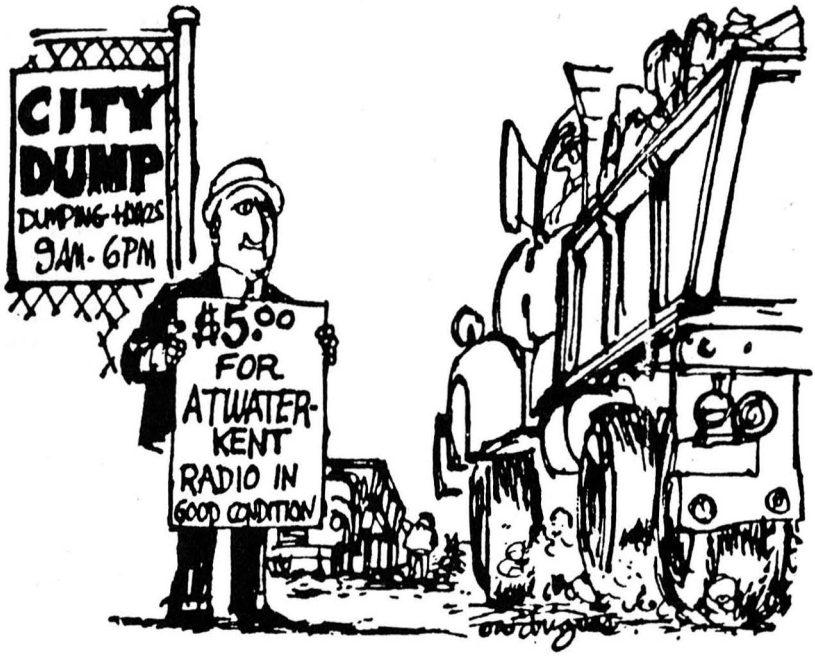
CHRS official

JOURNAL

May-June 1984



CALIFORNIA HISTORICAL RADIO SOCIETY

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THE SOCIETY

The California Historical Radio Society is a non-profit corporation chartered in 1974 to promote the preservation of early radio equipment and radio broadcasting. CHRS provides a medium for members to exchange information on the history of radio with emphasis on areas such as collecting, cataloging and restoration of equipment, literature, and programs. Regular swap meets are scheduled four times a year. For further information, write the California Historical Radio Society, P.O. Box 1147, Mountain View, CA 94042-1147.

THE JOURNAL

The official Journal of the California Historical Radio Society is published six times a year and is furnished free to all members. Articles for the Journal are solicited from all members. Appropriate subjects include information on early radio equipment, personalities, or broadcasts, restoration hints, photographs, ads, etc. Material for the Journal should be submitted to the Editor, Herb Brams, 2427 Durant #4, Berkeley, CA 94704.

MEMBERSHIP

Membership correspondance should be addressed to the Treasurer, John Eckland, 969 Addison Ave., Palo Alto, CA 94301.

MEMBERSHIP RENEWAL

It's time to renew your membership. Membership dues are $10 a year, from June 1 to May 31 of the following year. Payment should be made to CHRS, P.O. Box 1147, Mountain View, CA 94042-1147.

In the coming months we hope to have a continuing expansion and improvement of our Journal. So send in your $10 now and don't miss out!

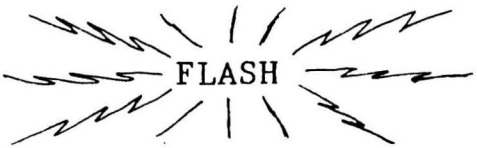
JOIN ME IN A GREAT ADVENTURE

As you can see, we have gone back to the CHRS Journal format, with a noticeable improvement in appearance. We are also in good financial shape, with sufficient funds for further improvement. Also, due to extensive advertising, interest in our Journal is increasing. As always, the quality of our publication remains high.

There is, however, an obstacle to our further success. This is the significant lack of contributors to the Journal. We do not have a staff of writers who can turn out articles at the drop of a hat. Rather, the Journal must depend entirely on contributions from its own members. As a result, the success of our Journal is a direct expression of the interest CHRS members take in researching and sharing information on the early days of radio. The Journal will continue to improve if there is increased participation by our members; it will fail if there is continued lack of interest.

So I appeal to you to take a good look at your collection, go through your old books and magazines, or think back on your own experiences and come up with some article, old ad, photograph, or personal anecdote that will brighten our pages. Share with us your thoughts or knowledge of radio history.

Herb Brams, Editor

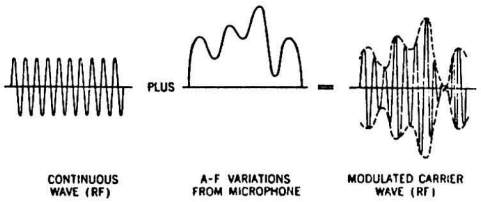


The May 1984 issue of Radio Age has an article and photograph of the very unusual 37-tube Crosley WLW radio. The September 1983 issue covers the 25-tube Zenith Stratosphere. We hope to scoop both of these in the near future with an article and photograph of the 44-tube E.H. Scott Quaranta.

DETECTORS AND DETECTION

Amplitude Modulation (AM): Signals of audio frequency, such as those from a microphone or phonograph, if connected to an antenna, are not radiated appreciably through space. Only radio-frequency signals can be radiated effectively. In radio transmission we modulate (modify) a signal of radio frequency with the audio signal in such a way that it carries the audio information. In amplitude modulation (AM) the amplitude or strength of the radio signal is varied by the audio signal. The variations in amplitude of the modulated radio-frequency signal are made to be an exact copy of the variations of the audio signal. Thus, a loud audio signal, which has large variations in amplitude, is translated into large variations in the amplitude of the radio-frequency signal. An audio signal of high frequency (pitch), which alternates more rapidly than one of low frequency, is translated into rapid variations in the amplitude of the radio-frequency signal.

