

THE NEWSPAPER FOR  
THE HOBBYIST OF VINTAGE  
ELECTRONICS AND SOUND

# THE HORN SPEAKER

## FIND OF THE MONTH

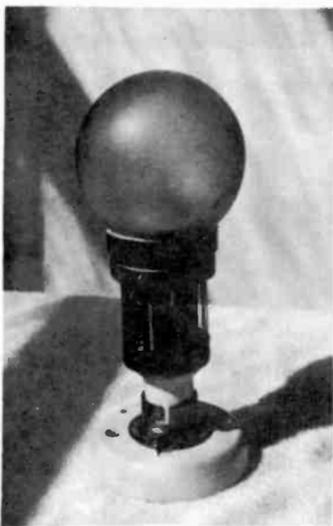
### GLOW LAMP

NERNST GLOWER

By Floyd Lyons

In 1897 Dr. Walter Nernst of Göttingen, Germany, invented a new type of lamp. He had been intrigued with the Rare Earths used by Welsbach in his famous gas mantles which permitted them to be burned in open atmosphere and still not be consumed. Nernst came up with an innovation of his own—a non-combustible electric glower that did not have to be enclosed in a vacuum. Lane-Fox and Edison had suggested just such an illuminant but Dr. Nernst was the first to pursue this subject to its commercially successful conclusion.

The accompanying schematic shows the four main elements of this lamp: heater, glower, ballast and electro-magnet. The heater coil is made of fine platinum wire wound on a thin porcelain tube and imbedded in cement to protect it from the intense heat of the glower when the latter becomes white hot. The principal ingredient of the glower was zirconia, which is a non-conductor when cold, and pro-



1/4 ampere Nernst Glower

gressively decreases in resistance as it becomes hotter. The ballast consists of an iron wire coil sealed in a bulb filled with hydrogen gas. Iron has the property of increasing in resistance when current increases, thereby off-setting the decreasing of resistance of the glower when it becomes hot. This setup can maintain a constant current through a

40 volt fluctuation. The electro-magnet is of the common garden variety.

Starting at the input, current first flows through the heater circuit. Remember, the glower is a non-conductor until hot. The heater is placed near the glower—when the temperature is raised to approximately 700 C. (1300 F.), current begins to also flow through the glower. As the current builds



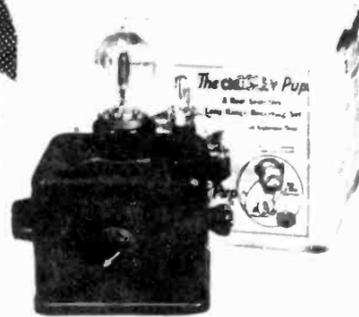
1/2 ampere Nernst Glower

up in the glower circuit, the magnet is actuated, attracting the armature and breaking the heater circuit. To prevent the glower from becoming overheated in its own circuit, a compensating or steadying ballast must be replaced in series with it. This is the iron wire ballast described above.

When the power is turned off, the armature, working by gravity, drops and closes the heater circuit, thereby completing the cycle. The lamp is then in readiness for relighting.

The schematic and lamp described above is known as the automatic type. The non-automatic came without a heater and had to be set in motion by a match, or some external source of heat. The number of glowers incorporated in one lamp varied from one to six, although a 30-glower lamp was also made. In the multiple type, there was one ballast for each glower, but a doubling up on heaters was common. Six glowers may have only four heaters, for instance.

Continued on page 2



By Alan W. Diaz

While browsing through a junk shop during my lunch hour I came across a bushel basket of old tin boxes and dirty bottles. Sticking up through the junk I spotted what appeared to be an old fuse box. No, on second inspection, it looked more like a tube socket.

Not yet excited, I lifted the little box from among the junk. On the bottom was that old tell-tale label that stated "for amateur and experimental use only".

Being new at this game, the name Powel Crosley Jr., had no particular meaning to me until I got home and looked it up. What I had was a 1923 Crosley "Pup".

Back at the junk shop, I was inquiring as to the price of the relic. The elderly man looked it over and not recognizing any significant difference between it and the rest of the junk, replied 50¢.

I paid the 50¢ and he took me outside to where the garbage cans were. He opened the lid and peered inside. Then he looked at me and said "I guess the trash man already picked it up, I had seven more of those things this morning but I threw them out."

I've been back to that place several times hoping the old man was mistaken about his loss, but apparently the other seven Crosley Pups have taken their place in nature like the fate of many radios. I'm thankful that I was able to recover the one set.

Alan W. Diaz  
24 Mars Ave.  
Warwick, R. I. 02889

released the frog. A few minutes later, while still hunting, he felt something tapping his shoe. Looking down, he saw the same snake with another frog in its mouth.

On a fishing trip, he and his buddy were captured by some mosquitos. "Shall we eat them here or take them home with us," one of the insects asked.

"Let's eat them here," replied another. "If we take them home, the big mosquitos will get them."

During a baseball game, spectators wondered why all the players were crying until they learned that an onion was being used for the baseball.

Bob once told the radio audience that the level of table manners had risen back in Van Buren. "Now folks lick off their knife before they stick it in the butter dish."

In the October 10, 1936, edition of "Radio Guide", a portion of a story about stars' relatives was devoted to Bob:

Bob—So you believe in the truth, do you, Bob?

Bob—Certainly do, Bing. I always said the truth was man's snake's mouth. The reptile in turn

Continued on page 2

### RADIO BAZOOKA

BOB BURNS, RADIO COMEDIAN

By Ray Poindexter

From the length of galvanized pipe with a funnel on one end came a low-pitched, bass tone not unlike the voice of its player when he told tall tales of hillbilly humor. It was Bob Burns on the radio blowing the instrument he called the bazooka. His other airwaves feature was that of relating in his mountain drawl the experiences of his kinfolks back in his hometown of Van Buren (When he said it, the last word rhymed with "yearn"), Arkansas. Most of the people he mentioned were mythical; but some were real citizens of the sleepy hamlet on the Arkansas River in Crawford County at the state's western border. Such names as Aunt Bee, Uncle Fud, and Grandpa Snazzy were fictitious, but many lis-



Bob Burns and Bing Crosby on the "Kraft Music Hall"

teners back home thought they recognized their live counterparts. The humorous situations Bob talked about were mostly an outgrowth of his boyhood experiences. Also, some local townspeople supplied him with up-to-date material after he became famous on the radio and in movies.

His first national recognition came when he appeared on crooner Rudy Vallee's radio show in New York in 1935. His country style was a sharp contrast to the show's star—a college type that sang into a megaphone and insisted in song that "My time is your time."

Burn's initial radio success led to his becoming a member of Bing Crosby's "Kraft Music Hall" in 1936. The program was heard over

NBC each Thursday night at 9:00 o'clock CST. Crosby was by then an established Hollywood star, having first gained show business success as one of the Rhythm Boys with Paul Whiteman's Orchestra in 1927.

William Robert Burn (Bob added the 's' later) was born in 1896 at Greenwood, Arkansas, some twenty-five miles south of Van Buren. His mother ran a hotel, and his father was a civil engineer. After moving to Van Buren, Bob learned to play the mandolin; and his brother, two years older, played the guitar. One day some traveling musicians came to town. One member played a long piece of iron pipe and made it sound like a kazoo. This interested Bob. He took a piece of pipe from a horizontal bar in the backyard and tried to play it. His efforts resulted in only one note. The experiment didn't end with that. Next he bought a pipe about three feet in length and attached a funnel to one end. With that arrangement he was able to play an octave. He called the instrument a "gas-pipe" at that time. (In a movie, he once referred to it as "two pieces of pipe and an old whiskey funnel.")

Both brothers went to Chicago to work prior to World War I. Bob made eight dollars per week. When the U. S. entered the conflict, Bob decided to enlist. Across the street from where the boys stayed, there was an electric sign on the plant where the eye medicine Murine was made. Bob came to the room one day after joining the Marine Corps and said, "I'm a Murine".

After the war he bummed around, worked at odd jobs, and performed in vaudeville. Will Rogers, from the neighboring state of Oklahoma, is credited with advising him to talk about Arkansas folk. This, along with his bazooka, led to his great success. His stories were many and varied. One was about the time he was out hunting and saw a snake with a live frog in its mouth. He took a bottle of whiskey out of his pocket and pouted some of the liquid into the snake's mouth. The reptile in turn



Left to right: Bob Burns with his bazooka, ventriloquist Tommy Riggs, Charlie McCarthy, Edgar Bergen, Rudy Vallee, and Joe Penner with his duck.

