00	5:20- 8:15 3:00- 4:00	4:00- 7:00	Sitent 4:00- 7:00 3:00- 8:00	4:00-10:30	5:00- 7:30 4:00- 7:00	4:00-11:00	344.6 416.4	WCCO
GO BANS SWISH,	WDAF	365.6	4:00-11:00 Stlent	2:00 - 3:30 1:00 - 2:45	3:00- 6:30 4:00- 7:80 Silent	4:00-11:00 4:30- 5:30	3:00 - 6:30 4:00 - 7:15 Stient	3:00- 6:30 4:00-11:00 Sflent	3:00- 6:30 4:00- 7:30 2:00- 8:30	365.6	WCX WDAF WDWF
HISS AND CLICKS	WEAF WEAO 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 WEA0
chers on Radio Classroom In-		389.4 370.2 272.6	4:00-t2:00 4:30- 9:80 Silent	12:30- 7:00 4:00- 6:00 Silent	4:00- 5:00 Silent	4:00- 8:00 4:30- 9:30 4:00- 5:00	4:00- 5:00 4:30- 9:80 3:00- 5:00	4:00- 8:00 4:30- 9:80 Stlent	4:00- 8:00 4:30- 0:30 4:00- 5:00	389.4 370.2 272.6	WEAR
truction Schedule Must Pass	WEEL	475.9 475.9	Silent 6:30-10:00	8:20- 6:20 4:30- 9:00	811ent 4:00- 7:00	4:00-7:00 4:30-10:00	4:00- 7:00 Silent	4:00- 7:00 4:30-10:00	4:00- 7:00	475.9	WEEL
Rigid Examination	WFBH WFI	272.6 394.5	7:30-10:00 2:00- 3:45	1:00- 4:00 12:30- 4:30	4:30- 7:30 7:30-10:00 Silent	7:30-10:00 4:00- 6:00	7:00-10:00	7:30-10:00 3:45- 7:00	4:30-7:30 7:30-10:00 2:45-8:45	475.8 272.6 394.5	WFBH
N FRANCISCO.—When Radio is for classroom instruction, teachers	WGCP WGBS WGES	252 315.6	Silent 2:00- 8:00	3:30- 8:00 5:30- 6:30	3:30- 8:00 Silent	Silent 2:00- 8:00	3:30- 8:00 Silent	Silent 2:00 - 9:00	2:45 - 8:45 3:30 - 8:00 Silent	315.0	Wace
re the microphone must speak with- making funny lip noises, hissing	WGN	250 370.2 319	7:30-11:00 2:30-8:30 4:45-0:15	7:30-11:00 6:00- 7:00 11:00-12:00	Silent	7:30-11:00 3:30- 8:30 4:00- 7:00	7:30-11:00 3:80- 8:30	7:30-11:00 8:30- 8:80 4:00- 7:00	7:30-11:00 3:30- 8:80	370.2	
ds, or taking breath quickly with a	WHY	379.5	5:00- 9:00	3:30- 8:00	4:00- 9:00 3:30- 5:30	4:10- 8:00	4:00 0:00 Stient	3:45- 8:30	3:00- 0:00 4:15- 7:30	379.5	
I such noises were found to be ob- onable in recent examinations of	WHAR		4:00- 5:00 3:30- 6:00 5:30- 7:00	5:00- 8:00	4:00- 8:00 3:30- 5:00 Silent	4:00- 5:00 3:30- 8:00 5:30- 7:30	4:00-10:30 Silent 5:30- 7:00	3:30-6:00 5:30-7:00	4:00-6:30 3:30-8:00 5:30-7:00	275	WHAR
hers for microphone instructors by sators at KGO here, preparing courses	WHAZ	379.5 365.6	Silent	Silent 6:00-11:00	6:00- 8:00 5:00- 6:00	Silent Silent	Stient 5:00- 6:00	Silent 6:00- 8:30	Silent 5:00- 6:00	379.5	WHAZ
classroom instruction for the Oak- public schools, where Radio is now	WHN	361.2 526	3:30- 6:00 Silent	3:30 - 8:00 5:30 - 6:30	8:30 - 8:00 5:30-10:00	3:30- 8:00 5:30- 7:00	3:30 - 7:00 4:30 - 9:30	3:30 - 8:00 5:30 - 10:00	3:30- 8:00 5:30-10:00	361.1 526	WHN
integral part of the system of in-	WIBO	399.4 226 508.2	4:00-10:00 8:00- 5:00 4:00- 8:05	9:00- 7:30 3:00- 9:00 Si)ent	4:00-10:00 Silent	4:00-10:00 3:00-12:00 4:00- 9:00	4:00-10:00 3:00- 9:00		4:00-10:00 3:00-11:00	399.4 226	WIBO
s, during which they spoke into a ditive condenser microphone, while ears listened in for objectionable	WIAS	305.9	Silent 3:00- 8:00	3:20- 6:15 Silent	3:00- 8:00	4:80- 7:00 3:40- 8:00		4:00- 7:00	4:00- 8:00	-	WJAR
ids found bad for school work.	M 1 A	302.8 405.2	3:45-10:00 Silent	5:45- 7:00 4:15- 5:15	3:45-10:00 Sitent	3:45-10:00 4:30- 7:15	3:00 - 8:00 3:45 - 7:00 Silent	3:00- 8:00 Silent 4:30- 6:00	3:00 - 8:00 3:30 - 7:00 4:45 - 5:40	302.	OLL M
the KGO tests it was found that	1011	454.3 340.7	3:00- 7:80 Silent	4:00- 7:00 4:00- 6:00	4:15- 5:15 Silent		5:30- 7:30 4:00- 6:00	4:30- 7:30 Silent	4:15- 6:45 Silent	454.	W JZ