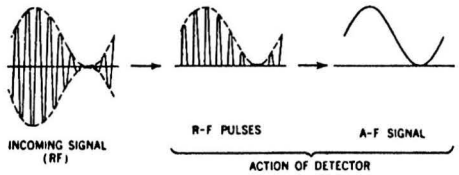
In a radio receiver, the amplitude variations of the radio-frequency signal are translated back into a copy of the original audio signal.



Detection: Detection is the process of recovering audio information from a modulated radio signal. It is carried out by devices or circuits called "detectors." It is obvious that, for AM, we need an amplitude detector; i.e., some device or circuit whose output is proportional to the amplitude of the modulated radio signal. There is, however, no simple device or circuit that can recover the audio signal directly from the amplitude variations of the modulated radio-frequency signal. The problem is solved by rectifying the signal with a diode or similar device. This gives a pulsating direct current whose amplitude variations are the same as that as the original audio signal. The pulsations, which are of radio frequency, are filtered out, leaving a duplicate of the original audio signal.

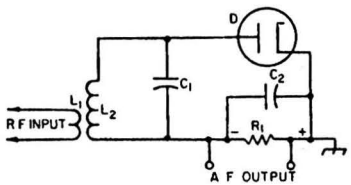
In rectification, an alternating current signal is passed through a device called a rectifier, through which current can flow only in one direction. This removes part of the AC signal,

leaving pulses of current all flowing in only one direction.



Detectors: Detectors are devices that recover the audio (sound) portion of modulated radio waves. AM detectors act primarily as rectifiers, converting the modulated RF signal to a pulsating DC signal that carries the same audio modulation as in the original signal. The pulsations are filtered out, leaving a duplicate of the original audio signal. In AM radios three types of detectors have commonly been used: diode detectors, plate detectors, and grid-leak detectors.

Diode Detectors: The diode detector is the simplest type. This uses a vacuum-tube diode or crystal detector as a rectifier.



Diode Detector

The alternating current RF signal is applied to the diode. The diode allows only half the signal to be passed, allowing a pulsating direct current to develop across the resistor. The variations in amplitude of the RF signal cause corresponding variations in the value of the DC voltage across the resistor. The DC voltage varies in the same way as the original audio signal used for modulation.

The diode detector has the advantages of having low distortion and of not being easily overloaded by strong signals. However, it is not as sensitive as the other two types. Also, it draws current and so loads the preceding circuit, reducing selectivity. These disadvantages can be overcome in other parts of the radio and so the diode detector has been used almost exclusively since the early 1930's.

Plate Detector: The plate detector (or "power" detector) is a triode, tetrode, or pentode biased to cut-off with a large cathode resistor. This means that the grid is so negative with respect to the cathode that little current flows through the tube.

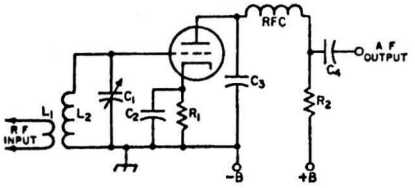
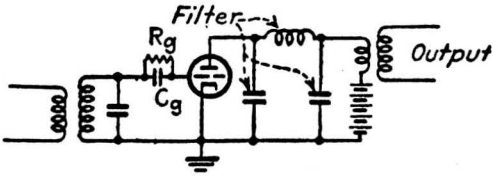


Plate Detector

The modulated RF signal is applied to the grid. When the signal drives the grid in the positive direction, current flows through the tube. When the signal drives the grid more negative, little change in plate current occurs because the grid is already so negative that the plate current is practically cut off. Thus, a process similar to rectification occurs in that RF current flowing in only one direction is effective in causing tube current to flow, the effect of the other half being suppressed. The amount of tube current that flows varies in accordance with the changes in amplitude of the incoming RF signal, and so the output of the tube is a copy of the original audio signal.

The plate detector has the advantage of sensitivity (since the tube amplifies the incoming RF signal), and it does not load the preceding circuit. It is not as tolerant to overloading as the diode detector and its distortion is somewhat higher. The plate detector was commonly used in sets of the late 1920's through approximately the mid-1930's.

Grid-Leak Detector: The grid-leak detector is a triode, tetrode, or pentode with no bias applied to the grid. In the grid is a resistor of high value (several megohms) bypassed by a small capacitor.



Grid-Leak Detector

Signals are applied to the resistor-capacitor combination connected to the grid, driving the grid alternately positive and negative. When the grid is driven positive, it draws current from the tube. The electrons cannot easily escape because of the resistor, and so they tend to remain on the grid, developing a slight negative bias voltage. If the

amplitude of the applied signal increases, it drives the grid more positive, causing the grid to draw more current, thereby increasing the negative bias. If the amplitude of the applied signal decreases, the grid does not draw current and the bias that has developed leaks off through the grid resistor. Thus, variations in the amplitude of the incoming signal develop a varying negative bias on the grid. The variations in the grid bias are a copy of the variations of the original audio signal. Since the plate current of the tube is governed by the voltage on the grid, the plate current also varies in accordance with the amplitude variations; i.e., it reproduces the original audio signal. The grid-leak detector thus acts similarly to a rectifier in that half the applied signal is reproduced to a greater extent than the other half. This is an imperfect kind of rectification but it is sufficient for detection. The inefficiency of rectification is compensated by the fact that, like the plate detector, the grid-leak detector also amplifies the incoming signal.

The grid-leak detector can also be understood as a combination diode detector directly coupled to an audio-frequency amplifier. The grid acts as the diode plate, and the rectifying action is exactly the same as in a diode. A negative DC voltage from the rectified current develops across the grid-leak resistor, biasing the grid negatively. The amplitude variations in the incoming signal causes the bias developed to vary similarly. The variations in voltage across the resistor are then amplified by the tube.