# RADIO EXHIBIT



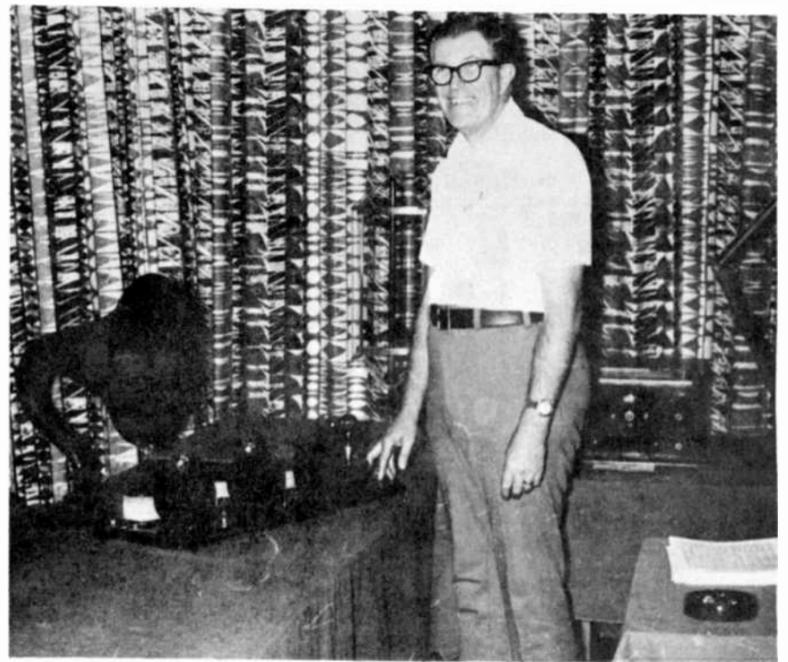
Mrs. Bob Lane visits the radio exhibit at the Nostalgia Convention in Dallas during July 11-14. Clarence Johnson, a collector of rare phonographs and radios, shows his sets to her.



Clarence Johnson, the proud owner of a DeForest D-10.



J. W. F. Puett points out some features of Scott and McMurdo Silver radios.



Walt Jackson, W5ZYA, with Walts Emporium just acquired the "AK" breadboard in a trade with Bob Lane of Kansas.

## LETTERS

### EDITOR'S MAILBAG

Union Carbide Corp.  
Consumer Products Div.  
99 Kinderkanack Rd.  
Westwood, N. J. 07675  
Gentlemen:

We recently acquired an antique radio (TONODYNE) which had three Eveready batteries in it. The radio had been in dry storage in an attic for many years.

Two of the batteries are Eveready # 771—each are 4-1/2 V C batteries. One of these C batteries is stamped "for best results put in service before June 1928", and the other is stamped "for best results put in service before July 1928". The reading on each of these 4-1/2 V batteries is 4.1 V. Measured today with a VTVM.

The third battery is a #768 B or C battery with voltages of 4-1/2, 22-1/2 and 16-1/2. The 4-1/2 V terminals measure 4V, and the 22-1/2 V terminals measure 20V, and the 16-1/2 V terminals measure 15V. Stamped on this battery is "for best results put in service before April 1928".

If we can find a full complement of tubes for this radio we will power it with this set of batteries.

We thought this might be of interest to you.

Sincerely,  
Lee A. Davis  
Route 3, Box 2203  
Sumner, Wash. 98390  
May 9, 1974

Dear Mr. Cranshaw:

This is a copy of a letter we sent to Union Carbide, which we thought might also interest you.

Sincerely,  
Lee A. Davis

Dear Mr. Cranshaw:

I have been searching for a cross-reference list for military receiving tubes and common receiving tubes. For example, the military tube VT-67 tube replaces the common # 30 tube. So far I have not been able to obtain such a cross-reference. I would appreciate your help! I also subscribe to your newspaper and enjoy it very much.

Sincerely yours,  
Bruce Harbeck  
P. O. Box 1172  
Sioux City, Iowa 51102

Hi Jim:

I started in radio about 1920. I never heard of SW in 1923 or police calls.

Smitty, W3BNO

ANTIQUE RADIO—50 Yrs. old. Reas. Exc. cond. Floor model. short wave & police calls.  
ANTIQUE—Mirror frames & milk cans. Beautifully restored & decorated.

### ELECTRIC LIGHT

For power, 220 volts was used on all multiple-glowers, but either 11 V or 220 V could be used on the single. Alternating current was recommended, although it would also work on direct current. The latter shortened the life of the glower by as much as one half. This was due to electrolytic action. A black deposit formed on the negative and extended gradually to the positive end. As the deposit increased the candle power and efficiency decreased. This problem did not exist with A C power.

Efficiency favored the Nernst Glower over the ordinary carbon lamp of equal intensity (one glower equal to approximately 16 C.P.). The initial efficiency of the glower was five lumens per watt as opposed to 3.4 for the carbon lamp. The former required about 88 watts per glower as compared to

175 watts for the carbon lamp. Another asset of our subject lamp was the daylight quality of its light. It gave off a dazzling white light, which necessitated some form of a milk-glass globe to surround the complete unit.

The Nernst Glower appeared on the American market in 1900 with distribution and patent rights assigned to the Westinghouse Co. of Philadelphia. The lamp disappeared in about 1912 and one of the reasons for its downfall was a new lamp known as The Meridian. This was the usual vacuum type bulb, but made tipless to make it more decorative, and in particular to compete with the Nernst Lamp. And it was cheaper to operate.

With the advent of Tungsten Lamps and that ever present competitor, "progress", both fell by the wayside. For twelve years, though, many city streets, galleries, stores and homes were lit by Nernst Glowlers.

Floyd Lyons  
456 Post Street  
San Francisco, Calif. 94102

REFERENCES:  
*History of Electric Light* - Henry Schroeder-1923  
*Electricity in Everyday Life* Edwin J. Houston 1904  
*Hawkins Electrical Guide # 8* - Hawkins & Staff- 1917  
*History of Incandescent Lamp* Howell & Schroeder 1927

### BOB BURNS...MORE....

best friend. Too bad my Uncle Si didn't stick closer to the truth. He was a champion liar and it was his ambition to be the champion hog-caller of Crawford County. He went all over the country calling hogs—he could call more hogs than all the other hog callers put together, but when he wanted

to call his own hogs they wouldn't come. He was such a liar his own hogs wouldn't believe him.

When Bob is talking about his relatives, his favorite subject is uncles—he has five of them, and although he seldom uses their names in the scripts, their characteristics are easily recognized by the natives of Crawford County. Consequently, Bob and his uncles are generally on the "outs". However, when they become too indignant, Bob merely switches to some other unfortunate kinfolk.

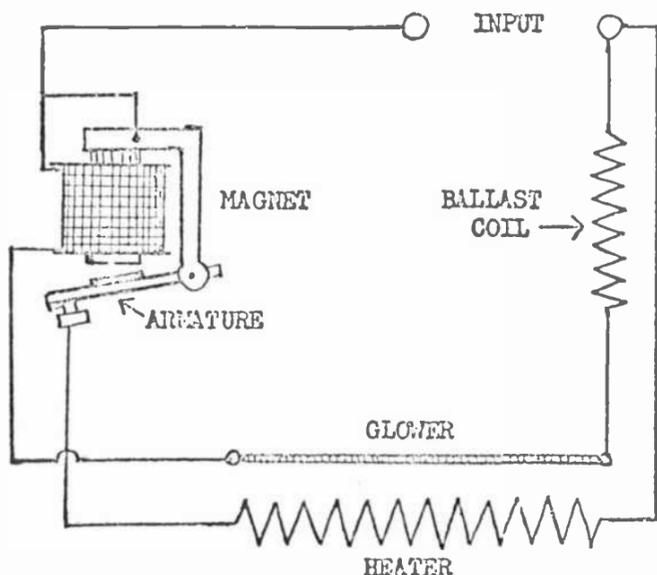
So naturally the relatives and other natives protest, threaten, and squawk loudly—which is all right by Bob—he's a long way from home.

Bob Burns' movie fame followed after his success on the radio. In 1936, he made his first Paramount picture. It was "Rhythm on the Range", with Bing Crosby and Martha Raye. "Waikiki Wedding" (again with Bing and Martha) and "Mountain Music" (with Bob as the male lead opposite Miss Raye) followed in 1937. Bob played the title role in "The Arkansas Traveler" in 1938. His movie and radio career continued until the early Forties when his land investments in the San Fernando Valley began to pay off handsomely.

During World War II, Bob performed an important duty by helping servicemen send messages to their families.

The Army named one of their rocket launcher weapons the "bazooka" because of its resemblance to his unique musical instrument. It was first used in 1942 during the Allied invasion of North Africa and was especially effective against tanks and armored cars.

Bob lived on his ranch in the San Fernando Valley until his death in 1956 at the age of 60. His original fame had been as a performer at the microphone during radio's star-studded heyday.



Greg Dockter at the controls of his 1923 MRC-12, early regenerative set built by Michigan Radio Corporation. The set consists of a one-tube tuner and a two step amplifier. Bismarck, North Dakota 1974



# MICHIGAN MIDGET

DETECTOR—\$27.

AMPLIFIER—\$30.



## The Sensation of Radio

No matter what you pay, you can't get a receiving set that will give you any better results than the Michigan "Midget."

