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RADIO  
MAGAZINE

# The Daily News

EVERY  
MONDAY

SAN FRANCISCO, MONDAY, June 30, 1924

## GIRL TO SAIL AS OPERATOR

### FINAL PLANS FOR BIG P. R. SHOW MADE

With virtually all exhibit space sold, plans for the Pacific Radio Exposition to be held in the Civic Auditorium Aug. 16 to 21, inclusive, are rapidly nearing completion, according to A. S. Lindstrom, chairman of the executive committee of the Pacific Radio Trade Ass'n, in charge of the show.

Contracts have been signed for all of the 160 booths into which the main floor of the auditorium will be divided. Every national manufacturer of receiving sets has reserved space, he said, and there will be scores of exhibits by individual dealers, he said.

Elaborate plans for decorating the auditorium as well as for numerous entertainment features for the public, are now under consideration by the executive committee. It is estimated that more than 100,000 persons will visit the show.

Assisting Lindstrom on the executive committee are: P. L. Jensen, H. W. Dickow, F. J. Cramm and C. C. Langevin.

### PHONE LINKED WITH RADIO 'BACK-FIRING'

CLEVELAND, O., June 30.—When will wonders in radio cease? radio fans might ask.

A unique demonstration was given by WTAM, radio station of the Willard Storage Battery Co., recently.

A late dance concert of request numbers was being put on the air when a fan called the studio by long distance telephone from Ft. Thomas, Ontario, placed his loud speaker to the telephone and sent back over the wires the same music that was being sent out by wireless 15 feet away.

The speed of the round trip of the signals was so great that the music came back from Canada at the same instant that it was going into the microphone in the next room.

To complete the circuit of sound, telephone wires carried the signals from the studio to the transmitting set, seven miles away. From there the ether

### SHE'S FIRST GIRL "SPARKS"



Miss Constance Lee Sharp, 17 years old, who has the honor of being the first woman commercial radio operator on the Pacific Coast.

### NOW ALL BEST TRAINS CARRY RADIO OUTFITS

Experiments in radio reception aboard moving trains are relegated to the past, and entertainment of passengers on cross continental trains by radio has become a fact following the installation of receiving sets on coast to coast trains of the Canadian National railways.

WTAM, the Willard Storage Battery Co.'s broadcasting station, was successfully received on board the Canadian National transcontinental train No. 1, en route from Montreal to Vancouver.

According to Frederick P. Kent, radio operator on this train, WTAM entertained passengers all the way from Montreal to North Bay, Canada, at which point the station signed off. Other stations are picked up regularly as the trains come within their range, so that scenery by day and music by night helps to enliven the trip for the traveler.

carried them to St. Thomas, about 100 miles away, straight across Lake Erie. From St. Thomas they were put on the wire again, going about 400 miles around the lake to get back to the studio.

### Middies Must Qualify

Midshipmen of the U. S. Naval Academy at Annapolis have to take up radio and pass a thorough examination before graduation. One of the requirements is to build a workable receiver.

### "Worriors" From Wor

Station WOR, Newark, N. J., has started a team of "Worriors" on the radio-path. It's the term given a group of artists who will broadcast musical and vocal selections from that station hereafter.

### Post On Ship Given Fair Radio Expert

#### Radio in Divorce

Mrs. Cora May White of Minneapolis has agreed to withdraw her suit for divorce when her husband consented to be limited to a one-tube set and no profanity. White had claimed he took to radio to be relieved of the nagging he got from his wife.

### RADIO BEACON IS SOLUTION OF S. F. BAY PERILS

Safer passage across San Francisco bay in foggy weather could be effected through the use of the cross-coil radio beacon, developed at the Bureau of Standards in Washington, bureau engineers believe.

This beacon marks out a line in the ether, and a boat equipped with an ordinary receiving set can be directed safely to its destination by keeping in touch with that "line."

The beacon consists of two coil antennae crossing at 135 degrees. Its strongest signal is heard on a line bisecting this angle, so that a boat off this line would hear a signal from one coil stronger than that from the other, and would know it is off the directional line.

#### Carries All Kinds

The U. S. S. Shenandoah, Uncle Sam's great dirigible, is carrying such a complete radio outfit that it will be able to communicate with all kinds of stations at all wavelengths. This includes even the broadcast band of wavelengths.

#### RADIO WITHOUT WAVES

Waveless radio is seen as a possibility through tests conducted by Station WRM at the University of Illinois. With the new devices only the modulated sound frequencies are broadcast.

Woman has invaded another realm hitherto considered the sole monopoly of mere man.

She has donned the ear phones and tuned in for a career on the briny deep.

Consider the case of dainty Miss Constance Lee Sharp, of Los Angeles. She has stepped up to the radio inspector's office, undergone the dot-dash and technical test and emerged the proud possessor of a regular, first-class radio operator's license.

Now she's going to climb the gang plank of the steamer Avalon and stand watch exactly the same as her brother operators on ships on all the seven seas.

Miss Sharp has been a fan for several years. When wireless was an amazing thing, with long flashing sparks sputtering between electrodes and big motor generators roaring, she used to gaze in wonderment, and wish that she could operate one of the terrifying machines.

Now she has a set all her own, the mystery of what brings the sound into her ear isn't a mystery any more, and she is as much at home among coils, and condensers and switches and oscillating tubes as she is among the curlers and hair transformers of a beauty shop where she has her bobbed locks touched up now and then.

Miss Sharp obtained her commercial license as a full-fledged operator July 10, 1923. The Avalon, where she will act as guardian of the sputtering ether waves, operates between Catalina Island and Los Angeles.

Now mariners are asking themselves a difficult question. Will the radio operator still be the last one to leave the ship mayhap to go down with the vessel, in case of disaster?

### Monopoly Is Sought

They're trying it in Paraguay—a monopoly of radio sales for the next five years. Broadcasting is promised if the right is granted.

## RADIO ROBS STORMS OF PERILS IN U. S.

NEA Service

DETROIT, Mich., June 30.—A national communication system by which broadcasting stations may be used to transplant the telegraph and telephone during emergencies has been devised by S. W. Edwards of this city.