The grid-leak detector is the most sensitive type of detector. It has fairly low distortion but is easily overloaded by strong signals. It also loads the previous stage, reducing selectivity. In the early days of tube radios (ca. 1913-early 1920's) many sets consisted of a single tube operating as a grid-leak detector in a regenerative circuit, giving a simple, inexpensive receiver of high sensitivity and adequate selectivity.

Since detectors work best with signals of a certain strength, in most sets RF amplifiers usually precede the detector stage. For similar reasons, an audio amplifier stage usually follows the detector since the output from the detector is not sufficient to drive the output stage directly.

In the early days of radio (before about 1906), radio-frequency signals were generated by electrical currents jumping across a spark gap. This kind of electrical discharge caused the signals to be essentially amplitude-modulated, although in a very irregular fashion. It was impossible to modulate this kind of signal with an audio signal, and so communication was carried out by switching the signal on and off in Morse code

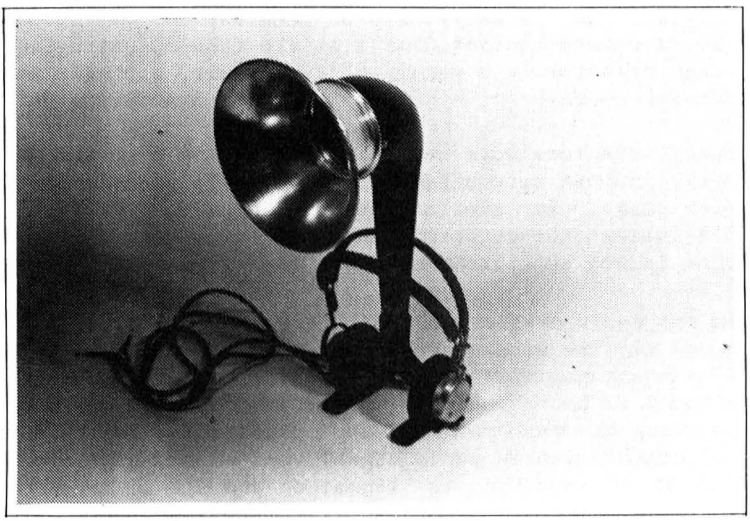
with a telegraph key. Detection of the signals proceded in the same way as explained above, except that earlier forms of detectors were used. The signals gave a characteristic growling, whining, or buzzing sound in the earphones, depending on the nature of the spark gap used. With some of the cruder transmitters and detectors, all one could hear was a click in the earphones each time the telegraph key was pressed. Only with the generation of smooth, continuous (undamped) radio-frequency signals was it possible to modulate them by sound and so be able to transmit speech and music with reasonable fidelity.

References:

The Radio Amateur's Handbook, publ. by the American Radio Relay League.
Radio Physics Course, by A. A. Ghirardi, 1933.
Fundamentals of Radio, by F.E. Terman, 1938

MYSTERY HORN SPEAKER

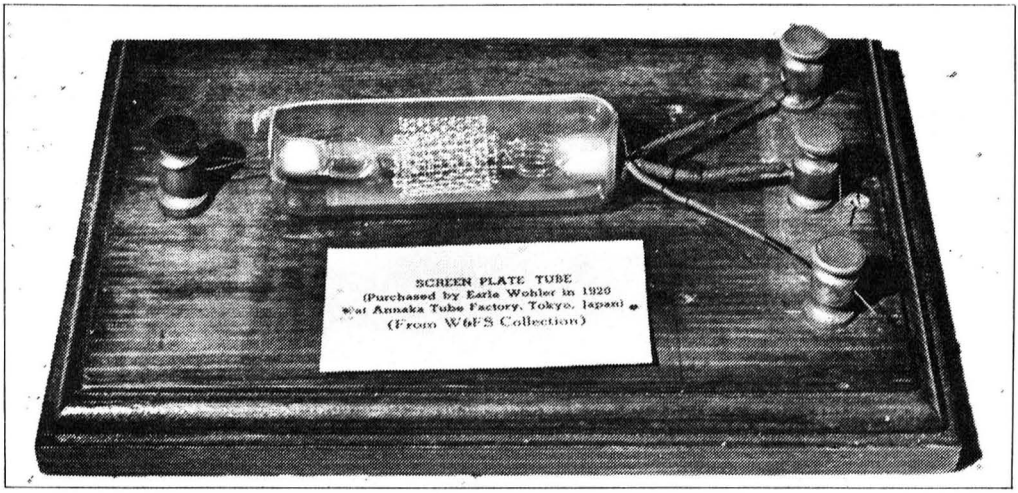
Can you identify the horn speaker shown below? Apparently manufactured around 1921-22, it is made of aluminum. The mouth is a separate piece made of polished spun aluminum which screws on to the neck. The neck is painted dark red inside and flat black outside. The horn was made to increase the audibility of headphones. The horn stands about 1½ feet tall and the bell is about 5" in diameter. If you have any information on this, write Jim Cirner, 720 Stendahl Ln., Cupertino, CA 95014.



ANNAKA VACUUM TUBE

The tube shown below is very similar to the Annaka AAB-5 triode described in Tyne's Saga of the Vacuum Tube. It is about 1" in diameter and 3" long. There are no markings on the glass. The wire leads are evidently for a double filament and plate and grid connections. The plate is made of a coarse mesh or screen. The label on the plaque says "Screen Plate Tube, purchased by Earle Wohler in 1920 at Annaka Tube Factory, Tokyo, Japan. From W6FS collection." The tube was probably manufactured around 1915-1920. If you have any information on this tube, write Jim Cirner, 720 Stendahl Ln., Cupertino, CA 95014.

Jim has a crystal set made by the Annaka Electrical Instrument Co., Tokyo, Japan. This set was used in the TV show "Hogan's Heroes." Recently, Paul Giganti found a similar set. It is pictured on the front cover of the May 1984 Journal of the Southern California Antique Radio Society.