**Distance**—It has received in Grand Rapids, stations from coast to coast.

**Selectivity**—The smallest turn of the dial throws out or brings in stations.

**Clearness**—The clearness of the reception will surprise and please you.

**The Cost**—You could not build a set, buying the parts yourself, at anything like the price at which the Midget is sold.

Made in these styles:  
 M 10 Midget Detector .....\$27.00  
 M 11 Midget Amplifier .....\$30.00  
 M 12 Midget Detector and Amplifier in one case.....\$57.00

Ask your dealer to demonstrate this wonder to you.

Write us for illustrated folder.

**MICHIGAN RADIO CORPORATION**  
 GRAND RAPIDS, MICHIGAN

February 1924 ad.

# MICHIGAN MIDGET

The Sensation of Radio



No. 10 Detector  
**\$27**



No. 11 Amplifier  
**\$30**

NEVER before have such quality sets been offered at anything like the price of the Radio Midget (both Detector Unit and Amplifier Unit).

Distance  
 Clearness  
 Selectivity

These three features stand out in the Michigan Midget and have truly made it "The Sensation of Radio." The quality of the materials and workmanship is the best and the engineering skill of design has made the Michigan Midget the long distance wonder.

Here is a set that tunes out local stations and brings in distant stations—clear and loud.

Go where you may—look over all the sets offered and then you will be more convinced than ever that there is nothing on the market to equal the Michigan Midget.

Send for catalog of other Michigan Quality Radio Products

**MICHIGAN RADIO CORPORATION**  
 GRAND RAPIDS, MICHIGAN

March 1924 ad

# The Echo-Phone



ECHO-PHONE NO. 5.

PRICE \$6.00.

## ECHO-PHONE NO. 5.

### EQUIPMENT.

Model 5 embodies all the important motor and reproducing features of Model 10, but it is not so elaborately equipped

Horn: 14 inch brass bell and steel body, with connection.

Crane: Detachable—to support the horn.

Base-Board: The machine is securely attached to a highly polished solid oak Base.

The Echo-Phone plays all standard cylinder records

## ECHO-PHONE NO. 10.

### EQUIPMENT.

Horn: 17 inch enameled Flower Horn, gold strip, with connection.

Crane: Detachable—to support the horn.

Reproducer: Concert size.

Cabinet: Highly polished Oak.

Motor: Extra heavy single spring encased in a powerful gear spring cup; can be wound while running and will play two records with one winding. The governor is driven by a metal worm gear, and the carriage is propelled by a 50-thread feed screw.

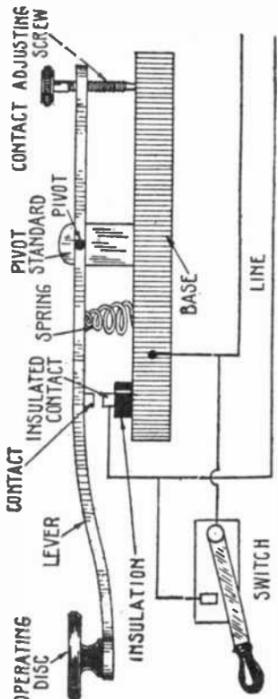
Finish: All outside metal parts are highly polished and white nicked.

Early Twentieth Century



"The whole difficulty lay in the fact that the manufacturers devote too much of their energy to the appearance and too little to the quality of their product," such a statement was the sales scheme for United Talking Machine Company, which manufactured these Echo-Phones from 259 Greenwich Street in New York.

The works of the 5 and 10 are exposed openly enough to see moving parts, a feature which attracts most collectors. For the original prices of \$6.00 and \$10.00 the Echo-Phone was a machine that was adequate in quality...to enhance a collection. Its simple method of form following function radiates its appealing character.



Elementary key. In actual construction the switch is attached to the base, but is here shown separately, in order that the connections may be more plainly seen.

Hawkins Electrical Guide #8, 1917, pp. 2204

**50 YEAR OLD FLAME PROOF KEY TYPE J-7-A**  
Gov't. Order No. 141082 Dated: 1921

Beautiful heavy duty construction, in new working condition. For the collector, antique buff and antique gear museums. An unusual conversation piece, curio, desk weight and gift.

In 1966 the U.S. Navy closed the hugh Brooklyn Navy Yard and the City of New York purchased the property. The J7A Keys were discovered in a warehouse where they had been stored for the past 50 years. Corrosion has been corrected, however, there is some slight paint peel. New boxes have been provided.

Both keys are of heavy duty construction with a large Navy type knob. The keying arm and dome are brass... the contacts are 1/4 inch coin silver. The J7A is 2 1/4 x 5 1/2 inches and the J5A is 2 1/4 x 3 1/4 inches in size. The BULB, or Lamp is NOT supplied with the J7A.

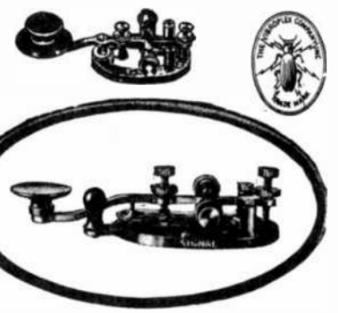
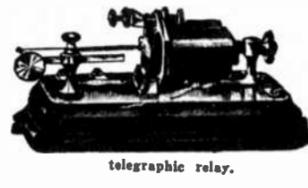
**A RARE FIND! ORDER TODAY!** **\$12.95 ppd**

The J5A was made for the Signal Corps in 1941, and is the same type of Key except for the Dome housing the neon bulb. A real memento of WWII. Supply is somewhat limited... buy today!

**\$11.95 ppd**

## EMPORIUM... "a place of trade"

WALT'S (ELECTRONIC & OLD STUFF) EMPORIUM HAS A GOOD SELECTION OF ANTIQUE - OLD & NEW KEYS - BUGS - SETS - SOUNDERS - RELAYS



### NEW KEYS - SOUNDERS - LEARNER SETS

PRICE INCLUDES POSTAGE & INSURANCE

Learner Set. Telegraph practice set. Bar frame steel, brass bridge and adjustment screws. Brass lacquer finish. Brass sounding bar—black lacquered steel sounder plate. Adjustable, brass finished key arm. Mahogany finished wood base, brass binding posts, rubber feet. 110.001 (4 ohms) ..... \$29.45

Telegraph Sounder. Designed for instant response, brass sounder provides clear, resonant tone. Steel bar frame, black enamel finish. Brass bridge and adjustment screws, instrument lacquer finish. Sounder plate is black lacquered steel. Mahogany finished wood base, brass binding posts and rubber mounting feet. 112.001 Sounder (4 ohms) ..... \$24.50

Heavy Duty Keys. Brushed brass with instrument lacquer finish, heavy die cast base. Improved Navy-type knob. Adjustable bearings and spring design give light keying touch. Large 1/4" coin silver contacts. 322.003 Black wrinkle ..... \$9.95

Standard Keys. Heavy die cast base. Smooth adjustable bearings. "Cushion-contact" design provides smooth keying action. Provision for plugging in semi-automatic keys. 1/4" coin silver contacts. A high quality key at a low cost. 310.003 Black wrinkle with switch ..... \$10.50

### SOUNDERS - RELAYS - PONY RELAYS

ALL SOUNDERS, RELAYS, AND PONY RELAYS ARE USED. THEY HAVE BEEN CLEANED, BUT NOT POLISHED. FURTHER CLEANING AND FINISHING MAY BE DESIRED. MONEY BACK GUARANTEE IF NOT SATISFIED.

- 305.1 Western Union Telegraph Co Main Line Sounder, various mfgs., white metal, wood base, model 17A, 120 ohms ..... \$25.00
- 305.2 W.U. Tele Co Main line sounder, same as above features, model 15B, 120 ohm ..... 25.00
- 315.1 J. H. Bunnell for W. U. Tele Co, 400 ohm, white metal, model 1B. (2 in stock) ..... 28.00
- 315.4 Western Electric model 15B, BRASS ..... 28.00
- 515.1 Western Electric RELAY, Sharp looking, some brass, on mahogany base on heavy iron base, 150 ohm, one only! Cleaned ..... 40.00
- 515.2 Telegraph RELAY mounted on hvy. slate ..... 29.00
- 615.1 PONY RELAY W U TELE CO. Small and neat looking, model 3D, 16 ohm, needs cleaning ..... 27.50
- 615.3 PONY RELAY, model 4B, 140 ohm. . . . . 27.50
- 615.5 W U Tele Co., Model 3C, 16 ohm. . . . . 27.50