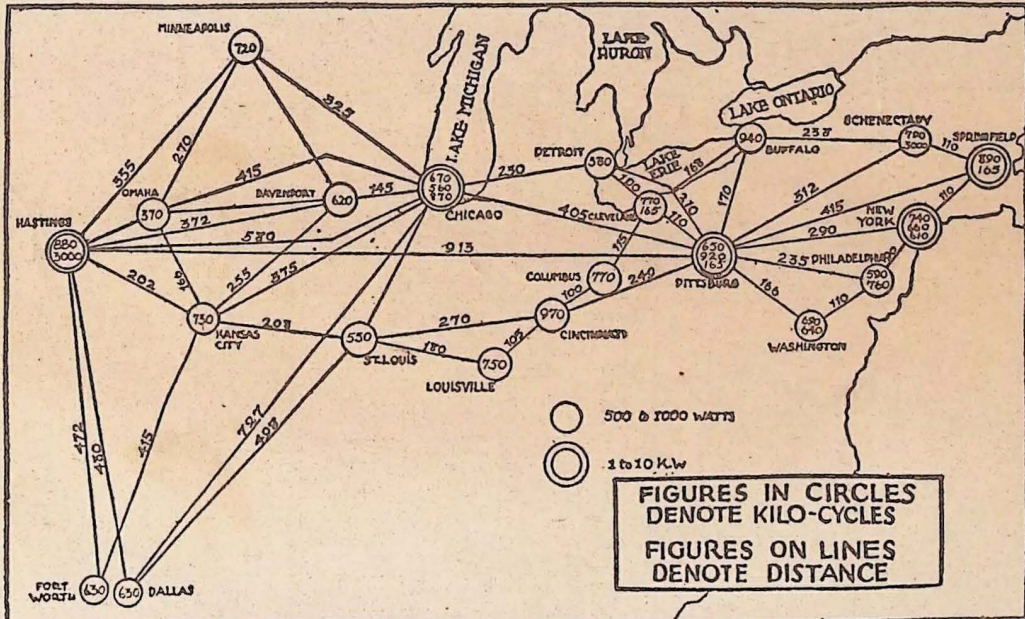
Edwards is radio supervisor for the Eighth District, of which Detroit is headquarters. He has submitted his scheme to the Department of Commerce, whose officials it is expected will study it and perhaps adopt it as a general emergency communication plan.

The idea originated, Edwards explains, after storms in various parts of the country had practically shut off whole sections from the rest of the country by tearing down wires and crippling all other forms of communication.

#### Substitute Service

According to Edwards, in such emergencies, broadcasting stations could well replace the wires and so maintain transmission of information from stricken areas.

"This emergency service," explains Edwards in his report, "should be prepared to handle on short notice messages relating to trains, press reports, ur-



This criss-cross of lines and circles is a plan of the emergency communication system for broadcasting stations, outlined by S. W. Edwards of Detroit. Direct and alternate routes are suggested, and similar routes may be extended among stations of the entire country.

gent commercial and government messages, flood and storm warnings, and requests for assistance in case of uncontrollable fires." Edwards' scheme would assign

to each broadcasting station of the B class another of the same class with which it is to maintain emergency communication at a definite wavelength. His tentative plans embrace only the first, second, third, eighth and ninth radio districts, mostly in the northeast and middle west. But he says this can be extended to cover the entire country.

#### Details of Plan

The larger, or Class B, stations could maintain a trunk line emergency system over the country, and turn over their traffic to the smaller Class A stations or to amateurs for local distribution. By the use of telegraph, instead of telephone, Edwards believes a greater number of stations, including especially amateurs, could work together toward transmission of the emergency service at all times of day and night.

The plan of assigning definite stations for intercommunication, Edwards points out, is designed to avoid confusion if more stations tried to transmit at the same time.

"A chaotic condition would result if stations were to try and communicate with other stations promiscuously," he says.



# THIS WEEK'S AIR PROGRAMS

Monday, June 30

**KPO—Hale Bros., San Francisco (423 Meters)**

1 TO 2 P M—Rudy Selger's Fairmont Hotel Orchestra.

2:30 TO 3:30 P M—Piano duets, La Paloma; Fantasie de Concert; Janet and Val Ritschy (pupils of Lorrain Eulog).

Group of old folk songs. The Possession Song (Das Dreigespann, Russian, 1844); The Widow and His Child (Der Tyroler und sein Kind); Tyrolean folk song; When the Swallows Homeward Fly (in German); Josefina Cramis (linguist, lecturer and traveler). Ruth Oskey, accompanist.

Quartet selection, Kentucky Babe; Fishing; The Bullfrog; Californian Quartet. Russel Lyman, first tenor; Albert Deasy, second tenor; Clayton Horn, baritone; Fred Ellenberger, bass.

Piano solo, Waltz in G Flat Major; Impromptu; Val Ritschy.

Group of international popular songs, Bonnie Sweet Bessie; Chanson de Florian; Home Sweet Home; Josefina Cramis; Ruth Oskey, accompanist.

Quartet selections, Don't You Cry, My Honey; That Old Gang; On the Levee; Californian Quartet.

4:30 TO 5:30 P M—Rudy Selger's Fairmont Hotel Orchestra.

5:30 TO 6:30 P M—Children's Hour: Daniel Boone; Boring Through the Alps; The Wonderful Friends.

7 TO 7:30 P M—Rudy Selger's Fairmont Hotel Orchestra.

8 TO 9 P M—Organ recital by Theodore J. Irwin, official organist, at the Wuriltzer.

Overture from Oratorio "Samson"; Andantino, D Flat (by request); Lamentation, oriental chant; musical comedy selection, "Little Miss Bluebeard"; song melody, Silver Threads Among the Gold (by request); symphonic poem, Finlandia; song melody, Lonesome and Blue; Gavotte; fox trot, selected.

9 TO 10 P M—Violin solos, Old Maid's Song; Air; From the Land of the Sky Blue Water; Antonio Blaha; Isabelle Silva, accompanist.

Soprano solos, An Open Secret; O Lovely Night; Lenore Sollerder Campbell; Claire Anita Coltrin, accompanist.

Baritone solos, Infelice, from opera "Armani"; On the Road to Mandalay; Antonio Ruiz; Mme. Esabel Lenhard, accompanist.

Violin solos, Cradle Song; Minuet; Antonio Blaha; Isabelle Silva, accompanist.

Contralto solos, Rose of My Heart; My Heart at Thy Sweet Voice; Belle Jacobs-Lewis; Theodore J. Irwin, accompanist.

Piano solos, Pasquinade; Starry Night; Mme. Esabel Lenhard.

Baritone solo, La Paloma; Antonio Ruiz; Mme. Esabel Lenhard, accompanist.

Violin solos, Love Scene; Fantasie Garden Scene; Legende; Antonio Blaha; Isabelle Silva, accompanist.

Contralto solos, O Haunting Memory; Rachein (Merch); Belle Jacobs-Lewis; Theodore J. Irwin, accompanist.

10 TO 11 P M—E. Max Bradfield's Versatile Band.

**KGO—General Electric Co., Oakland (312 Meters)**

1:30 P M—New York Stock Exchange and United States weather bureau reports.

3 P M—Short musical program. Speaker furnished through the courtesy of the Parent-Teacher Association of the San Francisco bay district.

4 TO 5:30 P M—Hotel St. Francis Dance Orchestra, San Francisco.

6:45 P M—Final reading, stock exchange and weather reports, and news items.

8 P M—Educational program, with musical numbers by the California Trio. Courses in agriculture, Spanish, music, economics and literature.

**KLX—Oakland Tribune, Oakland (509 Meters)**

7 TO 7:30 P M—News items, United States weather bureau bulletin, market and financial news.

8 TO 10 P M—Program of talks by University of California summer school professors and music broadcast through KLX from Stephen's Union Hall, University of California campus.

**KLS—Warner Bros., Oakland (360 Meters)**

11:30 A M TO 1 P M—Phonograph selections.

**DISTANT STATIONS**

**WBAP—Fort Worth Star-Telegram, Fort Worth, Tex. (476 Meters)**

9:30 TO 10:45 P M—Concert by Mrs. Herman Church and her mandolin orchestra. (G. C. A.)