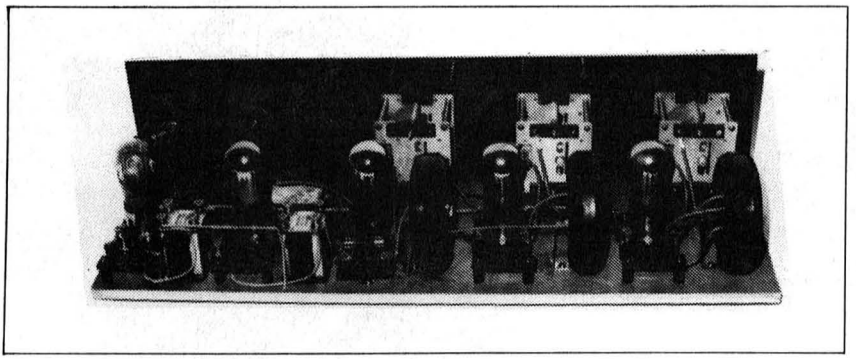


A CHRS SPECIAL

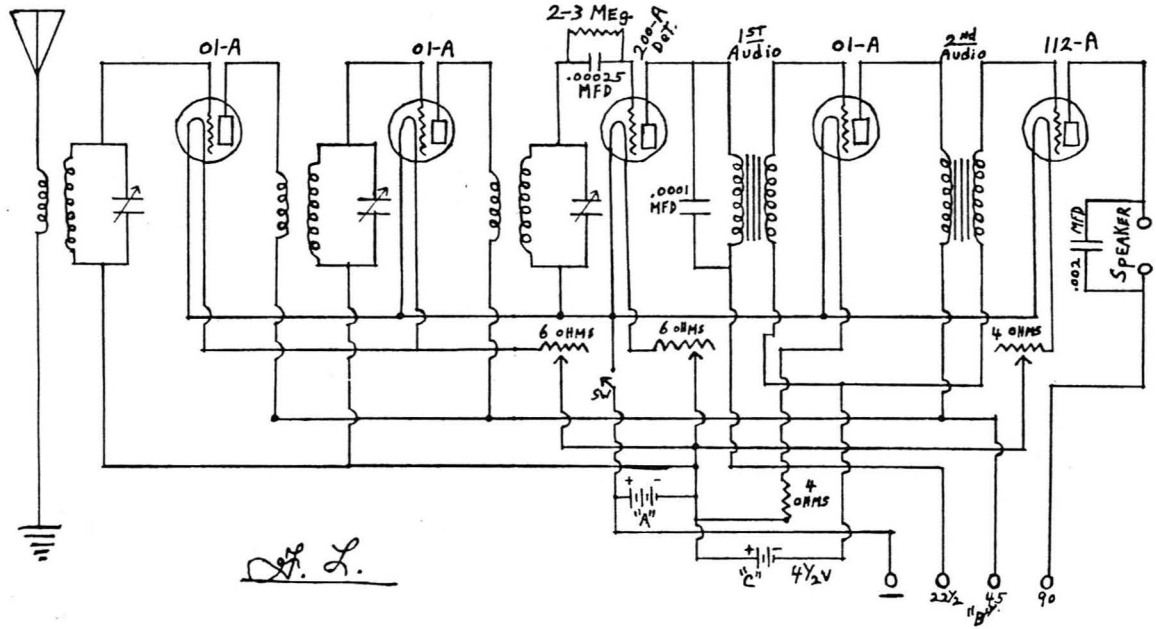
Remember the good old days when you built your own radios? Well, CHRS member Floyd Lyons has come up with a fine old battery set, using original parts to make it authentic. So get out the soldering iron, boys, and let's get to work!

PARTS LIST

3 Toroidal coils
3 National tuning condensers
3 4" tuning dials
5 Federal tube sockets, No. 16 V.T.
3 01A tubes
1 200A Det. tube
1 112A output tube
2 Thordarson audio transformers, 2:1 ratio
3 Rheostats (two 6 ohm and one 4 ohm)
3 Control knobs
1 Fixed resistance, 4 ohm
1 Yaxley filament switch
1 Yaxley phone jack
2 Bypass condensers (.0001 and .002 mfd)
1 Grid condenser (.00025 mfd)
1 Grid leak, 2-3 meg., plus mounting clip
10 Binding posts ("A", "B", "C", plus Ant., Gnd.)
Baseboard - 26" x 8" x ½"
Bakelite panel - 26" x 6½" x 3/16"



A C.H.R.S. Special



THE SOUNDS OF RADIO

by Jerry Perchesky

What is radio? A simple question...but is it really? We have tubes, capacitors, inductors, soldered connections, and other more complex mechanisms of which I have little knowledge. But what would all of these gimmicks and do-hickeys be without SOUND? The SOUND of radio! What we heard in the 30's and 40's created such vivid impressions in our imagination that radio has been called The Mirror of The Mind. The SOUND of radio...this has been my specific interest.

I have some 25,000 old-time radio shows, beginning in 1927 and running through those Golden Days of Radio into the early 50's, when radio as we knew it began to disappear forever. What joys I recall as a child sitting around our big Philco hearing Eddie Cantor, Inner Sanctum, Lux Radio Theater, Ed Wynn, Charlie and Edgar, Bing Crosby, Bob Hope (who failed in his first two attempts at network radio), Fibber and Molly (remember the closet?) and countless others bringing us laughter, music, and chills into our living rooms.

I guess my main thought now is sorrow--for those growing up today who missed those exciting days...all of that wonderful talent brought daily into our homes. And the MUSIC! Opera every Sunday! Live performances around the country heard at the very moment it was played! And the band remotes late in the evenings from Hotel Ballrooms - the Aragon, the Hollywood Palladium...the greatest band music and jazz heard every night. Fortunately, some people had the foresight not to destroy the original electrical transcriptions. I had the good fortune to become friends with many of the "greats" of that era. Bing Crosby gave me "carte blanche" to his personal collections at his home and his office in Hollywood. I copied each and every item he had. Some had labels torn off or worn from years of storage, and we had to guess at dates. Bing himself was unaware of the material he had. I called him up one morning to tell him I had a 1937 Kraft Music Hall show with him and John McCormack, the great Irish tenor. He couldn't recall ever meeting the artist, let alone working with him! He was amazed at the discovery! I have traded shows with other collectors around the world: London (BBC), a doctor in Puerto Rico, a professor in New York, etc. And it never fails to amaze me how much material is there....if you take the time to seek it out.