len takings of breath, whistling ids, hissing of sibilants, not notice-		285.5 826 278	9:30-11:00 7:00- 9:00 9:59-10:59	Silent 3:45- 8:00 Silent	Silent 5:00- 7:00	7:00- 9:00 6:00- 7:00	5:00- 6:15 5:00- 7:00	Silent	Silent	285 328	WKRC
in conversation, are picked up by the opbone and are objectionable to chil-	WLIT	394.5 344.6	3:30- 4:30 4:45-10:06	Silent	Silent 3:30- 7:00 Silent	Silent 4:00-10:00	3:30 - 7:00	6:00 - 7:00 Silent 4:00 - 5:55	Silent 3:30- 7:00 4:00- 8:30	394. 344.	WLIT
in the school rooms.	WLW.	422.3	3:00- 5:00	4:30- 5:55 3:30- 5:30	6:00- 7:30	4:00- 7:00	4:00- 8:00	4:00- 9:15	Silent	422	WLW
dio Class Completes Its	WMAK WMAQ WMBB	265.5 447.5 250	Silent 5:00- 7:00 4:00- 7:30	Silent Silent 4:00- 7:30	5:30- 7:15 Silent Silent	Silent 5:00- 7:15 4:00- 7:30	5:00- 6:45 4:00- 7:30	8:00- 9:00 5:00- 7:15 4:00- 7:80	5:00- 7:1:	447.	WMAK WMAQ
Course in Poultry Raising	WMC	384.4	3:30- 9:00 5:30- 7:30	3:30- 9:00 Stient	8:30- 9:00 5:30- 7:30	3:30- 9:00 5:30-10:00	3:30- 9:00	3:30- 9:00	3:00- 9:00	384,	WMBF
PRINGFIELD, Mass.—Certificates will be issued to a large majority of the	WNAC	280.2	2:30- 6:00 4:00- 6:00	3:00- 3:30 11:00- 5:80	2:30 - 8:00 4:00 - 6:00	2:30 - 8:00	0.20 8.00	5:30- 7:30 2:30- 8:00 4:00- 6:00	2:30- 8:00 4:00- 6:00	340.	WMCA
students who recently completed a	WNTE	394.5	2:30- 6:20 6:30- 7:30	5:00- 7:00 6:00- 8:30 7:00- 8:00	3:00- 7:00 6:30- 8:30	3:20- 6:20 6:30- 8:30 7:00- 8:00	3:30- 6:30 6:30- 7:30	7:30- 8:30 7:40- 8:00	3:30 - 6:26 6:30 - 8:30	394.	MOA!
se in poultry flock management which given over Station WBZ by Prof. liam C. Monahan in the role of lec-	WOAW	526 483.6	Silent 4:00-10:00 4:30-10:00	7:00- 8:00 7:00- 8:00 6:00- 9:30	7:00- 8:00 4:00- 9:00 Silent	7:00- 8:00 4:00-11:00 4:30- 6:00	Silent	7:40 - 8:00 4:00 - 8:00 4:30 - 10:00	7:00- 8:00 4:00- 8:00 4:30- 8:00	526	WOAN WOAW
r. These listeners enrolled for the	woo	508.2	3:30- 4:30	12:45- 3:00			3:30- 7:30	3;30-4:30			woo
ege and took it seriously enough to an entrance fee in advance. More	Work	405.2 275 440.9	2:15- 8:00 5:30- 7:30	Silent 3:45- 5:00	8:30- 7:30 2:15- 8:00 5:30- 6:45	5:30-7:00	2:15- 8:00 5:30- 7:60	2:15- 3:30 5:30- 7:00	3:30- 7:30 2:15- 3:30 5:80- 7:30	275	WORD
rses in this Radio college will be red in the future.	WPG WQJ	299.8 447.5	Silent 8:00- 8:00 4:00-12:00	5:30 6:30 5:00- 7:00 4:00- 7:00	6:00- 8:00 8:00- 7:80 Silent	911ent 4:00-7:00 4:00-11:00	6:00- 8:00 Silent 4:00-11:00	Silent 3:00- 8:15 4:00-11:00	6:00- 8:00 3:00- 7:00 4:00-11:00	299.1	WOS WPG
	WRBC	278 468.5	Silent	5:30-6:30	5:30- 6:30 Silent	Silent 4:00- 9:00	Silent	Silent 4:00- 8:00	Silent Silent	278 468.	WRBC
Dismantle Marconi Set ONDON, Eng.—The Famous Marconi	WREO WRW	285.5 273	4:00- 8:30 7:00- 8:00 6:00- 8:80	\$11ent 5:00-8:30	Silent 6:00- 8:30	5:15- 6:45 6:00- 8:30	Silent	5:15- 6:45	Silent 6:00- 8:80	285.	WREO
io station at Clifden, Ireland, is to be	WSAI	325.9 428.3	5:00-10:30 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- 0:00 8:45-10:00			325.	
nantled, and has been sold for that pose. This station has played a lend- part in the development of Radio	WSMB	319 483.6	4:30- 8:30 Silent	Sitent 7:00- 8:00	4:30- 8:30	4:30- 5:30	4:30- 8:30 Silent	4:30- 8:30 Stlent	4:30- 5:30 Silent	319	WSMB
ismission; it was the first Radio sta- to have regular communication with	WTAM	389.4 302.8	3:00- 9:00 5:00- 7:30	Silent 5:00- 9:00	6:00- 7:00 3:00- 9:00 5:00- 7:30	5:00- 7:30	3:00-10:00	Silent 5:00-10:00	Silent 5:00- 7:3	309.	WTAM
erica,	WTIC	348.6 352.7	Silent	Silent 3:20- 7:00	2:55- 4:00	2:55- 5:45 3:00- 8:00	Silent	2:55- 3:00 3:00- 9:30	3:00 - 5:3 3:00 - 7:0	348. 352.	WTIC