**KFOA—Rhodes Co., Seattle (455 Meters)**

8:30 P M—Seattle Chamber of Commerce night, presenting program given under direction of Mrs. G. O. Guy.

**KGW—Morning Oregonian, Portland (492 Meters)**

11:30 A M—Weather forecast.

3:30 P M—Literary program by Portland Library Ass'n.

7:15 P M—Police reports.

7:30 P M—Baseball scores, weather forecast and market reports.

8 TO 10 P M—Concert featuring Mitylene Fraker, contralto; Robert L. Stites, baritone; Jessie Elizabeth Elliott, pianist.

**KFI—Earl C. Anthony, Inc., Los Angeles (469 Meters)**

5 TO 5:30 P M—Evening Herald news bulletins.

5:30 TO 6 P M—Examiner news bulletins.

8 TO 9 P M—Evening Herald concert.

9 TO 10 P M—Examiner concert.

10 TO 11 P M—Ambassador-Cocanut Grove Orchestra.

Tuesday, July 1

**KPO—Hale Bros., San Francisco (423 Meters)**

1 TO 2 P M—Rudy Selger's Fairmont Hotel Orchestra.

2:30 TO 3:30 P M—Organ recital by Theodore J. Irwin.

Fox trot, Mamma Loves Papa; operatic selection, Coppelia; light opera selection, Queen's Handkerchief; popular waltz song, When

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Lights Are Low; selection, melodies of the south; Intermezzo; selection, popular melodies; song melody, Mighty Lak' a Rose; fox trot, Hilo-Hilo.

4:30 TO 5:30 P M—Rudy Selger's Fairmont Hotel Orchestra.

5:30 TO 6:30 P M—Children's Hour: The Gray Terror; Why the Swallow Builds on the Wall; The Story of the Cod Fishermen. Song, A Smile Will Go a Long, Long Way; Dorothy Dooley.

7 TO 7:30 P M—Rudy Selger's Fairmont Hotel Orchestra.

8 TO 10 P M—Program by San Francisco Choral Union, under direction of Caleb Lindquist.

Piano solo, Transcription of Waltz; Edna Linkowski.

Vocal selection, Come Where the Lilies Bloom; chorus of 30 mixed voices.

Soprano solo, The Lord Is My Light; Ethel Richards Brown.

Cornet solo, Intermezzo; S. Hasselroth.

Soprano solo and chorus, Great Is Jehovah; Violet Cowger, soloist; chorus of 30 mixed voices.

Bass solos, California's Calling Me; Armorer's Song ("Robin Hood"); H. Victor Vogel; LeRoy Henshaw, accompanist.

Vocal selection, In the Garden of Your Heart; chorus of 30 mixed voices.

Violin solos, Hindu Chant; Mazurka de Concert; Francisca Alsing.

Alto solo and chorus, Hark, Hark, My Soul; Mrs. H. W. Maxwell, soloist; chorus of 30 mixed voices.

Soprano solos, Know Thou Not That Fair Land ("Mignon," opera); Cradle Song; Villanelle; Violet Cowger.

Vocal selection, Spirit Immortal (from "Atilla"); bass solo, H. Victor Vogel; soprano solo, Mrs. John Ellis; tenor solo, Samuel Hasselroth; chorus of 30 mixed voices.

Tenor solos, Charity; Star Eyes; Erwin Holton.

Contralto solos, Come, Live With Me; My Lindy Lou; Annae K. Blockly.

Vocal selection, Hallelujah Chorus (from "The Mount of Olives"); chorus of 30 mixed voices.

10 TO 11 P M—E. Max Bradfield's Versatile Band.

**KGO—General Electric Co., Oakland (312 Meters)**

1:30 P M—New York Stock Exchange and United States weather bureau reports.

4 TO 5:30 P M—Concert Orchestra of the Hotel St. Francis, San Francisco.

6:45 P M—Final reading, stock exchange and weather reports, and news items.

8 TO 10 P M—Instrumental selection, March Turque, Neapolitaine Four.

Contralto solos, Lullaby; Slumber Boat; Mrs. Jo S. Mills.

Piano solos, Gavotte (from "The Genie en Aulis"); Sousols; Wilhelmina Wolthus.

Song cycle for tenor, from Tennyson's "Maud"; music by Whelpley; Birds in the High Hall Garden; Catch Not My Breath (recitative); Go Not Happy Day (aria); I Have Led Her Home; Ernest H. McCandlish.

Cornet solos, Caprice Fantastique; In the Gloaming; David C. Rosebrook.

Norwegian songs for dramatic soprano, Aegret Pjeld Sang; Jeg elsker dig; Lilly Aurora Stad, accompanied by Maynard S. Jones of the Arrillage Music College, San Francisco.

Baritone solos, Kashmiri Song; The Postilion; Elmer Ahl (16-year-old pupil of Homer Henly).

Mezzo-soprano solos, Thy Beaming Eyes; The Temple Bells; Maxin Simmen (pupil of Homer Henly).

Cello solos, The Swan; A Dream; Joziena Van der Ende.

Address, "The Forest Problem," ex-Gov. George C. Pardee.

Baritone solo, The Lost Chord; Howard S. Hansen.

Coloratura soprano solos, Chanson Provencale; By the Waters of the Minnetonka; Elizabeth Stiles Gallie.

Cornet solos, Inflammatus (from "Stabat Mater"); Love's Old Sweet Song; David C. Rosebrook.

Bass solos, Queen of the Earth; The Deathless Army; Charles A. Steel.

Norwegian songs for dramatic soprano, Saterjentens Sondag; Paal paa Hagen; Lilly Aurora Stad.

Reading, Out to Old Aunt Mary's, Perry Riley.

Instrumental selection, Wiener Blut; Neapolitaine Four.

Coloratura soprano solos, Il Bacio; The Little Damsel; Elizabeth Stiles Gallie.

Piano solos, Grand Polonaise in E Flat Minor; Poncinello; Wilhelmina Wolthus.

Contralto solos, In the Time of Roses; Last Night; Mrs. Jo S. Mills.

Tenor solos, Asthore; Kerry Dance; Ernest H. McCandlish.

Instrumental selection, Egyptian Ballet No. 2, Neapolitaine Four.

10 P M TO 1 A M—Hotel St. Francis Dance Orchestra.

**KLX—Oakland Tribune, Oakland (509 Meters)**

3 TO 5 P M—Baseball, all leagues.

7 TO 7:30 P M—News items, United States weather bureau bulletin, market and financial news.

**KLS—Warner Bros., Oakland (360 Meters)**

11:30 A M TO 1 P M—Phonograph selections.

**DISTANT STATIONS**

**WBAP—Fort Worth Star-Telegram, Fort Worth, Tex. (476 Meters)**

9:30 TO 10:45 P M—Concert by Jack Davis, pianist, of Dallas. (G. C. A.)

**KFSG—Angelus Temple, Los Angeles (278 Meters)**

8 TO 9 P M—Great Auditorium service; sermon by Almee Sample McPherson. Address by B. F. Pearson, superintendent of Southern California Edison Co., assisted by artist singers and the Edison Silver Band of 40 members.