### KEYS - SETS - POLE CHANGERS

- 115.2 C. T. E. Telephonics Navy knob, contacts enclosed, real nice key ..... \$ 9.95
  - 115.3 Western Union Telegraph Co POLE CHANGER KEY, STRAIGHT, with switch, used extensively by WU Telegraph Co. A very simple form of hand pole changer. Double contact, front and back, hard rubber base, Mfg. by Spies Electric Co., Type 1B ..... 21.50
  - 115.10 Signal Elect. Mfg. Co, Menominee, Michg. legless key, brass, steel arm ..... 12.00
  - 115.11 Key, Navy knob, legless ..... 10.95
  - 115.12 Brass Key, previous owner says he bought it used and used it for 40 years... knob shows many years of usage ..... 9.95
  - 115.13 KEY, OLD- Brass, enamel over brass, shorting bar, mounted on walnut base, 3" x 5 1/2", a real oldie that needs a home ..... 14.95
  - 115.14 KEY, label "BRACH" shorting bar on oak base, 3" x 5 1/2", one only, hurry! ..... 19.95
  - 215.1 VIBROPLEX 81040, painted grey, good action, don't know model number. . . . . 22.50
  - 215.2 Vibroplex, label removed, black crackle finish, real clean. . . . . 20.00
- SETS, LEARNER TYPE. These consist of a full size Morse Telegraph SOUNDER and KEY mounted on Walnut base. Enhances any Ham shack or OT
- 415.1 MENOMINEE Set with key and Sounder, clean ..... 45.00
  - 415.2 KEY and Sounder set, clean, no label ..... 40.00
  - 415.3 Manhattan Elect. Supply Co Key and sounder clean and sharp looking ..... 45.00
  - 415.4 Mesco Set, base could use refinishing . . . . . 35.00
  - 415.5 BUNNELL Duplex key and Sounder set . . . . . 45.00



### ORDERING NOTES

1. All orders shipped prepaid and insured
2. Shipped by Parcel Post or UPS (No UPS to PO Box)
3. Please PRINT NAME AND ADDRESS
4. 30 day money back guarantee if not satisfied
5. Orders shipped within 5 to 15 days

NOTE: All Old items are cleaned, BUT NOT POLISHED!

It is planned to print a new list each Jan, April, July, and Oct. To be assured a copy of each issue, please send a large (# 10) SASE. The contents will include Telegraph Keys, Bugs, Sounders, Relays, Radios, Telephones, and Technical Books.

# WALTS EMPORIUM

P. O. BOX 19406

DALLAS, TEXAS 75219

WORKDAYS - 214-526-2023

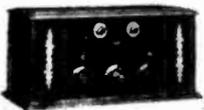
\* EVENINGS - 214-262-7855



TRADE NAME: "Workrite Aristocrat."  
 TYPE: Neutrodyne with built-in loud speaker.  
 TUBES: Five.  
 BATTERIES: Compartment in cabinet for "A" and "B" batteries.  
 CONTROLS: Three.  
 AERIAL: Inside or outside.  
 PRICE: \$350.00 without accessories, but with loud speaker.  
 MANUFACTURER'S NAME: Workrite Mfg. Company.



TRADE NAME: "Workrite."  
 MODEL: Radio King.  
 TYPE: Neutrodyne with built-in loud speaker.  
 TUBES: Five.  
 BATTERIES: "A" and "B" needed.  
 CONTROLS: Three.  
 AERIAL: Inside or outside.  
 PRICE: \$180.00 without accessories.  
 MANUFACTURER'S NAME: Workrite Mfg. Company.



TRADE NAME: Wright.  
 MODEL: 5A.  
 TYPE: Tuned radio frequency, detector and audio frequency.  
 TUBES: Five.  
 BATTERIES: "A," "B" and "C" furnished.  
 CONTROLS: Three.  
 AERIAL: Outside or inside.  
 PRICE: \$160.00 including tubes and batteries.  
 MANUFACTURER'S NAME: H. Earle Wright.

TRADE NAME: Zenith.  
 MODEL: Three R.  
 TYPE: Regenerative detector and three audio frequency.  
 TUBES: Four.  
 BATTERIES: None furnished.  
 CONTROLS: Two.  
 LOOP: Outdoor or indoor.  
 PRICE: \$160.00 without accessories.  
 MANUFACTURER'S NAME: Zenith Radio Corp.



TRADE NAME: Zenith.  
 MODEL: Four R.  
 TYPE: Regenerative detector and three audio frequency.  
 TUBES: Four.  
 BATTERIES: None furnished.  
 CONTROLS: Two.  
 AERIAL: Outdoor.  
 PRICE: \$95.00 without accessories.  
 MANUFACTURER'S NAME: Zenith Radio Corp.



TRADE NAME: Zenith.  
 MODEL: Super 7.  
 TYPE: Two stages tuned radio frequency, detector and 3 audio.  
 TUBES: Six.  
 BATTERIES: None furnished.  
 CONTROLS: Two.  
 AERIAL: Indoor or outdoor.  
 PRICE: \$230.00 without accessories.  
 MANUFACTURER'S NAME: Zenith Radio Corp.



TRADE NAME: Zenith.  
 MODEL: Super 8.  
 TYPE: Two stages tuned radio frequency, detector and three audio.  
 TUBES: Six.  
 BATTERIES: None furnished.  
 CONTROLS: Two.  
 AERIAL: Indoor or outdoor.  
 PRICE: \$250.00 without accessories.  
 MANUFACTURER'S NAME: Zenith Radio Corp.



TRADE NAME: Zenith.  
 MODEL: Super 9.  
 TYPE: Built-in loud speaker.  
 TUBES: Six.  
 BATTERIES: None furnished.  
 CONTROLS: Two.  
 AERIAL: Indoor or outdoor.  
 PRICE: \$350.00 without accessories.  
 MANUFACTURER'S NAME: Zenith Radio Corp.



TRADE NAME: Zenith.  
 MODEL: Super 10.  
 TYPE: Built-in loud speaker and battery eliminator.  
 TUBES: Six.  
 BATTERIES: House current employed.  
 CONTROLS: Two.  
 AERIAL: Indoor or outdoor.  
 PRICE: \$550.00.  
 MANUFACTURER'S NAME: Zenith Radio Corp.

# The Classic Radio

BY J. W. F. PUETT

In preparation for the biographical sketch on E. H. Scott to be concluded next month, we present Part One—a list of the sets manufactured by the laboratory both before and after Mr. Scott retired:

Herewith, our list, as complete as possible at press time. We would like to hear from anyone who can supply corrections or additions.

9 Tube Super-Heterodyne "Coast to Coast" Variable Mu-Pentode Push-Pull Receiver.



Requires 3-225, 2-227, 1-224, 2-247, 1-280 Tubes.  
 CONSISTS MAINLY OF POLYMET PARTS!

All the parts come to you bolted to a durable and attractively finished steel chassis, measuring 15 in. long, 11 1/4 in. wide, by 8 3/4 in. tall. Note also the 3 Electrolytic Condensers (24 Mfd. Total)—assuring Hum-Free Reproduction! Exclusive Features: High-shielded 4-gang Amsco-De Jur Oscillator Tracking Section Condenser, Traveling Spot Light Vernier Tuning Dial, Three 175 K.C. Shielded I.F. Units, Band Pass R.F. Transformer, Twin Jacks for Phono Pick-up (or Microphone), and additional Dynamic (A.C.) Speaker (or up to 100 Magnetics or Television Lamp), Shielded R. F. Tubes, Volume Control, Tone Control, A.C. Line Switch, Phono Pick-up, Radio Switch, Socket Provision for Connections of 5-Prong Speaker Plug.  
 Furnishes FIELD EXCITATION for a 2500 ohm D.C. DYNAMIC SPEAKER  
 Semi-Assembled \$34.50  
 Factory Wired \$44.50  
 Matched Jensen "Concert" D.C. Dynamic Speaker \$11.45

1932

General Electrical Synchronous Phono. Motor



Complete with a felt lined turn-table. Turntable revolves at the exact prescribed rate, despite any voltage variations. Only 3 1/4 in. deep! For 110 volt, 50-60 cycle A.C. \$3.75

R.C.A.-Victor-Kellogg Recording and High Gain Speech Microphone



For hand use—6 1/2 in. long. HIGHEST QUALITY OBTAINABLE! \$3.95

1932

Magnetic Speaker Chassis



Burtex cloth diaphragm. Over-size tungsten steel magnet. WILL NOT DISTORT or RATTLE—despite terrific volume requirements! Over-all diameter sturdy steel chassis: 9 in. — 5 3/4 in. deep! The shell partly serves as a S.P.L.P. BAFLE! Ideal for use in MULTI-SPEAKER PUBLIC ADDRESS INSTALLATIONS. \$2.95 Each

1932

R. C. A. Loudspeaker 103

A beautiful speaker, superb in its faithful reproduction. Molded frame and pedestal resemble hand carved oak. Mechanism concealed by attractive tapestry.