# An Evening at Home with the Listener In

	, ,	_	(FOI	R CENT	RAL T	IME)	(Ti	abular f	orm and listings copy production is forbidden.)		(FOR	EASTE	RN TIM	IE Or Ci	ties Usin ght Savi	g Central ng Time	;)	
Call AT8	Silent	Sunday 5:00- 6:00	Monday	Tuesday	Wednesday	Thursday 7:00- 8:55	Friday	Call AT9	Location Fort Bragg, N. C	Met.	Saturday	Sunday 6:00- 7:00	Monday	Tuesday Silent	Wednesday	Thursday	Friday	Call
CFCA CFCN	Silent 11:00 - 1:00 Silent	6:00- 7:00 Silent	Silent	7:15- 8:15 Sflent	7:15- 8:15 Silent	7:15-8:15 9:00-10:00	Silent Silent	CFCA	Calgary, Alta	356.9 434.5	Silent 12:00- 2:00	7:00 8:00 Silent	Silent	8:15- 9:15 Silent	Silent 8:15-9:15 Silent	8:00- 9:55 8:15- 9:15 10:60-11:00	Silent	CFCA
CHNC CJCA CKAC	10:00-12:00 5:30- 0:30	Silent 8:30-9:30 Silent	6:30-7:30 3:30-10:30 Silent	Silent 8:30- 0:00 5:30- 9:30	Silent 7:00- 9:00 Silent	Silent 10:00-12:00 6:30-7:30	Silent 9:30-12:00 Silent	CHNC	Edmonton, Can Montreal, Que	356.9 516.9 410.7	Silent 11:00- 1:00 6:30-10:30	Silent 9:30-10:30 Silent	7:30-8:30 9:30-11:30 Silent	Silent 9:30-10:00 6:30-10:00	Silent 8:00-10:00	Slient 11:00-1:00	Silent 10:80- 1:00	CHNC
CKY	Silent Silent 6:30-11:30	7:00- 9:45 Silent	Silent	8:30-10:45 6:80- 7:30	Silent Silent	8:00- 9:00 Silent	8:30- 9:45 6:30- 7:30	CNRA	Winnipeg, Man	384.4 313	Silent	8:00-10:45 Silent	Silent Silent	9:30-11:45 7:30- 8:30	Silent Silent Silent	7:30- 8:30 9:00-10:00 Silent	Silent 9:30-10:45 7:30- 8:30	CKAC CKY GNRA
CYB CYL	10:30-11:45 Silent	Silent	Silent Silent	Silent 9:15- 10:15 10:00-11:30	6:30-11:30 Silent Silent	Silent Silent Silent	Silent Silent 10:00-i1:30	CYB	Mexico City, Mex	434.5 370 480	7:30-12:30 11:30-12:45	Silent	Silent Silent	Silent 10:15-11:15	7:30-12:30 Silent	Silent Silent	Silent Silent	CNRD
CYX KDKA	Silent 7:45- 8:55	Silent 6:00- 7:00	0:15-10:30 7:45- 8:55	Silent 7:45-10:30	Silent 7:45 - 8:55	Silent 7:00-10:30	9:15-10:45 7:45- 8:55	CYX	Mexico City, Mex	330 309,1	Silent Silent 8:45- 9:55	Silent Silent 7:00-8:00	Silent 10:15-11:30 8:45-0:55	11:00-12:30 Silent 8:45- 9:30	Silent Silent S:45- 9:55	Silent Silent	11:00-12:30 10:15-11:45	CYL
KFAB KFAE KFAU	Silent Silent Silent	4:00- 5:00 Silent Silent	7:30- 9:30 Silent 9:00-11:00	Silent Silent Silent	7:30- 9:30 9:30-11:00 Silent	Silent Silent Silent	7:30- 9:30 Silent	KFAB.	Lincoln, Nebr Pullman, Wash	340.8 348.6	Silent Silent	5:00- 6:00 Silent	8:30-10:30 Silent	Silent .	8:30-10:30 10:30-12:00	8:00-11:30 Silent Silent	8:45- 9:55 8:30-10:30 Silent	KFAB
KFDM (F)	Silent 8:45- 2:00	8:00- 9:00 6:00- 1:00	Silent 8:45- 1:00	8:00-10:30 8:45-1:00	Silent 8:45- 1:00	Silent 8:45- 1:00	9:00-11:00 8:00-10:30 8:45- 1:00	KFDM KFI	Beaumont, Texas Los Angeles, Calif	275 315.6 467	Silent Silent 9:45-3:00	9:00-10:00 7:00-2:00	10:00-12:00 Silent 9:45- 2:00	Silent 9:00-11:30- 9:45- 2:00	Silent Silent 0:45- 2:00	Silent Silent 9:45-2:00	10:00-12:00 9:00-11:30 9:45- 2:00	KFAU KFDM KFI
K F M Q	Silent 7:30- 9:30	SHent 6:30- 9:15	Silent 7:30- 9:30	9:00-10:00 7:30- 9:20	7:30- 8:30 7:30- 9:30	Stlent 7:30- 9:30	Silent 7:30- 9:30	KFMQ KFNF	Fayetteville, Ark	289.8 266	Silent 8:30-10:30	Silent 7:30-10:15	Silent 8:30-10:30	10:00-11:00 · 8:30-10:30	8:30 - 9:30 8:30 - 10:30	Silent 8:30 -10:30	Stlent S:30-10:30	KFMQ
KFOA KFRU KFUD	8:00- 1:00 7:30-12:00 Silent	5:00- 7:00 8:15- 0:15	\$:00-12:00 7:00-10:30 8:00- 9:00	8:00 - 1:00 10:30 - 12:00 Silent	8:00-12:00 8:00-10:30 9:15-10:15	Silent 10:30-11:30 Silent	8:00- 1:00 11:00- 1:00 Silent		Bristow. Okla St. Louis, Mo	454.3 394.5 545.1	9:00- 2:00 8:30- 1:00 Silent	Silent 6:00- 8:00	9:00-1:00 8:00-11:30	0:00- 2:00 11:30-1:00	9:00-2:00	Silent 11:30-12:30	9:00- 2:00 12:00- 2:00	KFOA
KFVE KFWA	10:00-12:00 Silent	Silent Silent	10:00-12:00 10:00-12:00	10:00-12:00 Silent	10:00-12:00 10:00-12:00	Silent	10:00-12:00 10:00-12:00	KFWA	University City, Mo	240 261	11:00- 1:00 Sitent	9:15-10:15 Silent Silent	9:00-10:00 11:00- 1:00 11:00- 1:00	Silent 11:00- 1:00 Silent	10:15-11:15 11:00- 1:00 11:00- 1:00	Silent Silent Silent	Sitent 11:00- 1:00 11:00- 1:00	KFVE KFWA