9 TO 10 P M—Gray Studio program, furnished by Swanee Jubilee

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San Francisco Examiner—360 Meters

Daily Except Saturday and Sunday

9:05 A M—Weather forecast.

11:00 TO 11:30 A M—Market reports.

8:30 P M—Financial and garden hint broadcast.

6:00 TO 6:20 P M—Financial and garden hint broadcast.

6:40 P M—Weather forecast.

Saturday Only

9:05 A M—Weather forecast.

6:00 TO 6:20 P M—Financial and garden hint broadcast.

6:40 P M—Weather forecast.

Sunday Only

9:05 A M—Weather forecast.

6:45 P M—Weather forecast.

Additional Friday

5:45 TO 6:00 P M—Health bulletin.

Singers: Margaret Knox McCraw, contralto; Gloria Trio of Pasadena, Evening meditation.

10 TO 10:30 P M—Organ recital by Roy Reid Brignall.

**KILJ—Los Angeles Times, Los Angeles (395 Meters)**

8 TO 9 P M—De Luxe program.

9 TO 10 P M—Program presenting Charlie Wellman, tenor, and Bill Hatch, pianist. Dr. Thomas Lutman, speaker.

10 TO 11 P M—Art Hickman's Dance Orchestra from the Biltmore Hotel.

**KGW—Morning Oregonian, Portland (492 Meters)**

11:30 A M—Weather forecast.

3:30 P M—Children program.

7:15 P M—Police reports.

8 P M—Baseball scores, weather forecast and market reports.

8 TO 9 P M—Concert by entire 65-piece band, Elks' Lodge No. 142, Portland, Or. W. A. McDougall, director.

**KFI—Earl C. Anthony, Inc., Los Angeles (469 Meters)**

5 TO 5:30 P M—Evening Herald news bulletins.

6:30 TO 6:45 P M—Examiner news bulletins.

6:45 TO 7:30 P M—Vocal concert.

8 TO 9 P M—Ambassador-Cocanut Grove Orchestra.

9 TO 10 P M—Examiner concert.

10 TO 11 P M—Harry Porter, baritone, arranging concert.

**Wednesday, July 2**

**KPO—Hale Bros., San Francisco (423 Meters)**

1 TO 2 P M—Rudy Selger's Fairmont Hotel Orchestra.

2:30 TO 3:30 P M—Jack Falt's Estrella Cafe Orchestra.

4:30 TO 5:30 P M—Rudy Selger's Fairmont Hotel Orchestra.

5:30 TO 6:30 P M—Children's Hour: The Deep Sea Diver; The First Apple Dimpling. Piano solos by pupils of Emma Steinegger: Petite Gavotte, Ruth Reis, 8 years old; Austrian Song, Catherine Flavell, 11 year old; Elfing Dance, Helen Reis, 11 years old.

7 TO 7:30 P M—Rudy Selger's Fairmont Hotel Orchestra.

8 TO 11 P M—E. Max Bradfield's Versatile Band.

**KGO—General Electric Co., Oakland (312 Meters)**

1:30 P M—New York Stock Exchange and United States weather bureau reports.

3 P M—Short musical program. Address, "The Possibilities of Collaborative Writing," by Louis L. de Jean.

4 TO 5:30 P M—Concert Orchestra of the Hotel St. Francis, San Francisco.

6:45 P M—Final reading, stock exchange and weather reports, and news items.

**KLX—Oakland Tribune, Oakland (509 Meters)**

3 TO 5 P M—Baseball, all leagues.

7 TO 7:30 P M—News items, United States weather bureau bulletin, market and financial news.

8 TO 10:20 P M—Studio program with overture by American Theater Orchestra.

Vocal selections, The Creole Love Song; Pale Moon; I hear a Thrush at Eve; Julia Knight Peterson, mezzo-soprano; Mrs. Fred Curtis Mendenhall, pianist.

Piano solos, Calm as the Night; Berceuse; Romance; Doris Richie, pupil of Mrs. H. L. Krick.

Vocal selections, selected; Rebecca Schiebel, playing her own accompaniment.

Instrumental selections, A Little Bit of Heaven; The Chick of Her Little Brogans; When Irish Eyes Are Smiling; Julia Knight Peterson, mezzo-soprano; Mrs. Fred Curtis Mendenhall, accompanist.

Piano numbers, Salon Etude (for

left hand alone); Song of India.

Vocal selections, selected; Rebecca Schiebel, accompanying herself at piano.

Talk on fire protection by representative of United States forest service.

Overture by American Theater Orchestra, Owen Sweeten, directing.

Following the overture the American Theater Orchestra will play incidental music until 10:10 o'clock, when Clement Barker will broadcast organ numbers.

**KLS—Warner Bros., Oakland (360 Meters)**

11:30 A M TO 1 P M—Phonograph selections.

**DISTANT STATIONS**

**WBAP—Fort Worth Star-Telegram, Fort Worth, Tex. (476 Meters)**

9:30 TO 10:45 P M—Concert by the old-time fiddle band of Krum, Tex. (G. C. A.)

**KFOA—Rhodes Co., Seattle (455 Meters)**

8:30 P M—Vocal and instrumental recital by Mrs. Ralph Ostrom, soprano; Mildred Johnson, soprano, and Kenneth Lyman, pianist.

**KHJ—Los Angeles Times, Los Angeles (395 Meters)**

8 TO 10 P M—Program presented through the courtesy of Barker Bros., arranged by Claire Forbes Crane, The Gaylord Trio, Miss Wade, manager.

Dr. Mars Baumgardt, lecturer.

10 TO 11 P M—Art Hickman's Dance Orchestra from the Biltmore Hotel.

**KGW—Morning Oregonian, Portland (492 Meters)**

11:30 A M—Weather forecast.

3:30 P M—Talk by Jeanette P. Cramer, home economics editor of the Oregonian.

7:15 P M—Police reports.

7:30 P M—Baseball scores, weather forecast and market reports.

8 P M—Recital by Mrs. Henry W. Metzger, soprano.

10 P M—Dance music by George Olsen's Metropolitan Orchestra of the Hotel Portland. Intermission solos by Avis Olson Armstrong and Clarence Hartman, pianists.

**KFI—Earl C. Anthony, Inc., Los Angeles (469 Meters)**

5 TO 5:30 P M—Evening Herald news bulletins.

6:30 TO 6:45 P M—Examiner news bulletins.

6:45 TO 7:30 P M—Nick Harris Detective Stories and concert.

8 TO 9 P M—Evening Herald concert.

9 TO 10 P M—Examiner concert.

10 TO 11 P M—Hollywood Orchestra.



# Experts Disagree On Speed of Radio

From both ends of the United States come sounds of a clash over the speed of the radio wave.

It started with the announcement from San Francisco that radio waves are slower than light waves. It was made by Capt. T. J. J. See, professor of mathematics in the U. S. navy, government astronomer at the Mare Island navy yard and authority on the ether theory.

Almost immediately comes the denial by John V. L. Hogan, one of the foremost radio authorities in the country. From his office in New York he sends out the declaration that to think of radio waves traveling at a lower speed than that of light is absurd.

Capt. See concluded that the speed of radio was 165,000 miles a second after he had conducted some positive tests.