Back to SOUNDS. What would that box be without the SOUNDS....the talent of performers, writers and musicians,

producers and directors. And don't ever forget the SOUND MAN! What glories he added to our vivid imaginations! The point is, while you collect those radios and their parts, don't forget those masters who provided all of those sounds....those WONDERFUL SOUNDS that made that little box the marvel that it was.

For information on purchase of radio shows, write:

Jerry Perchesky, Original Radio
P.O. Box 23088, San Jose, CA 95153

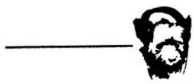
PLAYING OLD LOUDSPEAKERS

Do you have an old horn or large-cone armature-type speaker that you would like to hear playing? Try this: take a transistor radio with a plug-in earphone. Cut off the earphone. Connect the wires from the earphone to the secondary wires of an output transformer (these wires originally went to the speaker). Connect the primary wires of the output transformer to the speaker (the primary wires originally went to the radio chassis). The output transformer is necessary to match the transistor radio to the impedance of the old loudspeaker (usually about 2000 ohms).

Plug in the earphone and turn on the transistor radio. If the speaker is good, it will play. This set-up also makes a good testing device for old speakers. Output transformers are readily obtained from junk sets, especially AC-DC table radios. A small filament transformer will also probably work.

- - -

A replacement cone for the old magnetic armature speakers can be made easily. Obtain a sheet of stiff, light paper. With a drawing compass (available at any 5-and10¢ or stationery store) draw a large circle. Draw a line from the center of the circle to the edge. Cut out the circle and cut along the line to the center. Overlap the edges to make a cone that will fit on the speaker. Hold the edges with a paper clip and glue the seam. Color the paper with wood stain to make it look old.



MODULATION AND DETECTION

(ADVANCED VERSION)

The explanations of modulation and detection that are usually given in textbooks tend to gloss over the following points: (1) the modulated RF signal applied to a detector has no audio frequency component. How can one get audio from such a signal if no audio exists in the signal itself? (2) how does rectification (or its equivalent) result in recovery of audio from a modulated RF signal? To understand these questions, it is necessary to understand the principle of heterodyning.

Heterodyning: If one passes signals of different frequencies simultaneously through a linear device (one whose output is exactly proportional to its input), the output will contain only signals of the same frequencies as in the input. If the mixture of signals is passed through a non-linear device (one whose output is not exactly proportional to the input), new signals will appear, the frequencies of which are the sum and difference of the input frequencies. The appearance of new frequencies when different signals are mixed in non-linear devices is known as heterodyning. For example, if we take an audio tone of 1000 Hz and a radio-frequency signal of 1,000,000 Hz and pass these through a non-linear device, we will get in the output signals of 1,000,000 + 1000 or 1,001,000 Hz and 1,000,000 - 1000 or 999,000 Hz. If the audio tone is of a different frequency, say 2000 Hz, the new frequencies are 1,002,000 Hz and 998,000 Hz. As the frequency of the audio tone changes, the frequency of the side frequencies changes accordingly. Also, if the amplitude (loudness) of the audio signal is changed, the amplitude of the side frequencies changes, in proportion to the amplitude of the audio signal. The amplitude of the 1,000,000 Hz radio-frequency signal itself (the "carrier") does not change with variations in the audio signal. However, the composite of unmodulated carrier and sideband frequencies is seen as an amplitude-modulated RF signal.

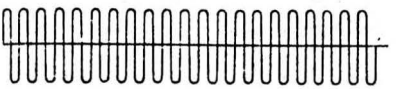
AM Modulation: In AM transmission the principle of heterodyning is used to impress audio signals (speech, music, etc.) on an RF signal to generate an amplitude-modulated radio-frequency signal that carries the audio information. As we have seen, this signal is actually a composite, containing the unchanged unmodulated RF signal and sidebands of frequency close to that of the RF signal, containing the audio information. The band of frequencies created are all radio frequencies similar to that of the carrier and so can be radiated

effectively by an antenna. Note that there is no signal of audio frequency in this composite.

Detection: Detection in radios also involves heterodyning. The modulated RF signal is passed through a detector, which is essentially a non-linear device. In the detector the different radio-frequency components of the modulated radio signal (sidebands and carrier) interact (heterodyne), producing new frequencies. One of those produced is a duplicate of the original audio signal. For example, in a 1,000,000 Hz radio signal modulated by a 1000 Hz audio signal, the sideband frequencies of 1,001,000 Hz and 999,000 Hz heterodyne with the 1,000,000 Hz carrier frequency to produce the original 1000 Hz audio signal (1,001,000 - 1,000,000 Hz or 1,000,000-999,000 Hz both give the 1000 Hz audio signal). Note that any device that is non-linear will act as a detector. This explains the effectiveness of many of the earlier devices that were used as detectors in the early days of radio.

Single Sideband (SSB): In a special technique applied to AM transmission, the amplitude-modulated signal is treated so that the carrier component (which itself carries no audio information) and one sideband are removed. The remaining sideband (which, remember, is of radio frequency) is radiated by the antenna. In the receiver a special local oscillator supplies the original RF carrier component necessary for the sideband to heterodyne with in order to regenerate the audio signal. This technique of broadcasting is called "Single Sideband" or SSB and is commonly used by radio amateurs today for communication. If your old radio can get the shortwave amateur bands, you can hear these transmissions. They will sound like ordinary speech greatly distorted by a Donald Duck quacking-type sound because the old radios do not have the oscillator needed to restore the audio correctly.