KFWB KGO KGW	9:00- 1:00 10:00- 3:00 8:00- 2:00	11:00- 1:00 5:30-11:00 9:45-11:00	8:30- 1:00 10:00- 3:00 Silent	0:45- 1:00 10:00- 3:00 10:00- 1:00	9:00- 1:00 Silent 8:00- 1:00	0:00-1:00 10:00-3:00 10:00-2:00	9:00 - 1:00 Silent 8:00 - 2:00	KGO	Hellywood, Calif Oakland, Calif Portland, Ore	252 381.2 491,5	10:00- 2:00 11:00- 4:00 - 0:00- 3:00	12:00 - 2:00 6:30-12:00 10:45-12:00	9:30 - 2:00 11:00 - 4:00	10:45 - 2:00 11:00 - 4:00	10:00- 2:00  Silent	10:00- 2:00 11:00- 4:00	10:00- 2:00 Silent	KFWB KG0
KIAF	7:30- 1:00 Silent	8:00-1:00	0:00-3:30	7:80- 1:00 Silent	7:30-1:00	7:30- 1:00 Silent	7:30-1:00	KIAF	Los Angelas, Calif Sihtipak, Minn	405.2	8:30- 2:00 Silent	9:00 - 2:00	Silent 10:00- 4:30 8:00- 9:00	8:30- 2:00 Silent	9:00- 2:00 8:30- 2:00 8:00- 0:00	11:00- 3:00 S:30- 2:00	9:00- 3:00 8:30- 2:00	KHI
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PWX WAHG WAMD	7:30-10:00 11:00-1:00 10:00-11:00	Silent Silent 2:00-10:00	Silent 6:00-12:00 Silent	Silent Silent 10:00-11:00	7:30-10:00 5:30-10:00 10:00-11:30	Silent Silent	Silent 6:00- 9:30 10:00-11:00		Rithmond, N. V	400 315.6 245.8	8:30-11:00 12:00- 2:00 11:00-12:00	Silent Silent 8:00-11:00	Silent 7:00- 1:00 Silent	Silent Silent 11:00-12:00	8:30-11:00 6:30-11:00 11:00-12:30	Stient	Silent 7:00-10:30	PWX
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WCAC WCAE WCAP	Silent 6:30- 7:30 Silent	Sitent 4:30 - 5:30 3:00 - 8:15	6:40- 8:00 6:30-10:00 6:00- 9:30	Silent 6:00- 9:00 Silent	6:00 - 8:00 6:30-10:00 6:00 - 0:30	Silent 6:00-9:00 Silent	6:00-8:00 6:00-9:00 0:00-9:00	WCAE	Plainfield, Conn	275 461.3	Silent 7:30- 8:30 Silent	Silent 5:30- 6:30 4:00- 9:16	7:00-9:00 7:30-11:00	Silent 7:00-10:00	7:00 - 9:00 7:30-11:00	Silent 7:00-10:00	7:00- 9:00 7:60-10:00	WCAC
WCAU	Silent Silent	3:00- 0:00 1:30- 9:00	Silent 7:00 9:30	4:30-10:00 Silent	4:30- 9:45 Silent	4:30- 9:30 7:00- 9:30	4:30 - 9:30 Stlent		Philadelphia, Pa	468.5 278 344.6	Silent Silent	4:00- 7:00 2:30-10:00	7:00-10:30 Silent 8:00- 10:30	Silent 5:30-11:00 Silent	7:00-10:30 5:30-10:45 Silent	Silent 5:30-10:30 8:00-10:30	7:00-10:00 5:30-10:39 Silent	WCAP WCAU WC8D
WCCO	6:05-11:00 5:00- 6:00	4:10-10:15 5:00- 6:30	6:00-11:00 5:00- 8:30	6:00- 9:00 5:00-10:00	6:00-12:30 5:00- 8:30	6:00-10:00 5:00- 8:30	6:00-11:00 5:00- 8:30	WCCD	MinnSt. P., Minn Betrolt, Mich	416.4 516.9	7:05-12:00 6:00- 7:00	5:10-11:15 6:00- 8:30	7:00-12:00 6:00- 9:30	7:00-10:00 6:00-11:00	7:00- 1:30 5:00- 9:30	7:00-11:00 0:00- 9:00	7:00-12:00 6:00-9:30	WCCO
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WEAD	Silent 6:00- 2:00 6:30-11:30	Silent 2:30-9:00	Silent 6:00 - 7:00	Silent 6:00-10:00	7:00- 8:00 6:00- 7:00	7:00- 8:00 6:00-10:00	Silent 6:00-10:00	WEA0 WEAR	Cleveland, Ohio	293.9 369.4	Silent 7:00- 3:00	Silent 3:30-10:00	Silent 7:00-8:00	Silent 7:00-11:00	8:00- 9:00 7:00- 8:00	8:00-9:00 7:00-11:00	Silent 7:00-11:00	WEA0 WEAR
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WGR	6:45- 8:15 8:00-11:00 6:00- 7:00	5:30-10:00 3:15- 4:15	6:00-11:00 5:30- 7:30 6:00-10:00	6:10-10:00 6:10-7:00	6:00-11:00 Silent 6:00-12:30	6:00- 9:00 5:45-10:30 6:00- 7:00	5:00-11:00 6:15- 9:30 6:00- 9:30	WRY	Schenectady, N. Y	319 379.5 275	7:45- 9:15 9:00-12:00 7:00- 8:00	2:00 - 3:00 6:30-11:00 4:15 - 5:15	7:00-12:00 6:30- 6:30	7:00-10:00 7:10-11:00	7:00-12:00 Silent	7:00-10:00 0:45-11:30	6:00-12:00 7:15-10:30	WGR
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WLBL WLIT WLS	11:59-12:59 5:30-6:30 6:45-12:00	Silent Silent 6:30- 7:55	Silent 5:30 9:00 Silent	8:00- 0:00 Silent 6:00-12:00	5:30-9:00	8:00- 9:00 Silent 6:00- 7:55	Silent 5:30- 9:00 6:00-10:30 Silent	WLBL	Stevens Point, Wis Philadelphia, Pa Chicago, Ill	278 394.5 344.6	12:59- 1:59 6:80- 7:30 7:45- 1:00	Silent	Silent 6:30-10:00	9:00-10:00 Silent	Silent - 6:30-10:00	9:00-10:00 Silent 7:00- 8:55	Silent 6:30-10:00	WLBL
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# Radio Digest