But, says Hogan, "the speed of light was determined accurately by several scientific investigators many years ago, and the speed of longer electro-magnetic waves, in which category the radio waves fall, has been conceded by leading authorities to be the same. In fact, light waves are generally understood to be nothing more nor less than exceedingly high-frequency electrical vibrations in space, and all electro-magnetic waves, whether of high or low frequency, have been shown by analysis and experiment to have the same speed."

## Radio Handouts

The announcer and players at WTAM, Cleveland, never buy their evening meals. They get free contributions from fans from Cleveland and its vicinity and even from distant points.

## Use Solder, Cut Squawks

LOOSE connections or badly soldered joints are the greatest causes of the exasperating noises you get in your phones.

If there is any corrosion in the joints, a scratchy noise results. If the prongs of the tubes do not fit properly, or they are corroded, it is another cause for scratchy noises.

Loose binding posts cause the same noise. Loose phone connections are another annoyance.

The remedy lies in tightening all binding posts and resoldering all loose joints with the use of as little flux as possible.

## Long Amateur Reach

The longest two-way contact ever made on amateur waves was effected recently during the Pan-American amateur tests. Carlos Baggio of Bernal, near Buenos Aires, was able to be heard by and hear J. H. O'Meara of Gisborne, New Zealand. He was also heard by Everett H. Gibbs of Framingham, Mass.

## Germans in Italy

The eight firms that have been formed for broadcasting in Italy have turned to German radio manufacturers for their supplies. This came about after Americans failed to land contracts there and the British could not become interested in that field.

## NO HORN



A loud speaker without horns, and sending out sounds in two directions, is the invention of Dr. C. W. Hewlett of Schenectady. Dr. Hewlett is shown here with a small form of his invention.

## Radio News Gatherers

Radio amateurs have had a chance to demonstrate the reliability of this science as a news gathering medium. Some of them have been collecting news for the Milwaukee Journal.

Sounds of thunderstorms, rain, wind and other natural phenomena are to be imitated and broadcast from a Parisian studio.

# No Horns Are Needed On New Loud Speaker

## Radio Is Held Cause of Rain

WELLINGTON, O., June 30.—It's radio that may be causing so much rain the farmers have been getting hereabouts.

This unique claim comes from Charles B. Weedman of this city, who has been trying to find a cause for the wet weather encountered this year.

"We know that radio is becoming extensive," he says, "and we know that electricity does play havoc in many ways, and I am fully convinced that this weather will continue until the extensive use of radio is checked."

It's up to the scientists to find a way out, he adds.

## Famed Bells on Radio

The Carillon of Malines, one of the world's most famous chimes, will be broadcast through 2LO in London and may even be caught on this side of the ocean. The tones of the bells will be relayed to Brussels, broadcast there and picked up in London.

## Tickers for Fishermen

Passage of a pending bill in the Massachusetts legislature may result in the installation of radio tickers on fishing schooners. Thus fishermen may keep in close touch with fish price quotations and make the size of their catch conform with the demand.

SCHENECTADY, N. Y., June 30.—A single loud speaker in the center of a large gathering may replace the many horns heretofore attached together to throw sounds in all directions.

The new instrument is the invention of C. W. Hewlett, physicist of the General Electric laboratories here. Not only does the new loud speaker send out voices from two sides at the same time, but it has no need for horns.

One of the first uses for this instrument is its installation in the tourist camping grounds here. It is being used to furnish entertainment to the motorists, broadcast by the city.

The device consists of two large coils of wire mounted close together and separated by a thin aluminum diaphragm. There are no permanent magnets in it, and it merely causes the diaphragm to vibrate directly through radial interaction of the magnetic field produced by the coils.

## Drawing by Radio

Radio fans listening in on WLAG, Minneapolis, recently, took part in a sketching contest. The profile of Miss Eleanor Poebler, WLAG's director, was the subject. Stanton King, of Minneapolis, won first prize.

## Mostly Crystal Sets

Sixty-five per cent of the receivers in England are crystal sets, reports the British Broadcasting Co. Of the rest, 7 per cent have one tube, 12 per cent two tubes and only 2 per cent three tubes.

# WEEK'S AIR PROGRAMS, CONTINUED

(Concluded From Page 2)  
forecast and market reports.  
8 P M—Concert arranged by Mrs. Fred L. Olson.  
10 P M—Dance music by George Olsen's Metropolitan Orchestra of the Hotel Portland.

KFI—Earl C. Anthony, Inc., Los Angeles (469 Meters)  
5 TO 6:30 P M—Evening Herald news bulletins.  
6:30 TO 6 P M—Examiner news bulletins.  
6:45 TO 7:30 P M—Y. M. C. A. concert and lecture.  
8 TO 9 P M—Ambassador Hotel Concert Orchestra.  
9 TO 10 P M—Examiner concert.  
10 TO 11 P M—Leontine Redon, mezzo-soprano, and others.

## Friday, July 4

KGO—General Electric Co., Oakland (312 Meters)  
1:30 P M—New York Stock Exchange and United States weather bureau reports.  
3 P M—Special Fourth of July program.  
4 TO 5:30 P M—Concert Orchestra of the Hotel St. Francis, San Francisco.  
6:45 P M—Final reading, stock exchange and weather reports, and news items.

KLX—Oakland Tribune, Oakland (509 Meters)  
3 TO 5 P M—Baseball, all leagues.  
8 TO 10 P M—Special Fourth of July program, featuring Pala's KLX Hawaiians, a jazz band; readings and appropriate recitations with firecrackers and a balloon ascension. Special request—Do not be surprised at what you hear on this special program.

KLS—Warner Bros., Oakland (360 Meters)  
11:30 A M TO 1 P M—Phonograph selections.

## DISTANT STATIONS

WBAP—Fort Worth Star-Telegram, Fort Worth, Tex. (476 Meters)  
9:30 TO 10:45 P M—Concert by Fred Wagner and his Hawaiian Trio. (G. C. A.)  
KFGC—Angelus Temple, Los Angeles (278 Meters)  
8 TO 9 P M—Crusaders' rally, "National Address" by Judge Carlos B. Hardy, justice superior court; Ada Lantz, soprano; Temple Silver Band; evangelistic address by Almee S. McPherson.  
9 TO 10 P M—Gray Studio program, courtesy Maude Reeves-Barnard and pupils; Angelus Temple Silver Band, under direction of Gladwyn N. Nichols, "Good-Night Psalm."  
KHL—Los Angeles Times, Los Angeles (395 Meters)  
8 TO 10 P M—Program presented through the courtesy of Barker Bros., arranged by Claire Forbes Crane.  
KGW—Morning Oregonian, Portland (492 Meters)  
11:30 A M—Weather forecast.  
3:30 P M—Woman's program.  
7:15 P M—Police reports.  
7:30 P M—Baseball scores, weather forecast and market reports.  
10:30 P M—Hoot Owls.  
KFI—Earl C. Anthony, Inc., Los Angeles (469 Meters)  
5 TO 6:30 P M—Evening Herald news bulletins.  
6:30 TO 6 P M—Examiner news bulletins.  
6:45 TO 7:30 P M—Varied musical program.  
8 TO 9 P M—Evening Herald concert.  
9 TO 10 P M—Examiner concert.