Heterodyning and Hi-Fi: The principle of heterodyning is employed to determine the linearity of high-fidelity amplifiers. A mixture of two audio frequencies (60 and 4000 Hz) is passed through the amplifier, and the output is analyzed for the appearance of new frequencies. If the amplifier is perfectly linear (high-fidelity operation), no new frequencies are created. If the amplifier is not perfectly linear, new frequencies appear by heterodyning of the two input signals. The presence of these new frequencies is called "intermodulation distortion" or IM.



SOLDERING HINTS

by H. Brams

Materials needed:

Soldering irons - 25 watt pencil type or gun, 80-100 watt iron
Rosin core solder
Soldering aid or similar pointed tool
Solder sucker or solder wick
Small electric fan

You should already have some knowledge of, or practice in, proper soldering techniques.

——Mount a small fan near your workbench to blow the solder fumes away from your face.
——If your iron has a removable or screw-in tip, loosen and tighten it several times before using the iron each time to prevent the tip from seizing.
——Surfaces to be soldered should be clean, preferably with a shiny surface. Use a small wire brush or fine sandpaper for cleaning.
——Heat the parts to be soldered with the iron so that the solder melts on the parts, not on the iron.
——When the molten solder has flowed on the parts, dab or tap the iron on the joint to help spread the solder.
——Allow sufficient time for the molten solder to solidify. The shiny appearance of the molten solder will turn slightly dull. However, the interior of the joint may still be liquid so wait an additional 15-30 seconds for the entire joint to solidify.
——If you are in doubt that the parts have been soldered together securely, wiggle the wires to see if they move.
——To remove excess solder, melt the solder and remove it with a solder sucker or soak it up with solder wick. Alternatively, pinch the glob of molten solder with needle-nose pliers and lift it off (I find this method is very fast and efficient).
——To solder components to a metal chassis directly, first rub the chassis with sandpaper to remove all dirt and oxidation until you are down to bright clean metal. Use a heavy-duty soldering iron (80-100 watts). Terminal strips can be mounted quickly and easily by soldering them directly to the chassis, and the outside appearance of the chassis is not changed.
——Mount capacitors and other components with identifying markings in full view so that it is easy to identify and locate them.
——The covering on modern capacitors may be very thin. Take care not to burn these components with the iron.

——Wires going to a terminal should run through the hole (or around the terminal, if there is no hole), turned back once in a "J" turn, and pinched tight. Avoid winding wires around a terminal several times; this makes them difficult to remove.
——Where many wires are to be connected to a terminal, the wires least likely to be changed or removed should be at the bottom. Wires most likely to be changes should be on top--i.e. in the most accessible location. This arrangement makes it easy to remove components that may fail at a later date. If there are several holes in the terminal, run leads from components most likely to fail (e.g. electrolytic capacitors) through a separate hole so that they can be removed easily without disturbing the other wires.
——To attach a wire to a terminal closed by solder, heat the terminal to melt the solder and use a soldering tool or similar pointed instrument to make a hole.
——Wires running to electrolytic capacitor cans: since these cans are likely to be replaced at a later date, avoid connecting many wires to the terminals. Instead, run the wires to a nearby terminal strip, then run one wire from the strip to the can. Leave extra length in wires running to the cans; constant soldering and desoldering may break the wire and you will need the additional length.
——If a large component (e.g. electrolytic capacitor or metal strip resistor) has failed, it is not necessary to remove it. Solder a terminal lug foot on it and connect the new components to the terminal lug.
——To remove wires, heat the terminal, unwind the end of the wire, and pull the wire out. If the end of the wire has been wrapped around the terminal several times, it may be difficult to unwind. In this case, push the wire through the terminal to form a small loop, then insert a pointed instrument to widen the loop and to loosen the wire. In stubborn cases, cut the loop, remove the wire, and then remove the cut-off piece. Alternately, simply cut the wire where it bends around the terminal. For those cases where the wire cannot be removed from the terminal without a great deal of trouble or where there is danger of breaking the component it is attached to, cut the wire about an inch from the terminal and make connection to the end of the cut wire.
——To make sure that a new replacement part is attached to the same points as the old one, try this: put the replacement part close at hand. Cut the old component out, leaving a length of the old wires running to their respective connection points. These will indicate clearly where the new component is to be connected. Remove one of the old leads and solder one lead of the new component in place. Then remove the other old lead and solder the remaining lead of the new component in place. In this way, one will not forget where the original part was connected.

ADVERTISEMENTS

For Sale: Battery eliminators for those old sets you'd like to hear play. 1.4 to 6V, adjustable and regulated for up to 1.25 amps. Three plate voltages plus an adjustable C bias voltage. Available with or without a case. Send a SASE for more information. Now available - a very nice reproduction of the instruction sheet in the lid of your Aeriola Sr. receiver. $3.00 plus 75¢ handling per order. Also, tuning dials for Philco radios models 33B, 84B, 93B, or 37-84, $7.50 each, postpaid. Peter Yanczer, 835 Bricken Pl., St. Louis, MO 63122.

For Sale: Twenty beautiful AM clock radios, "as is" condition. Send SASE for list. Russ Goodlive, 1401 Franchere Pl., Sunnyvale, CA 94087.

For Sale: Emerson U-5A white plastic radio in excellent playing condition. See Flick of the Switch, p. 82 for photo. $50. Ray Miller, Box 1711, Oceanside, CA 92054 (619) 757-5976.

Wanted: Grandfather clock radio, Philco 70 or 71, or Crosley 124 Playtime. Gilbert D. Orozco, 33642 15th St., Union City, CA 94587 (415) 471-6178.