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Vol. XIV

Saturday, August 1, 1925

### 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.

Oue 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 should be sent. Probably enough 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 notel broadcasting station are treated. Does someone lead them about on a tour of inspection and tell them all about the workings of the plant, where the artists stand, the announcer at his microphone, 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.

Weckly 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 both 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



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

He says "or-KESS-tra" 6,000
He says "or-KESS-tra" 5,000
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 coroer 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)

Scenet Studio of KNX.
Time: 6:45 p. m.
Oharacters: Town Crier, announcer of KNX and Paul
Pinstein, 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 music on this hour."
Finstein: "All right. We'll play Andantino in D. flat." (Sciection is then played.)
Town Crier: "You said you were going to play Andantino in D. flat and you were going to play Andantino in D. flat and you were Moonlight and Roses. How come?"
Finstein: "We did play the Andantino. Don't you know the Andantine 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

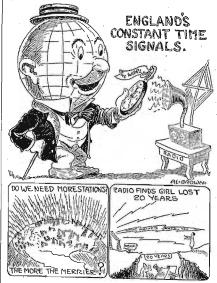
By Delmer Buglass

Billog only the paid critic of NWG, I can scarcely refrain from patting our station on the back. It is wonderful. Always 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 sup- Delmer Criticises pose I found? No-sir-ee, ugh, ugh.
I heard the jungles of Tennessee on the air, and a lot of monkeys were discourising on their improbable (they hoped) relationship with man. And the big black monkey were discourising on their improbable (they hoped) relationship with man. And the big black monkey work at's his name?" No, what's his name?" and the big black monkey said to the flerce ape, "Mo?" So, good might, kiddies! Come around tomorrow so good might, kiddies! Come around tomorrow NWG. And maybe I'll take a nasty crack at WTAS 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 instrumentation 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

PoR the past year the research council of Canada, on behalf of the department of marine and fisheries, has been conducting an investigation into the causes of and means of locating and sup-

ment or marine and fisheries, has been conducting an investigation into the causes of and means of locating and suppressing Radio inductive interference, and the Radio branch of the department is now in a position to put into practical use some of the results of this investigation, and solicits the cooperation of all those interested in Radio in the work of clearing up such interference and continuing the study.

All electrical conductors carrying current are surrounded by an electromagnetic field. When the current in a conductor changes, the electromagnetic field also changes in a similar way and will induce a voltage in any Radio receiving merial close to it.

There is also another field, called the electrostatio field, surrounding all electric conductors at high voltage. A change in this electrostatic field also induces a voltage in the aerial of any Radio receiver which is close to the power wires.

Under normal operating conditions on electric power lines, this electromagnetic and electrostatic field which surrounds the conductors does not extend more than a few yards from the power line. In some cases, however, where the change of current of the change of voltage is of a very sudden nature, called an electrical surge, a receiving aerial situated at a considerable distance from the power line may be affected. An electrical surge may travel many miles along a power line, and produce a radiation which may be picked up on Radio receivers.

The Radio receiver aerial system, which includes but the aerial and recond with

on Radio receivers.

The Radio receivers aerial system, which includes both the cerial and ground wire, should therefore be placed at as great a distance as possible from all electric light poles in vicinity of the interference which will make and break a faulty ironit, and this is obsciked by another operator at the super-heterodyne on the bench. In me case should an aerial be erected above a power wire in such a way that it would be possible for the aerial of the contact with the power wire in such a contact with the power wire in contact with the power wire in contact with the power wire in such as a provide useful clues in the nearly as possible in a direction at right. The following characteristics of the nearly as possible in a direction at right contact with the power wire in such a way that in contact with the power wire in such as way that in contact with the power wire in such as way that in contact with the power wire in such as way that in contact with the power wire in such as way that in contact with the power wire in such as way that in contact with the power wire in such as way that in contact with the power wire in such as way that in contact with the power wire in such as way that in contact with the power wire in such as way that in contact with the power wire in such as way that in contact with the power wire in such as way that it would be possible for the aerial to come the such as a cidentally coming in contact with power wires.

Radio inductive interference which will make and break a faulty of the interference which will make and break a faulty will make and break a faulty as which it sould be received about a cidentally coming in contact with power wires.

Battery chargers of the vibrator type cause an electrical surge which may cidents have been caused in the past of the super-heterodyne on the bench.



The department's inductive interference car. The sledge hammer is used to strike electric light poles in vicinity of the interference which will make and break a faulty circuit, and this is checked by another operator at the super-heterodyne on the bench.

travel along the supply wires of the sec-ondary distribution system and cause Ra-dio interference to all receivers near these

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 300 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.