(Genuine R.C.A.) List \$18.00



OUR PRICE

\$3.43

DATE	MODEL	STAGES	REMARKS
		RF IF	
1925 to 1929	AC SYMPHONY WORLD RECORD, 8, 9 & 10		very little known about this set 8, 9 & 10 tubes, respectively
1931	ALL WAVE 12	1 3	12 tubes two dial tuning
1933	ALL WAVE 12	1 3	12 tubes single dial tuning
1934	ALL WAVE 15 ALL WAVE 2V	1 3 1 3	15 tubes with best freq. oscillator 11 tubes battery operation
1936	ALL WAVE HIGH FIDELITY Volume Range Expander QUARANTA	1 4	23 tubes 4 tubes-accessory 40 tubes-very little known
1937	PHILHARMONIC	1 4	30 tubes pointer dial 5/22/37
1938 to 1939	16 and 18 SUPER XII MASTERPIECE PHANTOM PHILHARMONIC revised	1 3 1 3 1 3 1 3 2 4	16 and 18 tubes 8/19/38 12 tubes 11/11/38 14 tubes 11/12/39 19 tubes 30 tubes beam of light dial
1940 to 1941	PHILHARMONIC COMBINATION FM TUNER LAURETTE PHANTOM revised	2 4 1 2 1 3	33 tubes FM built in no vol. ex. 10 tubes accessory 18 tubes 4/6/41 23 tubes with FM
WW II	SLR-12-A MARINE RECEIVER	1 2	12 tubes low radiation
1942 to 1945	RCH receiver SLRM MARINE RECEIVER	1 2	Type CZC-49587-low radiation 12 tubes AC/DC low radiation
1946 to 1949	EXPORT RECEIVER	1 2	12 tubes AC/DC similar to SLRM circuit
	500 AM/FM	1 2	same as Radio Craftsman RC-8 tuner
	800B AM/FM/SW	1 2	24 tubes electric tuning remote control
	1500 AM/FM/SW		very little known
1950	310 510, 510K, 510S 515	1 2 1 2 1 2	12 tubes 25/5/50 14 tubes 13 tubes similar to 510 series

VARIOUS OTHER MODELS FOLLOWED—some with TV Models 710, 910, 924, and 1000TC.

1901 TALKING MACHINE SUPPLIES

Summary of Disc Machine Horns to be Used with Leather Elbows

Length	Width Bell	Depth Bell	Width Throat	List	Description
14 1/2 in.	9 3/8 in.	2 1/2 in.	5 in.	\$1.50	All Brass
14 1/2 in.	9 3/8 in.	2 1/2 in.	5 in.	1.50	B. B. Jap. Top
19 in.	11 3/8 in.	4 in.	6 3/8 in.	3.50	All Brass
19 in.	11 3/8 in.	4 in.	6 3/8 in.	3.50	B. B. Jap. Top
27 in.	14 in.	3 1/2 in.	6 3/4 in.	5.00	All Brass
27 in.	14 in.	3 1/2 in.	6 3/4 in.	5.00	B. B. Jap. Top
40 in.	20 1/2 in.	4 1/2 in.	10 in.	12.00	All Brass
40 in.	20 1/2 in.	4 1/2 in.	10 in.	12.00	B. B. Jap. Top

Leather Elbows for Disc Machine Horns

No. 602, BLACK LEATHER  
No. 603, RUSSET LEATHER



Price, 40 Cents

Of best selected stiff leather, neatly sewn and made of proper diameter to fit the Sound Box and Horn.

# MART

## EASY COST CHART FOR CLASSIFIED ADS

No. Words	One Issue	Two Issues	Three Issues	Twelve Issues
1-25	1.25	2.45	3.65	12.75
26-50	1.70	2.90	4.10	15.30
51-75	1.95	3.40	4.80	17.80
76-100	2.25	3.90	5.50	20.35
101-125	2.50	4.40	6.15	22.95
126-150	2.75	4.90	6.85	25.45
151-200	3.05	5.30	7.55	28.00
201-250	3.30	5.80	8.25	30.55
251-300	3.65	6.30	8.95	33.05
301-350	3.90	6.75	9.65	35.60
351-400	4.15	7.25	10.30	38.20
401-450	4.45	7.75	11.00	40.75
451-500	4.70	8.20	11.70	43.25
501-550	5.00	8.70	12.35	45.80
551-600	5.25	9.20	13.05	48.40
601-650	5.50	9.65	13.75	50.90
651-700	5.75	10.15	14.45	53.40
701-750	6.00	10.60	15.15	55.90
751-800	6.25	11.10	15.85	58.40
801-850	6.50	11.55	16.55	60.90
851-900	6.75	12.05	17.25	63.40
901-950	7.00	12.55	17.95	65.90
951-1000	7.25	13.05	18.65	68.40
1001-1100	7.75	13.55	19.35	71.25
1101-1200	8.25	14.05	20.05	74.10
1201-1300	8.75	14.55	20.75	76.95

Photo ads \$2.00 extra.

### MISC.

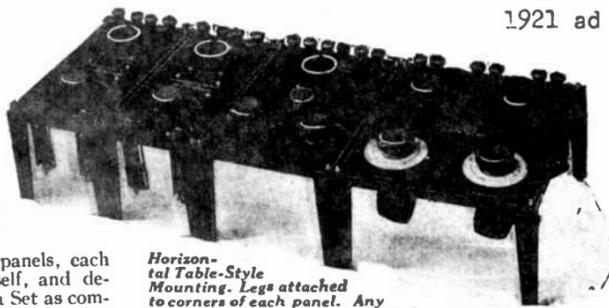
CLASSIC and ANTIQUE RADIOS and Mechanical Phonographs restored, bought, sold. Reproducers and Magnetic Pickups rebuilt. Send SASE for parts and services available. Twentieth Century Talking Machine Co., 856 Cole St., San Francisco 94117. MO 4-0469.

COLLECT old phonographs and records? We have a publication for you called, "The New Amberola Graphic", and will send a sample for 25¢. Our line of reprinted materials is expanding, and we'd be happy to send our circular. NAPCO, 133 Main, St. Johnsbury, Vermont 05819.



## INTERPANEL SET

The Most Advanced Idea in Radio Telephone Transmitting and Receiving Apparatus



THE INTERPANEL Set consists of a series of panels, each comprising a complete piece of apparatus in itself, and designed to be combined with other panels, thus making a Set as complete as desired. The Set shown below contains these units, reading from right to left in the picture:

- Complete Radiophone Transmitter, transmitting speech at least 30 miles; Type OT-3; two panels;
- Complete short wave Tuner of highest efficiency; Type MT-100; one panel;
- New Audion Control panel designed especially for tubes of the gaseous type, now considered as standard; Type MP-100; one panel; and
- One-step Amplifier complete in every respect; Type MP-200; one panel. (Additional steps of amplification may be added).



Complete Set of four units (five panels) mounted in cabinet without batteries or tubes; \$189.25. Panels are also sold separately for mounting in home-made cabinet; or with legs for Vertical or Horizontal Table-style mounting. Get full particulars at once.

Horizontal Table-Style Mounting. Legs attached to corners of each panel. Any number of pane can be mounted in this style. Ample space under panels for batteries. Very convenient and inexpensive method of mounting.

PANELS are all 9 inches high, varying widths. Adaptable to any operating requirement and when placed side by side all binding posts are in line and convenient to wire.

30 Miles Range for the Telephone Transmitter on Average Amateur Antenna.

Only one 6-volt battery required for all filaments and microphone; motor-generator, "B" battery or rectifier supply may be used.

Send Now for Catalogue "E"

Get full details and place your order early to assure quick delivery.

### De Forest Radio Tel. & Tel. Co.

Inventors and Manufacturers of High Grade Radio Apparatus.

1415 Sedgwick Ave. New York City

### NEW 1973 VINTAGE RADIO

Enthusiastic readers bought out our first edition. Now you can send for the fascinating new edition of this pictorial history of wireless and radio, 1887-1929. It's the collector's bible, with 263 pages and over 1,000 illustrations. Available in handbook or deluxe hard cover.

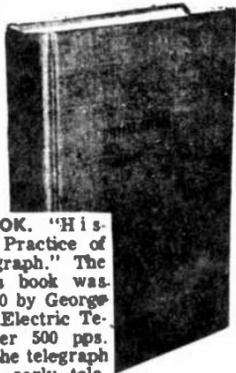


### McMAHON'S 1921-1932 GUIDE

Be an instant expert. Lists 9,000 radio models by maker and year introduced, with original price, description and circuit type. A must for every radio buff or antique collector.

Vintage Radio, handbook \$4.95

McMahon's 1921-32 Radio Guide 3.95



TELEGRAPH BOOK, "History, Theory & Practice of the Electric Telegraph." The orig. copy of this book was first printed in 1860 by George Prescott, Supt. of Electric Telegraph lines. Over 500 pps. of information on the telegraph & many illus. of early telegraph equipment. Reprints of this book \$7.50 ea., ppd.

## BACK ISSUES

### ORDER NOW!

THE HORN SPEAKER NEWSPAPER

All 10 back issues for 1973 \$5.00

- January '72 .....25¢ ea.
- February '72.....\$1.00 ea.
- March '72 .....\$1.00 ea.
- April '72 .....\$1.50 ea.
- May '72 .....50¢ ea.
- June '72 .....50¢ ea.
- August '72 .....50¢ ea.
- September '72 .....75¢ ea.
- October '72 .....75¢ ea.
- December '72 .....25¢ ea.