10 TO 11 P M—Patriotic concert.  
11 P M TO 12 M—Ambassador-Cocoanut Grove Orchestra.

## Saturday, July 5

KPO—Hale Bros., San Francisco (423 Meters)  
6:30 P M TO 12 M—Dance music by Art Weidner's Orchestra. KPO Trio during intermissions.  
KGO—General Electric Co., Oakland (312 Meters)  
1:30 P M—New York Stock Exchange and United States weather bureau reports.  
4 TO 5:30 P M—Concert Orchestra of the Hotel St. Francis, San Francisco.  
8 TO 10 P M—Instrumental selection, Entr'acte (from "Carmen"); Neapolitane Four. Welsh songs for tenor, Nant y myn ydd; Hirth; Garfield Roberts. Soprano aria, Jewel Song (from "Faust"); Olive Richards. Piano solo, Scherzo in E Flat Minor; Wilhelmmina Wolthus.

Instrumental selections for string quartet, Quartet Artistique: Festo Aspre, violin; Ethyl Guyon, flute; Arthur Landesen, cello; Leonore Ewald, piano.  
Tenor aria, Del miei bollenti spiriti (from "Traviata"); Louis Gordon. Contralto solos, Mary of Argye (Scott melody); Mary; Mabel Walsh. Instrumental selection, Intermezzo-Rococo; Neapolitane Four. Tenor solo, Serenata; Carlo Mennutti (pupil of Prof. John de Martini of San Francisco). Piano solo, Impromptu; Wilhelmmina Wolthus.

Baritone aria, Dio Possente (from "Faust"); Eardley Richards. Instrumental selections for string quartet; Quartet Artistique. Welsh songs for tenor, Eaner ein gylad; Yr hen gerddor; Garfield Roberts.  
Duet for soprano and baritone, Piagi (from "Rigoletto"); Olive and Eardley Richards.  
Accordion solo, Light Cavalry Overture; John Tossoli (pupil of Prof. A. L. Daniels, San Francisco). Baritone solo, Secret; A. Delbino. Contralto solo, O Rest in the Lord (from "Elijah"); Mabel Walsh. Tenor solo, Macushia; Louis Gordon.

Readings of original poems by Louis L. de Jean, the aviator-poet.  
Accordion solo, popular medley; John Tossoli.  
Duet for tenor and baritone, Solenne in quest'ora (from "Forza del Destino"); Carl Mennutti and A. Delbino. Instrumental selection, Eternelle Ives; Neapolitane Four.  
10 P M TO 1 A M—Hotel St. Francis Dance Orchestra.  
KRE—Berkeley Gazette (278 Meters)  
8 P M TO 12 M—Claremont Hotel dance orchestra.

KLS—Warner Bros., Oakland (360 Meters)  
11:30 A M TO 1 P M—Phonograph selections.

## DISTANT STATIONS

KLX—Oakland Tribune, Oakland (509 Meters)  
3 TO 5 P M—Baseball, all leagues.  
7 TO 7:30 P M—News items, United States weather bureau bulletin, market and financial news.  
WBAP—Fort Worth Star-Telegram, Fort Worth, Tex. (476 Meters)  
7 TO 7:40 P M—Review of the interdenominational Sunday school lesson and radio Bible class by Mrs. W.

F. Barnum.  
KHL—Los Angeles Times, Los Angeles (395 Meters)  
8 TO 10 P M—De luxe program.  
10 TO 11 P M—Art Hickman's Dance Orchestra from the Biltmore Hotel.  
KGW—Morning Oregonian, Portland (492 Meters)  
11:30 A M—Weather forecast.  
3 P M—Children's program.  
10 P M—Police reports, baseball scores, weather forecast and dance music by George Olsen's Metropolitan Orchestra of the Hotel Portland (two hours).

KFI—Earl C. Anthony, Inc., Los Angeles (469 Meters)  
5 TO 6:30 P M—Evening Herald news bulletins.  
6:30 TO 6 P M—Examiner news bulletins.  
6:45 TO 7:30 P M—Vocal concert.

## JUST WAVELETS

All Canadian broadcasting stations are identified by the initial call letter C.

Keep wires from slipping off a winding by dropping a little sealing wax on the ends.

There are 10 automobiles for every 73 persons in the United States.

French amateur has been heard from Paris to Algeria with a two-tube receiver, on 35 meters.

Station WIP, Philadelphia, reports its Esperanto program recently was heard in France.

Central Dominican railroad reports it runs its trains on the time transmitted through KDKA at East Pittsburgh, Pa.

Auto insurance premiums for 1923 amounted to nearly \$225,000,000. Losses of \$100,000,000 were paid out.

WEAF, New York, will broadcast a course on the Old Testament every Sunday at 5.

A new form of stethoscope sends the heart beats by radio to the ears of the physician.

Jamaica prohibits radio transmission or reception.

Radio is still unknown in Sicily.

Parisian music teachers report more direct business as a

result of broadcasting concerts they have been giving.

If a soft, bluish glow appears in the tubes the plate voltage is too high.

Tubes work best when mounted upright.

There are 17,300 licensed radio amateurs in this country.

Broadcasting stations in the United States number 584.

Texas leads in the number of broadcasting stations with 42.

Every state in the Union has one or more broadcasting stations.

Radio committee at Ceylon has recommended government broadcasting of radio.

Tremont Baptist Church, Boston, is to broadcast under call letters WDRR on 256 meters.

## Million Point Super-Crystals

are unconditionally guaranteed to be the best for distance and there is no louder crystal made. Sold by jobbers and first class dealers everywhere. Sample postpaid, 40c. Manufactured by

HUBBARD  
LABORATORIES  
1944 Cabrillo St.  
San Francisco

Love Songs, "Love Dream": piano solos: "Rigoletto Fugue and Fantasy," "Rhapsody No. 12," List; "F Sharp Nocturne"; contralto solos: "Fortune Hunter," "Sittin' Thinkin'," "God Is My Shepherd," "Gloria," Eva E. Atkinson; piano solos, Eva Garcia: "Melody," "Fountain."  
7:30 P M—Non-sectarian church services, First Congregational Church of San Francisco, Dr. Fred F. Shannon, minister. Uda Waldrop, organist.

KPO—Hale Bros., San Francisco (423 Meters)  
11 TO 12—Organ prelude, Theodore J. Irwin; non-sectarian church services, Rev. T. Lee Jr., pastor South Methodist Church, San Francisco; Mrs. Gyn Jones Tebault, contralto.  
8:30 TO 10:30 P M—Rudy Seliger's Fairmont Hotel orchestra.

KLS—Warner Bros., Oakland (360 Meters)  
Church services, Rev. R. Chambers, pastor, Radio Church of America.  
KLX—Oakland Tribune, Oakland (509 Meters)  
9:30 TO 10 P M—Non-sectarian church services.

## Artists Dress Up

Atmosphere will be maintained at future concerts broadcast from KDKA, Pittsburg, by having the artists "appear" in costume. The concerts will be a series of popular melodies from the past.

# RADIO

We carry a full line of sets—RADIOLAS, RADYNE, KARDEN, KODEL—in stock at all times. Call or write for demonstration.