Faulty disulator on a transmission line of 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 may be induced on to other lines which run parallel to it and thus be distributed over a wide area, possibly throughout the entire city. This 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 or 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 sbut down, as the amount of cur-

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# A. B. C. Course in Radio Fundamentals

## Chapter XIX - Operation of the Electron Tube

By David Penn Moreton

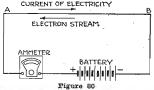
THE electron or vacuum tube, to most Radio set owners, is nothing more than a small glass bulb, very much like a suall electrical connections in the real and into the surrounding space. When an electrical pressure is applied to a conductor, the direction of motion into a directed motion or drift, and having four electrical connections instead of two as in the ordinary lamp. This simple device, however, constitutes the very heart of practically all modern Radio receiving sets and its development. We ordinarily think of a current of electrons because the very heart of practically all modern turing the past twenty years represents one of the most important advances in the realm of electrical science. In addition to its importance and another the positive to the negative to the megative to the residue to the side circuit. The electron stream is in the opposite direction or from B to A, that is from the positive to the negative to the negative to the megative to the megative to the megative to the megative to the positive to the negative to the side circuit. The electrons of the B battery be reversed, and the plate and some are free. The free electrons gream is in the opposite direction or from B to A, that is from the positive to the positive terminal of the battery through the outside circuit. The electron stream is in the opposite direction or from B to A, that is from the positive to the positive the terminal of the battery through the outside circuit, all the plate circuit, all in which this current flows is commonly that the electrons gream is in the opposite direction or from B to A. The circuit is called the B battery. The explanation for this is as follows:

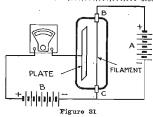
The electronal stream is in the opposite direction or from B to A, that is from the positive to the negative to the positive terminal of the battery through the outside circuit. The electron stream is in the opposite direction or from B to A, that is from the positive to the positive through the outside circuit. The electron stream at one of the B batte

velopment.

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 subtances consist of negative and positive electricity. Each atom is supposed to consist of neucleus of positive electricity around which the negative charges or electrons are grouped, and the electrical effect of the positive electricity just neutralizes the electrical effect of the positive electricity instructuralizes the electrical effect of the clectrons, 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 ntoms 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





trons per second. When the molecular structure of a material is such that it prevents the passage of electrons more or less completely the material is called an insulator, and if the electrons can move through the material without meeting much opposition, the material is called a conductor.

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.

Guided Electrons Are Current

A current of electricity, according to the electron theory, is a stream of electrons guided by a conductor. The stream of electrons is in the opposite direction to that in which the current of electricity of the electrons in the opposite direction to that in which the current of electricity of the electrons TREAM

BATTERY

BATT

nected in this circuit is called the B battery.

If the connections of the B battery be reversed, and the pinte 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.

Radio reception.

The Edison Effect

In the early days of the carbon filament incandescent lamp, Edison noted a phenomenon wheh could not be explained a phenomenon wheh could not be explained that time. A metal plate was scaled 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 galvanometer, 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-

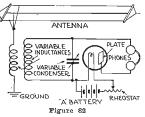


Figure 82
Thur both of the parts of the disrupted atom become carriers of electricity and contribute to the flow of current through the gas. This action of a colliding electron upon an atom is called "ionization by collision," and on account of it, relatively large plate currents are obtained in electron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



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

### THE SHAMROCK-HARKNESS Two-Tube Reflex

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

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SHAMROCK MFG. CO., Dept. 36C, Market St., Newark, N. J. Thease send me a copy of "Shammor Builders Guide Bask" condaining and complete instructions for building and represent origins from \$15 to \$50. 10 cents (U. S. stampa or coln).



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

بالمراجعة والمحاجز والمراجع والمناجع والمحاجز وا



## 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 outfar to use of some 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 is very sensitive but controlled by two dials plus only one rheostat. Potentiometers, 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 heterodyne 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. A fixed rectifier detector is then used to convert the intermediate frequency. A fixed rectifier detector is then used to convert the intermediate frequency. A fixed rectifier detector is then used to convert the intermediate frequency. A fixed rectifier detector is then used to convert the intermediate frequency and decaded to the first tube, from which the amplified audio output is obtained.

The four tubes thus afforded—one ori-ginal Radio frequency amplifier, an oscil-lator and amplifier, two stages of inter-

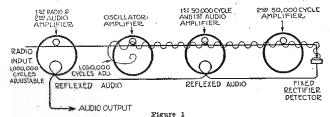
1 8 فلأفلف 00000 000000 ① }® aggggg M INPUT **(4)** 

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.

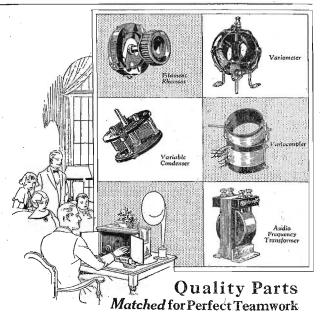
The intermediate frequency output from the third tube goes through a similar intermediate frequency transformer 14 of small dimensions and repeats into the fourth. Mica by-pass condensers are used in the grid circuits of the first and third tubes. Condenser 3 is .003 mfd. and condenser 2 is .002 mfd. A 4-volt C battery is used in the grid circuit of the third 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 has a fixed condenser from the grid circuit of the third tube is good at the intermediate heterodyned frequency, but is put through a transformer 15 has a fixed condenser and to the third tube. The ransformer 15 has a fixed condenser and to transformer 23 is shunted around the by-pass condenser 21 in the grid circuit of the third tube. The ransformer 23 is shunted around the by-pass condenser 18 of .003 mfd. capacity. Transformer 23 is shunted around the by-pass condenser 18 of .003 mfd. capacity. Transformer 23 is shunted around the by-pass condenser 18 of .003 mfd. capacity. Transformer 23 is shunted around the by-pass condenser than a ratio of one to the third tube is fed into the transformer 23 is shunted around the by-pass condenser 18 of .003 mfd. capacity. Transformer 23 is shunted around the by-pass condenser 21 condenser 24 condenser 25 condenser 26 condenser 26 condenser 26 condenser 27 condenser 27 condenser 28 condenser 28 condenser 29 condenser



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 aorial input will be required for good results.

The four tube heteroflex est 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 eontinuing until a total of 100 feet of number 18 copper wire is so wound. The tuning condenser converted between the first netwer is so wound. The tuning condenser 11 are 1,005 mid. variable plate types and must have a vernier dial, because the tuning is very sharp and will be lost by rapid manipulation of condenser knob controls.