All 20 back issues for 1972 and 1973, while they last...\$10.00.

Any issue from Jan.'73 to now..50¢ ea.



EDISON PHONOGRAPHS 1912-13 (Cylinder Models), illustrated 5 x 8" catalog reprint. \$3.00 ppd. Satisfaction guaranteed.

## THE FABULOUS PHONOGRAPH

From Edison to Stereo

New and Revised Edition

by Roland Gelatt

Ever since 1877 when Thomas Edison invented a curious tin-foil apparatus to reproduce sound, the phonograph has provided entertainment and the delights of music for millions of listeners.

Roland Gelatt's history of this truly fabulous invention is a classic work in its field, and this revised edition covers new developments in stereo, recordings, and tapes.

\$9.95

Special

Announcing: New limited reprint of S. Gernsback's 1927 RADIO ENCYCLOPEDIA, a priceless record of old-time wireless and radio. Choice of hard-cover or handbook. 175 pages. 1,000 subjects. Radio Encyclopedia, hard cover 12.95

## The Horn Speaker Book Sales

Box 12 Kleberg, Texas 75145

Send \_\_\_\_\_ PLEASE PRINT  
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 Enclosed is \$ \_\_\_\_\_  
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## MISC.

WILL DUPLICATE exactly, the mutilated panel for your antique radio. Send sketch or rubbing for quotation, or will trade for antique radios of equal value. Aladdin Name Plate Co., 22 Forest St., Branford CT 06405.

LOW RATES ON OLD RADIO PROGRAMS; Also available: 1929 Atwater-Kent radio commercial. Send 10¢ stamp for information. BRC QUALITY DUBS, 17173 Westbrook Drive, Livonia, Michigan 48152.

Will Repair, restore, refinish, renew or rebuild your old radio. Buy, sell or trade tubes, parts and radios. Bob Lucas, 9014 Mahoning, Houston TX 77036.

FOR SALE: Rubber stamp with your name and address plus AK Radio and speaker \$3.00 pp. James Fred, P. O. 42, Rossville IN 46065.

1921-1931 schematics and service data where available \$2.00. Cecil Bounds, Pine Springs Rte., Carlsbad, N. M. 88220.

## FOR SALE OR TRADE

TWENTIETH CENTURY COLUMBIA, case good and good working condition, no horn, \$475.00, or trade. Bill Boruff, 1619 Day Star, Dallas TX 75224.



ANTIQUe Televisions from 1930s to 1940s. Hallicrafters, Pilots, RCA, Transvision, Philco, Andera, Crosley, more. Send \$1.00 for picture and information. Seidel, 614 Grove Lane, Santa Barbara CA 93105. Pho: 805-687-7967.

FOR SALE: Western Electric VT5, new in original ctn. (sealed-never opened) \$7.50 each, plus postage. Also, new VT5, good filament, unboxed, \$5.50 ea. plus postage. Please enclose estimated postage with your order - unused money will be returned. Floyd Lyons, 456 Post St., San Francisco CA 94102. Ph: 415-392-6600.

FOR SALE TUBES: 71-A, new boxed surplus, \$3.00. CX374, old style, used, \$2.00. CX374 stenciled 'Property of Atwater Kent Mfg. Co.' \$4.00. 81 old style, used, \$4.00, 2A7, new RCA boxed \$3.00. Add \$1.00 shipping. Alan Douglas, Box 225, Pocasset MA 02559.

ONE LOT PRICE: 70-set collection of Antique Radios (Federal, Kennedy, A-K, Grebe, Crosley, etc.) including speakers tubes, etc., \$3200. Stamped envelope for list. Crocker, Tavern Path, Plymouth, Mass. 02360.

FOR SALE: Rare magazine, First issue Vol. 1, #1, March 1928 of "Television". Stated the worlds first Television Journal. Published in Great Britain. Mint Condition, best offer. Guy Martin, P. O. Box A, Azusa CA 91702.

## FOR SALE OR TRADE

FOR SALE:

GREBE, one tube regen receiver, model CR-8, mint original...\$175.  
GREBE, 2 stage audio amplifier model RORK, mint, original...\$75.  
RADIOLA III, Beautiful condition, with 2 good black base WD-11s...\$70.  
MCMURDO SILVER, Chromium plated 20 tube classic Masterpiece VI, complete with chromium cover and original Jensen 14" speaker. Absolutely mint condition.....\$225.  
ATWATER KENT, model 20 large, with brass binding posts.....\$70.  
CROSLEY, 3 tube Trirdyn, early model, fine condition.....\$75.  
KEN-RAD, 1920 crystal set. Never used, still in original factory container.....\$85.  
Hans R. Hermann, Box 236, Fisher St., Franklin, Mass. 02038.

AERIOLA SR. receiver with replacement tube \$70.00.  
MOTOROLA T. V. with 8" screen, working, late 1940s \$75.00.  
VOLUME II AND III Riders \$10.00 ea.,  
TUNGAR battery charger \$5.00.  
RADIO BROADCAST for June and August 1925 \$3.00 each.  
QST for October and November \$3.00 ea.  
RADIO NEWS Amateurs handibook Vol.1 1924 \$6.00.  
POPULAR SCIENCE, 2 bound volumes 1917 \$13.00.  
TWO GLASS NEGATIVES of New York \$10.  
OIA tubes \$5.00 each. Postage extra.  
Lonny Simonian, 6222 E. Townsend, Fresno CA 93727.

FOR SALE: Two sets of Tyne's "SAGA OF THE VACUUM TUBE" (23 issues - Radio News) \$49.50 per set, plus postage. Floyd Lyons, Elks Club, 456 Post St., San Francisco, CA 94102.

FOR SALE: Over 65 radio fiction hard back books. All the Radio Boys Series, Radiophone Boys, Motorboat Boys, etc., \$2.50 each. Send SASE for list. Guy Martin, Box A, Azusa CA 91702.

WD11 Adaptors, use UX199, 120, VT24. No wiring changes, Radiola III's battery hook up included \$5.25 pp., 2 for \$9.25. Keith Parry, 17557 Horace St., Granada Hills CA 91344.

FOR SALE: Type 864 (VT-24) tubes. New guaranteed. Electrical replacement for WD-11, WD-12, etc. \$2.00 each, postpaid. Quantity Limited. Len D'Airo, Box 54, Massapequa Park, N. Y. 11762.

FOR SALE-400 Radios, etc., as a lot (no list) interested people stop in. Open Thursday, Friday and Saturday 11 AM to 5 PM. Pat Cutini, 969 Genesee, Buffalo, N. Y.

FOR SALE: Vols. 1-14 Riders - Best offer over \$100. plus shipping, or trade for good loose coupler (factory made). Dick Brewster, 1 Concord Rd., Fishkill, N. Y. 12524.

FOR SALE: Vintage radios, reproducers and headphones. Send SASE for list to Arthur Harrison, 1021 Falcon Drive, Columbia, Missouri 65201.

FOR SALE: Crosley Pup, refinished to excellent condition \$75. G. B. Schneider, 6848 Commonwealth, Parma Hgts, Ohio 44130.

FOR SALE: #10 Atwater-Kent "bread-board radio, good condition. George Miller, 6537 Turner Way, Dallas TX 75230.

## FOR SALE OR TRADE

TUBES - WD-11, WD-12, 201A, 199, 216A, 211A, Vt-1, VT-2, 203A, 226, 227, 245, 280, 224A, many with brass bases, many other types. SASE for large list. Also for sale; Crosley power supply, 1922 - 1942 Radio flyers and catalogs, W. E. telephone operators breast plate mike and headphone, 3 tube aircraft receiver, W. E. color TV monitor, old audio oscillator. Cecil Bounds, Pine Springs Rte. Carlsbad, N. M. 88220.

FOR SALE: Battery radios from 1920 to 1945 (portables) crystal sets, tubes, parts, speakers, headphones, shortwave sets, magazines, books, early electric sets, cathedral radios, "A & B" ELms, tube testers, chassis, wood cab's. Perfer to sell local, you pick up. Krantz, 714 White Horse Pike, Stratford, N. J. 08084. Ph; 609-783-0400.

## WANTED

WANTED: For Federal Model 61 Audio interstage transformer, Antenna - loop control, main tuning condenser. For Stromberg 635 AC treasure chest, cabinet lid and metal feet. P. Ciancia, 10 Glenwood Ave., Leonia, N. J. 07605.

WANT EARLY Radio Magazines pre-1925. Have many duplicates of years 1930 - 1949 of Radio News, Short Wave Craft, Radio Craft, Service, etc., to trade or sell. Nothing over \$1.50. Five page list 50¢. Collectorium, 2444 Edison Hwy., Bakersfield CA 93307.