For Sale: Rider's manuals, Vols. 6, 8, 13, and 15 plus a few indexes. Solid-state broadcasters to play your old radio programs on cassettes or records through your old radio, $10 postpaid. Many old tubes, both new and used. Send SASE for list. Information on custom power supplies - send make and model for price quote, along with SASE. Many other parts available too.
Wanted: Rider's manual Vol. 23, power transformer for Radiola 60, any mirror glass radio or grandfather clock radio in restorable condition. Stan Lopes, 1201-74 Monument Blvd. Concord, CA 94520 (415) 825-6865.

For Sale: Two General Radio condensers, 500 mmfd, $6.00 each. Raytheon BA rectifier, 350 ma, new in carton, $6.50. Shipping costs extra. Wanted: Samson neutralizing condensers. 1N34A germanium crystal diode, has crystal feeler symbol engraved on oversized glass bead. Carter and Yaxley rheostats, ranging from 10, 15, 20, 25 or 30 ohms. Floyd Lyons, 754 Post St., #203, San Francisco, CA 94109 (415) 885-1028.

For Sale: Philco "Beam of Light" automatic record changers, vintage 1940-42, $10.00 each. 1940 Philco fabric-covered portable radio-phono combination (battery -powered radio with wind-up phonograph) $60, unrestored. 1955 Saba "Freiburg" AM/FM/SW table radio, power transformer needs replacing, set has dual 10" speakers, push-pull output and is the "Rolls-

Royce of German Radio," $50. Wanted: 18" Jensen theater speaker, electrodynamic, model L-18 or equivalent. Jensen "Q" series pedestal horn tweeters, electrodynamic only.

Capehart automatic flip-over record changers. General Industries record changers, ca. 1935-1940. Garrard RC-6 record changer and similar models ca. 1935-1940. Anything pertaining to E.H. Scott or McMurdo-Silver radios from 1931 to 1938. John D. Eckland, 969 Addison Ave., Palo Alto, CA 94301 (415) 323-0101.

For Sale: Rider's manuals Vol. 1-20 (1-5 abridged) $125. Will trade gorgeous cathedral radios for exciting Zenith radios not already in my collection. Alan Eaton, 7092 Via Quito, Pleasanton, CA 94566 (415) 462-1390.

Wanted: Western Electric amplifiers, mixers, drivers, horns, tubes, fans, washing machines, vacuum cleaners, sewing machines, (and anything else that has a name on it) to fill a void in the Far East. Don Pettee, Eldorado Park, 600 E. Weddel #99, Sunnyvale, CA 94086.

Wanted: Any novelty sets of the 1930's-1940's. Ken Zander, P.O. Box 2652, Sunnyvale, CA 94087 (408) 286-1104.

Wanted: Midwest radios of the 1930's-1940's. The uglier they are, the more I like them. Mike Simpson, 1515 Floyd Ave., Sunnyvale, CA 94087 (408) 733-6069.

Wanted: Old car radios, 1930-1959. Charles Siegfried, 659 Cherry St., Santa Rosa, CA 95404.

Wanted: McMurdo-Silver Masterpieces 5 or 6 on a Clifton cabinet. R.J. Crockett, 1520 Willow Rd., #202, Palo Alto, CA 94304 (415) 324-8235.

For Sale: Kennedy console, electric, 1930, good condition, $125. Westinghouse RC, good condition $125. Grebe CR-9, good condition, $350. Ericcson Swedish radio, electric, mid-1930's $250. Paul Giganti, 2429 San Carlos Ave., San Carlos, CA 94070 (415) 593-4723.

For Sale: Riders manuals, Vol. 1-16 (separate volumes) good condition $150. Russ Goodlive, 1401 Franchere Pl., Sunnyvale, CA 94087 (408) 732-1472.

For Sale: RME communications receiver model 69, 1936 vintage, excellent condition. Write for price. Clough-Brengle RF sweep generator, vintage 1937, $35. Small National receiver in good working order, $65. Wanted: Any mint Zenith radios and Zenith literature, pre-1940. Pre-war new old-stock tubes. Robert Urban, 55 Hawthorne Ave., Los Altos, CA 94022 (415) 948-2815.

For Sale: Atwater Kent model 70 TRF floor model radio (1930). Restored condition. $200. Wanted: Macintosh or Marantz tube preamps and amps, Ampex AM-10 tube mixer. Rich Links, 30 Walnut St., San Francisco, CA 94118. (415) 567-9245, (Lv message).

For Sale: Fisher X1000 tube integrated amp, $200. Fisher 400C preamp, $100. 1936 Silvertone floor model radio with large gold dial, $80. Ralph Eckland, 4227 Suzanne Dr., Palo Alto, CA 94306 (415) 493-5303.

For Sale: 1927 Freshman Masterpiece AC console in original working condition, model K60-S, $125. 1928 Sonora AC console model A-30, working, $95. Philco 39-116 remote-controlled console with Mystery control included, black lacquer cabinet, $175. Philco 41-285 console in excellent working condition, $65. Stromberg-Carlson consoles: model 1121 (1946) AM-FM, $95 and model 420L (1935) $75. Magnavox Imperial (Drexel cabinet) 1946, African mahogany, excellent condition, $125. 1947 RCA 9" TV (model 8-TR29), working, $75. 1950 Zenith TV console (model G2438R), red mahogany cabinet in excellent condition, $75. Wanted: Chassis for 1934 Atwater Kent radio model 325E, has five tubes and airplane dial. Wood tone control knob for 1938 motorized Zenith radio, 1204 chassis. Volume and tuning knobs and six hook-type white plastic buttons for 1939 Zenith chairside radio. Bob Malin, 1825 Via El Capitan, San Jose, CA 95124 (408) 267-1396.

For Sale: H.H. Scott 121B and 121C preamps, $30 and $40 respectively. Pair of Empire 208 turntables $40 per pair. Art Deco Jensen speaker cabinet, 1940's vintage $25. Wanted: Rare, unusual, and exotic microphones and any associated parts and literature, high quality studio turntables e.g. Thorens, EMT, etc. Norm Berge, 969 Addison Ave., Palo Alto, CA 94301 (415) 323-0101.