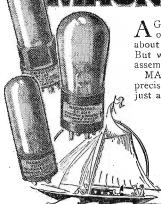


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the tremendous amplification.

Not a Complicated Cirouit

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 audiowith the heteroflex but this will not be found necessary. If the heteroflex is well built. It is not policy 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 disphragm.

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 condenser will operate below or above each setting so slow turning of the condensers is

known stations. The oscillator condensor will operate below or above each setting, so slow turning of the condensors is recommended. A station found can be repeated at will with the same setting. To check up, if the Radio stages are operating O. K., a headset in series with a fixed rectifier can be connected successively across the secondaries of each Radio transformer while the set is operating on some broadcast 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 by some by-pass wiring or short circuit.

circuit.

Panel size can be to sult, 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 condensors of the input and oscillator circuits, so that one control handles both circuits in correct ratio. The two disis 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 sociated superheterodyne circuits using six to ten tubes as worked out by others. As compared to other reflex sets, the heteroflex accompand to the reflex sets, the heteroflex nutilizes more efficient 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

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 mind from the interference picked up by an aerial. A practical point to keep in mind regarding sensitive sets such as the heteroffex 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 essential, as it receives interforences only from the same general directions that the signils are coming from; not from all directions, as in the case of an aerial. (Some jurgiling of fixed capacities and grid bias will be found desirable. Filter may be at input or output of the intermediate stages and individual rhoostats are a help. The technical staff successfully built one of these sets, so the reader can proceed with the knowledge that Hotorofex 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 16 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, thray and fourth if suitable provisions are made the first tubes are now made to have only the pure electron flow. The first of the difficulties is the rapid deterioration of the circuit 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 flament current. The by-pass condenser 19 is a mice one having 1 mid. 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.

Not a Complicated Circuit

The heteroficx 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 its possible to use a thrd stage of audio with the heteroficx is but there are two outstanding down the control is had by the state of the different. Tubes having a high vacuum can, on the other hand, be constructed windings, or by-pass condensors. It is possible to use a thrd stage of audio with the heteroficx is will not be found necessary if the heteroficx is will not be found necessary if the heteroficx is will not be found necessary if the heteroficx is will not be found necessary if the heteroficx is will not be found necessary if the heteroficx is will not be found necessary if the heteroficx is will not be found necessary if the heteroficx is will not be found necessary if the heteroficx is will not be found necessary if the heteroficx is will not be found necessary if the heteroficx is will not be found necessary if

### 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 internittent during windy

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.

Faults on Transformers

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 read.

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 power 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 coming in on the air.

Preliminary 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.

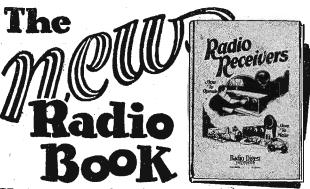
Second Test: To determine whether the interference originates in your own houselighting out the provability is that the source of the noise

these are of a purely local nature, originating in such sources as a lamp loose in its socket, or a loose plug of a heater, or from faulty household apparatus. While the interference is continuous, open your main house-lighting switch for a fow seconds at the same time listening in on 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 ≈ understand radio. assemble circuits, improve reception, operate sets.

VERY phase of Radio reception gathered into one book at 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 assembliesall 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.

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MIN'

# 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-

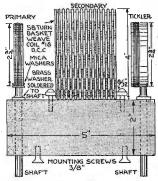
HERE are many little kinks worked out at home that would aid your fellow Radio worker if only he knew about them. There are new hook-ups, new ways of making parts and various unique ways of operating sets that are discovered every day. Radio Digest is very much interested in obtaining such material.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

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

2" x 5" x 1". In this, %" from each end, you drill two %" holes for the shafts and %" from these you drill two holes using a number 20 drill; then tap these with an 8/82 tap. On the opposite edge you drill two more holes using a number 29 drill; one is %" from shaft hole and the other is 1%" from the other shaft hole.

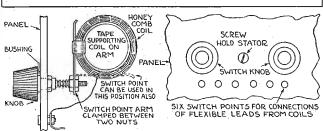
Next make the shafts These are two

Next make the shafts. These are two pieces of %" bruss or rubber rod. Rubber is best, 31/2" in length. Drill and tap one



end of these for an \$/32" serew. Then, if brass was used, solder a brass washer \$\frac{7}{3}\$ 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 24" 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 4" length of bakelite tube 24" in diameter. Wind, on one side of this, 15 turns of number 26 dec. wire and then drill a hole that will pass an \$/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 dosired, and which require only three switch point dials, which any fan always has lying around and does not require any extrastormount.

These dials can be spaced according to the kind of coils. Any type may be used, where a variable coupling is dosired, and with a little care a very neat and desired and mounting can be made. The center knob is removed using only the screw given to make the two variable dials.—W. A. Moyer, Springfield, Ill.

wire and fasten to one shaft with a ma-

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 slip on shafts that project through planel and put on dials. In making connections to this unit use pigtail wire with spashetti or rubher covering.—Forrest Bryant, Minneapolis, Minn.

### 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.

a number of variations in the nature of 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

suitable. Great accuracy is required in these tests for it has been found that many misleading reports have been received from observers who were not sufficiently accurate in their observations. For instance, interference has been reported to be associated with the switching on of the street lights in cases where the interference actually was produced by another circuit which was switched on every evening about duck. If the observers 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 radilles from, by means of a

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 may, however, be used in connection with the loop which will be suitable for determining the conductors from which the interference 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 roceiver 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.—Editor's note).

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## The "Goode" Two-o-One





QUARTER AMPERE

### RADIO TUBE

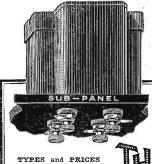
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ordarson "Super" Audio equency Transformers are to had in three ratios: 2-1, : 344-1, \$4; 64, \$4, 50, ordarson Power Amalifying ansformers are \$13 the pair, ordarson Inferstage Power Transformer, \$8.