WANTED: David Grimes Inverse Duplex Model 4DL; Hammarlund Roberts HiQ6 battery set; Westinghouse R. E. antenna tuner; Westinghouse A. R., R. F. amplifier. J. Albert Warren, Box 279 - Church St., Waverly PA 18471.

NEED lower half Edison Cygnet Horn, motor or parts for Columbia AH disc outside horn phonograph, also cylinder record cabinet. Thurman Justus, Rt. 1, Box 1222, Spanaway, Washington 98387.

WANTED for historic research; Any information or material concerning television broadcasting in the Los Angeles area before 1945. Steve Runyon, 727 Quintara, San Francisco 94116.

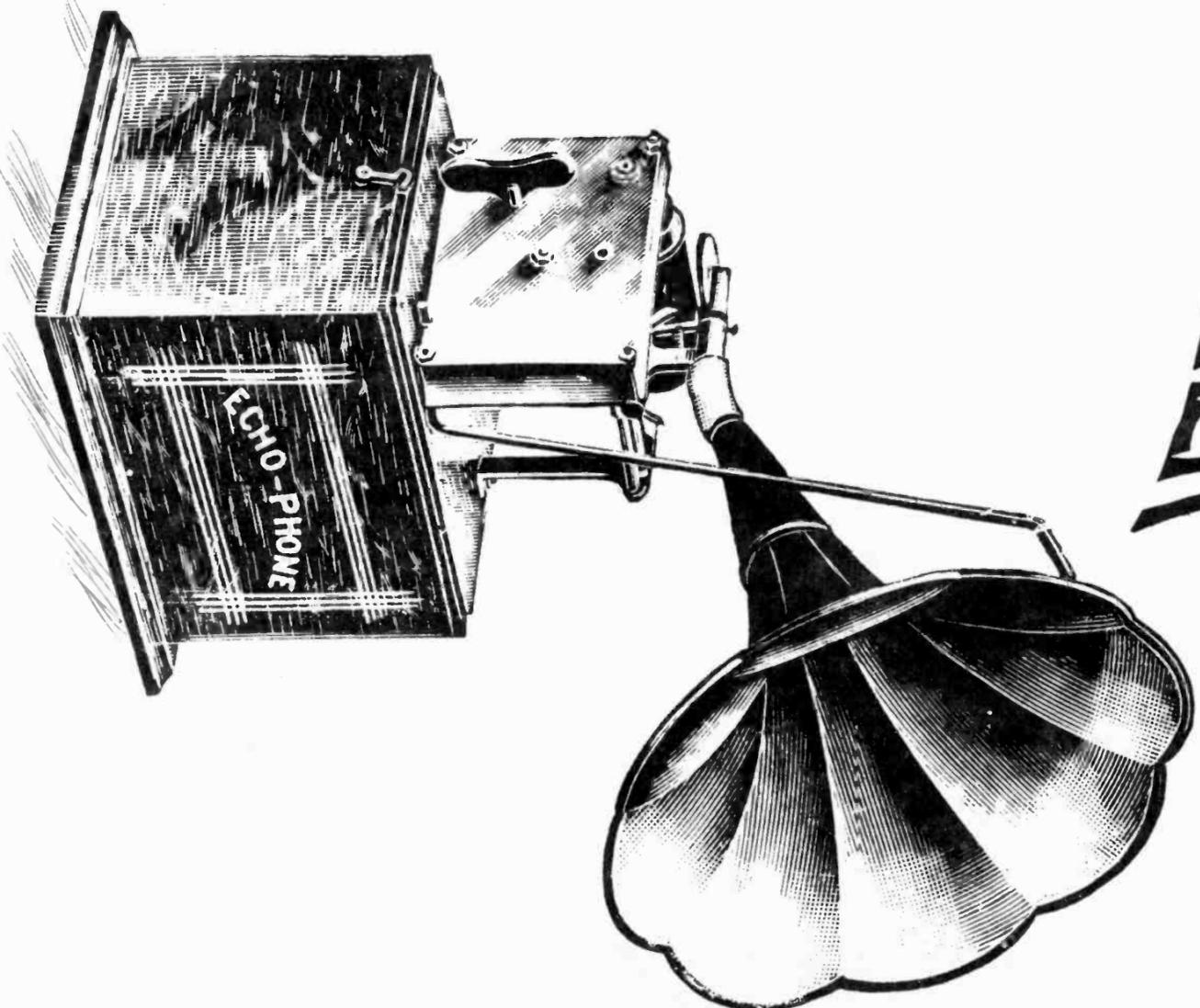
WANTED: Early Multi-Band or high quality short wave receivers. Also any Scott or McMurdo Silver De-Luxe Models. John L. Glisson, 1303 Pump Road, Richmond, VA 23229.

WANTED: Old radio books, catalogs, Gernsback manuals, Early test equipment. Give price in first letter. William Hemrick, Route 1, Terra Alta, West Virginia 26764.

WANTED: Record catalogs and supplements early 1890-1940. Also dealer numerical catalogs, for research. Reply guaranteed. T. Brooks, 1940 80th, Jackson Heights, N. Y. 11370.

WANTED: Lid for an Atwater Kent Model 46, need not be perfect, minor dents or rust OK. Ted McMullen, 1730 Ridge Road, Bakersfield CA 93305. Ph: 805-323-0136.

# THE HORN SPEAKER



## ECHO-PHONE NO. 10.

Mr. Gary B. Schmitt  
6948 Commonwealth Blvd.  
Parma Heights, Ohio 44130

### Puett electronics 3008 ABSTON DRIVE MESQUITE, TEXAS 75149

HOW TO ORDER: Please check off money orders available to U.S. Postal. (1) Please state whether new or used tubes are desired and (2) whether a reduced-price used tube is desired when a new tube is out of stock. REFUNDS are mailed with your invoice for out-of-stock tubes, or when, by customer request, a used tube is substituted for an out-of-stock new tube. INCLUDE 15¢ FOR POSTAGE & HANDLING. POSTAGE IS PAID BY SELLER. (3) ALL ORDERS ARE SHIPPED PARCEL POST. RESIDENTS ADD 5¢ STATE SALES TAX. MINIMUM ORDER \$3.00.

IN TABLES 1, 4 & 6 THE SYMBOL n INDICATES THAT A TUBE IS AVAILABLE NEW AND THE SYMBOL u INDICATES THAT IT IS AVAILABLE USED.