P. A. SMITH CO.  
638 4th St.  
San Francisco Sutter 4151

## Myers Tubes

Practically Unbreakable. Each tube is a detector, amplifier and oscillator.

At Your Dealer  
or From Us  
LIST PRICE,  
\$5  
Drawal  
Corporation  
41 East 26th St., New York



## RADIO SALES BOOMING IN HOLY LAND

Even the Holy Land has succumbed to the radio, "getting distance" now being one of the popular amusements of Palestine, according to a report received by the Palestine Foundation Fund from Jerusalem. The installation of radio apparatus in Palestine was given official sanction by a government ordinance issued June 3, the report stated, the ordinance permitting all inhabitants owning their homes to install either receiving or broadcasting instruments.

The demand for radio sets has increased greatly since the issuance of the government order, according to the report. Radio programs are all given in Hebrew, for the ancient language of the Bible has once more become the every day language of Palestine, as a result of Jewish efforts to rebuild the Jewish Homeland. The Jerusalem Opera Company, whose repertory includes most of the well-known Italian, French and German operas, all given in Hebrew, furnishes some of the most popular radio program numbers.

The British government is planning to install a powerful broadcasting and receiving station on the Mount of Olives, where Government House, the home of the British high commissioner, Sir Herbert Samuel, is situated, to keep the home office in close touch with Palestine. The Zionist executive also plans installing a station to reach the headquarters of the World Zionist Organization in London.

## Detroit Police Use Radio on Cars

DETROIT, Mich., June 30.—Radio equipped automobiles with loud speaker attachments have been put into active use by the police department in this city. Three big touring cars, reported to be capable of making a speed of more than eighty miles an hour, have been equipped with five tube neutrodyne sets. These fit in a compartment in back of the driver's seat.

Outwardly, there is nothing to show that the cars have radio sets as the antenna is concealed in the top and the frame of the car acts as a counterpoise. Each car has a windshield seven-eighths of an inch thick, made of bullet proof glass. Two gun racks, on the heel-boards of the front and rear seats, each carry a sawed-off shot gun.

## HAYNES HOOKUP CLARIFIES

BY ISRAEL KLEIN

NEA Service Radio Editor  
F, instead of long distance records, clarity and selectivity is sought with a simple receiver, the Haynes circuit can fill the bill.

It is nothing more than a simple, three-circuit regenerative tuner, but it is so constructed that there is a minimum of loss or interference and a maximum of volume and clearness from a single tube.

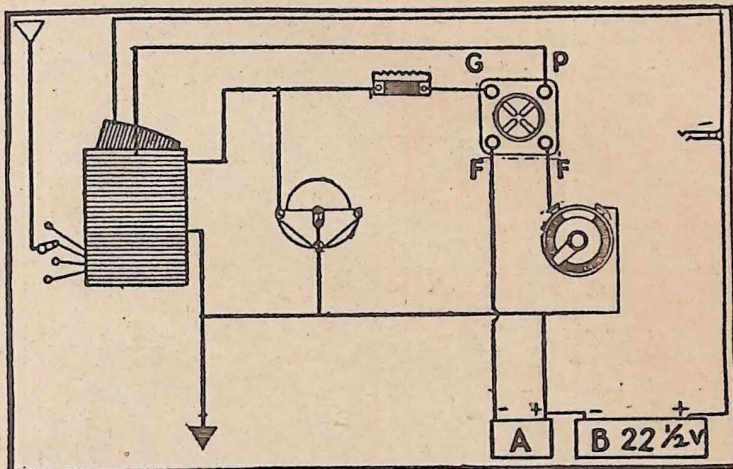
Two parts of this circuit are important—the inductance and the variable condenser. For the inductance, a Haynes 180-degree bank-wound variocoupler has been found most efficient. Enough windings should be taken off the rotor to leave only 35 turns there, while four taps are taken off the first eight turns of the aerial side of the stator coil, a tap at every second turn.

The condenser, also a Haynes, has 23 plates and a capacity of not more than .00023 mfd. But any good make of condenser with similar capacity should do. Care should be taken, however, that it is a low-loss condenser.

### Other Parts

Outside of these most important parts, the set consists of the following regular instruments:

One 6-ohm rheostat.  
One grid leak, 2 megohms, and condenser, .00025 mfd.  
One tube socket.



Hookup diagram of Haynes circuit.

One switch, four switch points and two stops.

One open circuit jack, or a closed circuit jack if an amplifier is added. Or, two phone binding posts.

Six other binding posts for aerial, ground and batteries.

A 7 by 15-inch panel, with corresponding cabinet.

Connecting bus wire.

Either a UV-200 or a WD-11 or WD-12 tube may be used.

### How to Tune In

The operation is as simple as any other similar circuit. Put the switch knob on the point leading to the extreme end of the primary coil. Turn on the

rheostat until a slight hiss is heard, then turn back until hiss disappears. With a dry battery tube, the filament should show a dull red glow.

With the tickler dial at zero, rotate the condenser until a station is heard. Then the tickler is turned to strengthen the signal. If the signal becomes weaker instead of stronger, reverse the tickler connections.

If some station happens to interfere, turn the switch lever to the second point and re-tune with condenser and tickler dials. But best reception will be obtained with the entire length of the primary coil.

## Broadcasting Has Own Censorship

What goes into the air and is received by radio fans is subject to a censorship keener and more arbitrary than any other check.

For at any time a listener may suddenly strike a minute or two of silence during a broadcast program he has been receiving with remarkable volume and selectivity.

The reason is, the radio censor has shut off the power on the speaker. And the reason for that is, the speaker has just begun to say something which the radio censor believes is not suitable for transmission.

And what is suitable for transmission is entirely up to the man listening in at the broadcasting station, with his hand ready to turn the switch.

## Relay on Short Waves

Ordinary methods of relaying programs from special places, such as churches and lecture halls, require the use of direct telephone lines. Station WGY, Schenectady, has a portable short wave transmitter which it installs in the churches, theaters and concert halls to relay their programs by short-wave channels instead of wires.

## Tropics no Barrier

Static-filled tropics proved to be no barrier to the recent signals exchanged between amateurs of North and South America. Nearly a dozen American amateurs heard the calls of Carlos Braggio, of Bernal, Argentina, when he communicated successfully with Norman R. Weible, of Collingswood, N. J.

## Airship Operator Chats With 'Hams'

That radio messages can come from a point high up in the air as well as from ground stations was shown recently when the operator on the navy's big airship Shenandoah gossiped for some time with radio amateurs below.

One of the most complete radio outfits ever installed on aircraft is in operation on the Shenandoah. Facilities allow the use of practically all wavelengths from 100 meters to long waves of big commercial stations.

The short wave transmitter can be used, if needed, in emergency during flights. Broadcast programs are received also.