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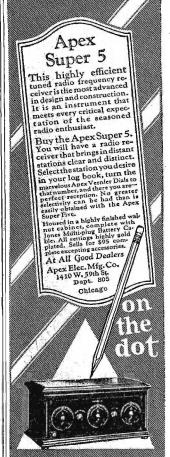
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# **Questions and Answers**

Transmitting Informati

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? Average cost of 50-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 inst what praceedings. 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.

The only concerns who can legally sell.

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 legape of Hartford, Conn. That magazine and that organization are devoted exclusively to amateur transmission both in code and in voice.

To Tune Above 360 Meters

To Tune Above 360 Meters

(13376) NS, Hutchinson, Kan.

A neighbor has a new five-tube set which refuses to "pere" 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 ou the lower wave lengths. For some reason nothing will come through, not even static. This so thas two pieces 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 howl on any setting. The aerial is about 115 feet long and ground O. IK. 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 outits is to secure maximum amplification with a little regeneration at all wave lengths.

plification 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.

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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 your described by the same dead turns can be cut out when a switch by means of which have to be a switch by means of which these added turns can be cut out when someone has changed the setting of this reception is desired on the lower wave leak which would render the set imperiengths as the presence of these extra ative. Since there are no howls expense turns will cause howling if they are not climinated when tuning below 360 meters. Connection. We would suggest that you this and it is on their settings that the regeneration is determined. We are not aware of the faut that the — company was licensed to use this device by Prof. Hazeltine and we are inclimed to believe that they are infringing on some patents.

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 ne 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. sot and not a neutrodyno and it seems to us that you must be mistaken on this point. If you have tested all of the accessories and find that your batteries 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

PATENT ATTORNEYS

PATENTS. Booklet free. Highest references. Best results. WATSON E. COLEMAN, Patent Lawyer, 644 G Street, Washington, D. C.

ATTENTION please. Is it worth 250 and an hour's work to you to improve you tuning? If so 25c will bring you complete data of a device that you should not be without St. Paul Radio Improvement Co. P. O. Box 3138-H, St. Paul, Minn.

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bee COLLINE'S NEW RADIO MAP
With its help you and final instantly
how far away any station is. If you use a
directional aerial, you can point the loop
exactly toward the station you want to
get. The map also outlines the radio
districts, and gives an alphabetical list
of all stations and their operators.
Thousands have already been sold. Get
reader's, and gives on the property of the colories, and gives are alphabetical use
to fall stations and their operators.
Thousands have already been sold. Get
reader's, COLLINE SON COMPANY
See Park Avenue
New York City



Underground Antenna Cable
(1399) 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 Paranito cabla 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-

for drilling all strades of Bakelite and all metals. Some or Reddo outlet complete without one of our metals of the strade of th

and this cable sells for \$1.50 per hundred feet.

As to a book in which you can pasto station stamps we wish to advise that the originators of this idea are the Ekko Company, 111 W. Monroe Street, Chicago. Their album sells for \$1.75.

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 cracking 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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510 N. Dearborn Street
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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 continuappears in five parts, serially icontinuously 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 4.s you can find—if 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 second part of the schedule list appears below. The first appeared last week.)

KJS. Los Angeles, Calif. 293.9 meters. 759 watts. Rivic Inst. of Jos Angeles. Announce., M. E. Carrier-Siogan, "King Jesus Saves." Mor. 8-9:30 pm, Tuest. Week. Thurs. 8-9; and 3-93.0 charges. The control of the contr

Total Processes of the Sammerses 50 wests. Sam Josanim L. Per, Corp. Stepan, "Home of the Raisina" Irregular schedule. 250 meters. 100 watts. Asia. Joseph L. Per, Corp. Stepan, "Home of the Raisina" Irregular schedule. 250 meters. 100 watts. Asia. Process. 100 watts. General Elice Co. Dully ex Sun. 1220 pm. cranic. 1 weather, markets. Mon. 6 pm. stocks. 25. chacett. Total. 3 watts. 100 watts. General Elice. Co. Dully ex Sun. 1220 pm. cranic. 1 weather, markets. Mon. 6 pm. stocks. 26.25. bedtime heav. 3, 10-12. Thurs. 8 pm. matinaci. 0, dinner master. 300 watts. 6 miles. 100 watts. 100 pm. stocks. 102. pm. cranic. 2 miles. 100 pm. stocks. 102. bedtime heav. 3, 10-12. Thurs. 8 pm. matinaci. 0, dinner master. 200 watts. 0 fm. fm. collect. 8 miles. 8 mil. 11 nm. service. 2 miles. 100 pm. stocks. 102. pm. miles. 100 pm. stocks. 102. pm

COTTECTED EUROPY Week—Part III

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rerral Broadcossum.
7:20, 10:30, Thurs, 6:20 pm, 7:30-8. Zassum.
Right.
Rock, Burlington, VI. 252 meters. 100 watts. University of Vermont. Strain, "The Voice of the Green
10 for rest of unmore. Eastern face August
WGAY, Milwaukee, Wis. 266 meters. 250 watts. MilWaukee Civic Broadcasting Station. Closed indenficial.

Lines, and the Chronicle. Announcer, Clair N. Mortiers of the Golde Gale. The Golden Announcer, "The City of the Golden Gale." The Golden Gale. The Golden Gale." The Golden Gale. The Golden Gal

E. Eröstein. Mon. 10:30-12 midnight. Tues. Wed, St. 7-8 pps. 10:30-12 Central.

Well, Salt 8-8 pps. 10:30-12 Central.

Well, Salt 8-8 pps. 10:30-12 Central.

Land 10:30-12 Central.

Well, Salt 8-8 pps. 10:30-12 Central.

Well, Salt 8-8 pps. 10:30-12 Central.

Well, Well, Salt 8-9 pps. 10:30-12 Central.

Salt 8-9 pps. 10:30-12 Central.

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(The third part of the directory of station schedules will appear next week.)