For Sale: All kinds of duplicate television sets from my collection of over 200 pre-1950 sets. Send SASE for list of sets with prices. Wanted: Pre-war TV's and sales brochures. Jerry Grulkey, P.O. Box 4193, Vallejo, CA 94590.

Wanted: QST magazines for the year 1920 in good condition with covers. D.H. Brodie, 315 Cotton St., Menlo Park, CA 94025.

Wanted: Hallicrafters model DD-1 Dual Diversity receiver, 1938 vintage, preferably with walnut speaker cabinet model DD-1CS. Peter Brickey, c/o CHRS, P.O. Box 1147, Mountain View, CA 94042-1147.

For Sale: RCA Art Deco tombstone radio with airplane dial, fully restored, $150. Unusual tombstone radio, restored, $100. Stromberg-Carlson corner-type console, very unusual, unrestored,

$145 or best offer. Wanted: high voltage apparatus and X-ray equipment, pre-1930. Pete Griffen, P.O. Box 403, San Rafael, CA 94902.

Wanted: Complete set of knobs for a Philco 116X radio. Knobs are black plastic, hexagon-shaped, three regular knobs and two dual-concentric tuning knobs. Also want 175 kc output IF, compact type, 2" high, with dual secondary, for a Majestic 570 Tune-O-Matic programmable clock radio (1934). Elmer Hooker, 39687 Iolani Ct., Fremont, CA 94538 (415) 656-4490.

Wanted: Unusual magnetic loudspeakers of the 1920's. George Durfey, 912 La Mesa Dr., Menlo Park, CA 94025 (415) 854-4041.

Wanted: Avid collector seeks mirror glass radios, any condition. All replies answered. Ed Sage, 1781 Helane Ct., Benicia, CA 94510 (707) 746-5659,

Wanted: Power transformer for Chevrolet car radio, 6V, 1941-1950 vintage. Any 6V vibrator transformer may work as a substitute provided the set had six or more tubes and one output tube. Robert Stueland, 21711 Alcazar Ave., Cupertino, CA 95014 (408) 253-8848.

Wanted: Black plastic hexagonal knob for Philco 89 cathedral radio, approx. 1" diameter. Also, two knobs for a Pilot 63B. Mark Thompson, 36 Cranston St., Torbay, Auckland, New Zealand.

For Sale: Zenith floor model radio, 1940 vintage, 10-tube chassis, fair condition $75. Nice Zenith wood table radio, gold dial, white square pushbuttons, good condition, works, $85. Steve Franaczek (415) 841-9323.

For Sale: E.H. Scott 800B AM/FM/SW motorized radio-phono in blond cabinet, good condition, works. Philco floor model 37-670 good condition, works, $250. Philco 16B cathedral radio, works well, $250. Many smaller wood and plastic radios, all restored and in good condition. Also, many choice and unusual items from the 1920's-1950's. Michael or Suzanne, 5295 College Ave., Oakland, CA 94618 (415) 652-4333.

For Sale: Atwater Kent model 75-P radio-phono, $275. Atwater Kent model 55 in Kiel table, mint, $325. RCA Radiola 60 radio, mint, $150. RCA model 106 speaker with tapestry front, exc. cond. $175. Philco model 96 floor model radio (1930), exc. cond. $175. Westinghouse model WR-28 tombstone radio, $90. Majestic model 174 tombstone radio with chrome speaker grill, unusual styling, Tune-O-Matic feature (motor is missing), restored, $225. Jon Lundberg, 2126 Dwight Way, Berkeley, CA 94704 (415) 848-6519.

For Sale: Webster-Chicago recording head No. 2904 for Electronic Memory wire recorder, $7.00. 1L6 tubes for Zenith Transoceanic radios, $6. Philco 16 chassis, $20. Very rusty chassis for Sonora 73-S cathedral radio, $25. Ballast tubes, $4.00. VTVM with leads and instruction manual, $10.
Wanted: Tube shield that fits over three tubes in Philco model 51 radio, grid dip meter that covers AM broadcast band and below. Herb Brams, 2427 Durant #4, Berkeley, CA 94704 (415) 841-5396.

- - - -

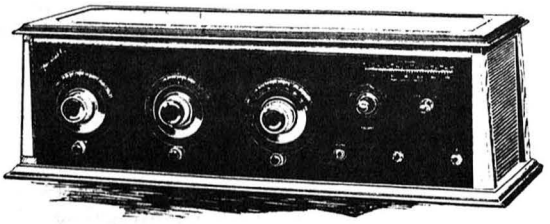
The Editor would welcome an article on the history of early detectors: what devices were used, how they operated, how well they worked, etc.

ARIZONA ANTIQUE RADIO CLUB

SCHEDULE OF EVENTS

April 28 - Annual Meeting & Swap
May 16 - Lecture & Slide Show
June 20 - Restoration Workshop
September 28 - Swap Meet
October 17 - Video Tape of AWA Museum
November 21 - Lecture
December 19 - Dinner Dance Party

For more information call or write Lee Sharpe, 2224 W. Desert Cove Rd. #205, Phoenix, AZ 85029 (602) 861-1388.



HUMOR

I'm a radio repairman - let me remove your shorts.

Twixt optimist and pessimist
The difference is droll,
The optimist sees the doughnut
The pessimist sees the hole.

Woman was created from the rib of man.
She was not made from his head to top him,
Nor out of his feet to be trampled upon.
But out of his side to be equal to him,
Under his arm to be protected,
And near his heart to be loved.

Some popular fraternities:

I Tappa Keg
I Phelta Thi

GRAND OPERA !

Catalog Number Four contains Marvelous article on tuning Receiving Sets Ten cents brings it to you

There is a nightly performance of Grand Opera. Let Tuska Reliable Radio take you, together with home comforts.

Tuska Quality Radio Apparatus is reliable in service, moderate in price.

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