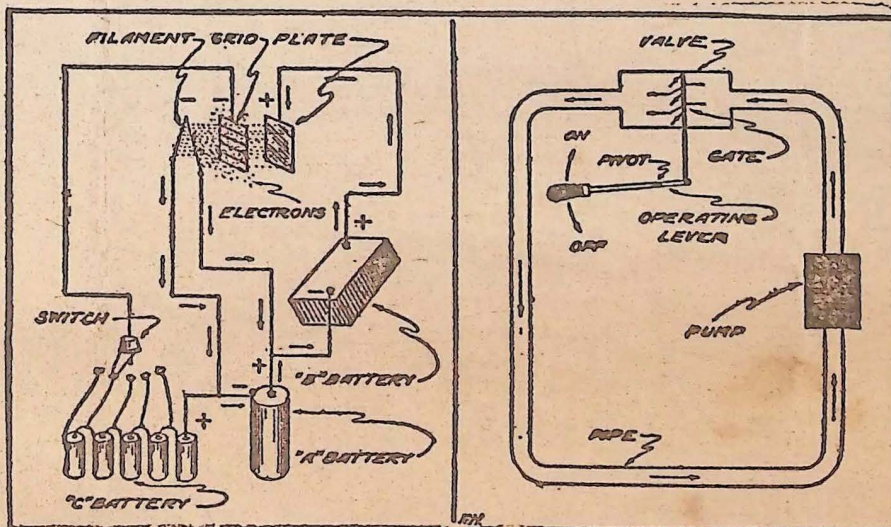
Try grounding the cores of the transformers for quieter operation.

## RADIO FROM THE GROUND UP

Used in almost every receiving set and in every broadcasting station, the vacuum tube is no doubt the very heart of our modern radiophone system of communication. Its construction is not complicated, nor is it difficult to understand its functioning. In England the tube is called a "valve," a name that is really more true to its name. The tube really is a valve, a device by which a small amount of energy turns on or shuts off a far greater amount of power.

The vacuum tube's peculiar properties depend upon the presence within it of infinitesimal particles of electrical energy called electrons. The hot filament constantly gives off these electrons.

In the tube the pressure is made very low by pumping almost all of the air out. This is done so that the air pressure will have no restraining effect upon the electrons. If a sheet of metal be placed in the tube and given a positive charge of electricity by connecting it to the positive end of a battery of 20 to 40 volts, the electrons will immediately be attracted to this plate because they themselves are negative. Here is where an apparently enfusing thing occurs, for although the electrons travel from the filament to the plate, the actual current from the "B" battery connected to the plate flows in the opposite direction.



These two diagrams show the mechanism and operation of a tube and a comparison with the pipes and valve operation of an ordinary water system.

The "A" battery supplies current for heating the filament, while the "B" battery keeps a positive charge on the plate. Between the filament and the plate is mounted a wire screen or network known as the "grid," this being the valve part of the vacuum tube. If there is no electrical charge on this grid, the electrons shoot right through, between the wires, to the plate. But if a negative charge be placed on it by a battery connected externally to the filament, the negative electrons are repelled by the negative charge on

th grid (like charges oppose), and the stream of electrons is reduced. If that negative charge is made stronger by moving a switch to include another cell or two the electronic stream is still further cut down until very little is allowed to flow. And just a small charge on the grid controls perfectly a much stronger current flow, just as the valve handle controls the flow of water.

Vacuum tubes are made in many different forms, with arrangements for illuminating the filament by storage batteries and

by dry cells; other tubes require a large amount of filament current and varying voltages of "B" battery. The grid is usually a wire spiral placed around the filament and the plate a cylinder outside of the grid. These elements are fastened on glass supports, in which the mounting wires are embedded. The tube is useful for detecting radio signals as was the crystal, but the work is far more efficiently done, and it is also employed for amplifying or increasing the loudness of signals already detected.

## S. F. R. C. TO HOLD AUCTION OF RADIO PARTS

The San Francisco Radio Club announces that it will hold an auction of radio parts Thursday, July 10, to which the public is invited. The clubrooms are at 1380 Bush-st.

Owing to a holiday falling on the 4th, there will be no meeting this Thursday night.

6AOU was on the air this week, using 6CMF motor generators.

New on the air is Paul Livingston, Burlingame; his call is 6BDS. During the war he operated station NPG at Goat Island. He has also been a ship radio operator.

6CMM has tucked another feather in his cap. Last week he succeeded in working a "9," Colorado Springs, Colorado, on 5 watts.

6KK has abandoned his idea of putting up a set for some time to come.

6FJ says that he wants it distinctly understood that he has not sold his set, which was rumored recently, as his set is functioning properly.

6UB, who used to be 6QB, is on the air in partnership with 6AFO, operating on 5 watts.

## ANSWERS

Questions addressed to this department will be answered by L. E. Day of the Day Radio Laboratory, 693 Mission-st. No hookups will be printed.

Subscriber, 645 Bay-st, asks: Would like to know whether all wires inside of a tube should light or just filament?

The only wire that should light in a tube is the filament. The fine wires circling the filament are called the grid and should not light up. If it does, the tube is defective and should be returned to your dealer for replacement.

Charles Powers, 2110 Market-st, San Francisco, asks:

Is a crystal set 125 miles distant sufficient to get San Francisco?

The present range of the crystal set is about 25 miles. Suggest you use a single tube set if you wish music that far away.

## LET'S SWAP

These "Swap" advertisements will be published free of cost until further notice in the Monday Radio Magazine of The Daily News. The article to be traded must be radio equipment. Keep the wording concise.

TO SWAP—One-loop aerial and a C-300 detector tube for radio apparatus. 415 Miguel-st. Phone Mission 3611, after 6:30 p m.

TO SWAP—6-volt amplifying tube for set headphones; value \$3 to \$5. P. S. Jones, 1410 Milvia-st, Berkeley. Phone Berkeley 2744J.

TO SWAP—Remler variometer for two 23-plate condensers. H. E. Geay, 2911 Shattuck-av, Berkeley.

TO SWAP—Four tubes, 199 or 261, for a good radio set. Joe Kabb, 154 East-st.

TO SWAP—Tungar 2 1/2-amp. charger, brand new, for magnavox and pay difference for Tungar 6-amp. charger. Martyn, Valencia 1717.

TO SWAP—Three W. D. 12 tubes for 3 U. V. 201 tubes.—Joe Kabb, 154 East-st.

TO SWAP—\$100 Columbia Gramophone, will trade for a radio set. Give good description.—Emile Price, 302 Maple-av, South San Francisco, Cal.

TO SWAP—Two dandy crystal sets, in exchange for phonograph attachment or other parts. H. J. Pratt, 441 Fourth-av. Phone Bayview 7663.

TO SWAP—A dandy crystal set, complete with headphones; almost new; in fine condition; sets all local stations. Phone Market 1412.

TO SWAP—22 1/2 Dutho "B" battery; recharged; all it needs is a charge for a vario-coupler. What have you? John Ward, 571 Santa Clara-av, Alameda.

TO SWAP—Two UV-199 tubes, with adaptors; used less than 2 months; trade for two 201-A tubes. 137 Milton-st, evenings.

TO SWAP—Pair of new Frost headphones (value \$6.50), for a pair of Baldwin phones; will pay the difference. Write to Louis Rugant, 116 Magnolia-st.

TO SWAP—One Remler variometer, 3 honeycomb coils (350-500-850 turns) 1 W. D. twelve tube for two audio frequency transformers, two Cunningham C 301 ampl. tubes, 1 Cunningham C 301 det. tubes or other parts. —F. Rojas, 1688 Ellis-st.