TABLE 1 - OLDER TYPE-NUMBER TUBES - prices listed for new tubes

0	u	4.4	523	nu	2.2	6275	nu	3.3	1465	n	3.3	55	n	3.3
1A3	u	3.3	524	nu	2.2	744	nu	3.3	1467	n	3.3	56	n	3.3
1A4	u	3.3	525	nu	2.2	745	nu	3.3	1468	n	3.3	57	n	3.3
1A5	u	3.3	526	nu	2.2	746	nu	3.3	1469	n	3.3	58	n	3.3
1A6	u	3.3	527	nu	2.2	747	nu	3.3	1470	n	3.3	59	n	3.3
1A7	u	3.3	528	nu	2.2	748	nu	3.3	1471	n	3.3	60	n	3.3
1B4	u	3.3	529	nu	2.2	749	nu	3.3	1472	n	3.3	61	n	3.3
1B5	u	3.3	530	nu	2.2	750	nu	3.3	1473	n	3.3	62	n	3.3
1C6	u	3.3	531	nu	2.2	751	nu	3.3	1474	n	3.3	63	n	3.3
1C7	u	3.3	532	nu	2.2	752	nu	3.3	1475	n	3.3	64	n	3.3
1D8	u	3.3	533	nu	2.2	753	nu	3.3	1476	n	3.3	65	n	3.3
1E2	u	3.3	534	nu	2.2	754	nu	3.3	1477	n	3.3	66	n	3.3
1E7	u	3.3	535	nu	2.2	755	nu	3.3	1478	n	3.3	67	n	3.3
1F4	u	3.3	536	nu	2.2	756	nu	3.3	1479	n	3.3	68	n	3.3
1G4	u	3.3	537	nu	2.2	757	nu	3.3	1480	n	3.3	69	n	3.3
1G5	u	3.3	538	nu	2.2	758	nu	3.3	1481	n	3.3	70	n	3.3
1G6	u	3.3	539	nu	2.2	759	nu	3.3	1482	n	3.3	71	n	3.3
1H4	u	3.3	540	nu	2.2	760	nu	3.3	1483	n	3.3	72	n	3.3
1H5	u	3.3	541	nu	2.2	761	nu	3.3	1484	n	3.3	73	n	3.3
1H6	u	3.3	542	nu	2.2	762	nu	3.3	1485	n	3.3	74	n	3.3
1H7	u	3.3	543	nu	2.2	763	nu	3.3	1486	n	3.3	75	n	3.3
1H8	u	3.3	544	nu	2.2	764	nu	3.3	1487	n	3.3	76	n	3.3
1H9	u	3.3	545	nu	2.2	765	nu	3.3	1488	n	3.3	77	n	3.3
1H0	u	3.3	546	nu	2.2	766	nu	3.3	1489	n	3.3	78	n	3.3
1H1	u	3.3	547	nu	2.2	767	nu	3.3	1490	n	3.3	79	n	3.3
1H2	u	3.3	548	nu	2.2	768	nu	3.3	1491	n	3.3	80	n	3.3
1H3	u	3.3	549	nu	2.2	769	nu	3.3	1492	n	3.3	81	n	3.3
1H4	u	3.3	550	nu	2.2	770	nu	3.3	1493	n	3.3	82	n	3.3
1H5	u	3.3	551	nu	2.2	771	nu	3.3	1494	n	3.3	83	n	3.3
1H6	u	3.3	552	nu	2.2	772	nu	3.3	1495	n	3.3	84	n	3.3
1H7	u	3.3	553	nu	2.2	773	nu	3.3	1496	n	3.3	85	n	3.3
1H8	u	3.3	554	nu	2.2	774	nu	3.3	1497	n	3.3	86	n	3.3
1H9	u	3.3	555	nu	2.2	775	nu	3.3	1498	n	3.3	87	n	3.3
1H0	u	3.3	556	nu	2.2	776	nu	3.3	1499	n	3.3	88	n	3.3
1H1	u	3.3	557	nu	2.2	777	nu	3.3	1500	n	3.3	89	n	3.3
1H2	u	3.3	558	nu	2.2	778	nu	3.3	1501	n	3.3	90	n	3.3
1H3	u	3.3	559	nu	2.2	779	nu	3.3	1502	n	3.3	91	n	3.3
1H4	u	3.3	560	nu	2.2	780	nu	3.3	1503	n	3.3	92	n	3.3
1H5	u	3.3	561	nu	2.2	781	nu	3.3	1504	n	3.3	93	n	3.3
1H6	u	3.3	562	nu	2.2	782	nu	3.3	1505	n	3.3	94	n	3.3
1H7	u	3.3	563	nu	2.2	783	nu	3.3	1506	n	3.3	95	n	3.3
1H8	u	3.3	564	nu	2.2	784	nu	3.3	1507	n	3.3	96	n	3.3
1H9	u	3.3	565	nu	2.2	785	nu	3.3	1508	n	3.3	97	n	3.3
1H0	u	3.3	566	nu	2.2	786	nu	3.3	1509	n	3.3	98	n	3.3
1H1	u	3.3	567	nu	2.2	787	nu	3.3	1510	n	3.3	99	n	3.3
1H2	u	3.3	568	nu	2.2	788	nu	3.3	1511	n	3.3	100	n	3.3
1H3	u	3.3	569	nu	2.2	789	nu	3.3	1512	n	3.3	101	n	3.3
1H4	u	3.3	570	nu	2.2	790	nu	3.3	1513	n	3.3	102	n	3.3
1H5	u	3.3	571	nu	2.2	791	nu	3.3	1514	n	3.3	103	n	3.3
1H6	u	3.3	572	nu	2.2	792	nu	3.3	1515	n	3.3	104	n	3.3
1H7	u	3.3	573	nu	2.2	793	nu	3.3	1516	n	3.3	105	n	3.3
1H8	u	3.3	574	nu	2.2	794	nu	3.3	1517	n	3.3	106	n	3.3
1H9	u	3.3	575	nu	2.2	795	nu	3.3	1518	n	3.3	107	n	3.3
1H0	u	3.3	576	nu	2.2	796	nu	3.3	1519	n	3.3	108	n	3.3
1H1	u	3.3	577	nu	2.2	797	nu	3.3	1520	n	3.3	109	n	3.3
1H2	u	3.3	578	nu	2.2	798	nu	3.3	1521	n	3.3	110	n	3.3
1H3	u	3.3	579	nu	2.2	799	nu	3.3	1522	n	3.3	111	n	3.3
1H4	u	3.3	580	nu	2.2	800	nu	3.3	1523	n	3.3	112	n	3.3
1H5	u	3.3	581	nu	2.2	801	nu	3.3	1524	n	3.3	113	n	3.3
1H6	u	3.3	582	nu	2.2	802	nu	3.3	1525	n	3.3	114	n	3.3
1H7	u	3.3	583	nu	2.2	803	nu	3.3	1526	n	3.3	115	n	3.3
1H8	u	3.3	584	nu	2.2	804	nu	3.3	1527	n	3.3	116	n	3.3
1H9	u	3.3	585	nu	2.2	805	nu	3.3	1528	n	3.3	117	n	3.3
1H0	u	3.3	586	nu	2.2	806	nu	3.3	1529	n	3.3	118	n	3.3
1H1	u	3.3	587	nu	2.2	807	nu	3.3	1530	n	3.3	119	n	3.3
1H2	u	3.3	588	nu	2.2	808	nu	3.3	1531	n	3.3	120	n	3.3
1H3	u	3.3	589	nu	2.2	809	nu	3.3	1532	n	3.3	121	n	3.3
1H4	u	3.3	590	nu	2.2	810	nu	3.3	1533	n	3.3	122	n	3.3
1H5	u	3.3	591	nu	2.2	811	nu	3.3	1534	n	3.3	123	n	3.3
1H6	u	3.3	592	nu	2.2	812	nu	3.3	1535	n	3.3	124	n	3.3
1H7	u	3.3	593	nu	2.2	813	nu	3.3	1536	n	3.3	125	n	3.3
1H8	u	3.3	594	nu	2.2	814	nu	3.3	1537	n	3.3	126	n	3.3
1H9	u	3.3	595	nu	2.2	815	nu	3.3	1538	n	3.3	127	n	3.3
1H0	u	3.3	596	nu	2.2	816	nu	3.3	1539	n	3.3	128	n	3.3
1H1	u	3.3	597	nu	2.2	817	nu	3.3	1540	n	3.3	129	n	3.3
1H2	u	3.3	598	nu	2.2	818	nu	3.3	1541	n	3.3	130	n	3.3
1H3	u	3.3	599	nu	2.2	819	nu	3.3	1542	n	3.3	131	n	3.3
1H4	u	3.3	600	nu	2.2	820	nu	3.3	1543	n	3.3	132	n	3.3
1H5	u	3.3	601	nu	2.2	821	nu	3.3	1544	n	3.3	133	n	3.3
1H6	u	3.3	602	nu	2.2	822	nu	3.3	1545	n	3.3	134	n	3.3
1H7	u	3.3	603	nu	2.2	823	nu	3.3	1546	n	3.3	135	n	3.3
1H8	u	3.3	604	nu	2.2	824	nu	3.3	1547	n	3.3	136	n	3.3
1H9	u	3.3	605	nu	2.2	825	nu	3.3	1548	n	3.3	137	n	3.3
1H0	u	3.3	606	nu	2.2	826	nu	3.3	1549	n	3.3	138	n	3.3
1H1	u	3.3	607	nu	2.2	827	nu	3.3	1550	n	3.3	139	n	3.3
1H2	u	3.3	608	nu	2.2	828	nu	3.3	1551	n	3.3	140	n	3.3
1H3	u	3.3	609	nu	2.2	829	nu	3.3	1552	n	3.3	141	n	3.3
1H4	u	3.3	610	nu	2.2	830	nu	3.3	1553	n	3.3	142	n	3.3
1H5	u	3.3	611	nu	2.2	831	nu	3.3	1554	n	3.3	143	n	3.3
1H6	u	3.3	612	nu	2.2	832	nu	3.3	1555	n	3.3	144	n	3.3
1H7	u	3.3	613	nu	2.2	833	nu	3.3	1556	n	3.3	145	n	3.3
1H8	u	3.3	614	nu	2.2	834	nu	3.3	1557	n	3.3	146	n	3.3
1H9	u	3.3	615	nu	2.2	835	nu	3.3	1558	n	3.3	147	n	3.3
1H0	u	3.3	616	nu	2.2	836	nu	3.3	1559	n	3.3	148	n	3.3
1H1	u	3.3	617	nu	2.2	837	nu	3.3	1560	n	3.3	149	n	3.3
1H2	u	3.3	618	nu	2.2	838	nu	3.3	1561	n	3.3	150	n	3.3
1H3	u	3.3	619	nu	2.2	839	nu	3.3	1562	n	3.3	151	n	3.3
1H4	u	3.3	620	nu	2.2	840	nu	3.3	1563	n	3.3	152	n	3.3
1H5	u	3.3	621	nu	2.2	841	nu	3.3	1564	n	3.3	153	n	3.3
1H6	u	3.3	622	nu	2.2	842	nu	3.3	1565	n	3.3	154	n	3.3
1H7	u	3.3	623	nu	2.2	843	nu	3.3	1566	n	3.3	155	n	3.3
1H8	u	3.3	624	nu	2.2	844	nu	3.3	1567	n	3.3	156	n	3.3



WE HAVE A FEM OUD TECHNICAL BOOKS - S.A.S.S. send 10/yr - 25 m.k.

TABLE 5 - BALLAST TUBES - \$3.00