

THE HORN SPEAKER

REFLECTIONS OF A RADIO PIONEER

This fall I had the pleasure of meeting and talking with one of the true radio pioneers, in fact, as a research man, a pioneer in many fields. One of the prize radios in my collection is a super heterodyne kit set, model 112, manufactured by Dr. John Victoreen in 1924. At this time, I had the unusual opportunity of taping a talk session with Dr. Victoreen, or "Dr. John," and of showing him my or his radio. I found Dr. Victoreen to be quite a distinguished gentleman in excellent health, very helpful and informative. It was quite a thrill listening to him tell of his involvement in the pioneering days of early radio and of his later research in many fields. I reiterate how very appreciative I am for the time Dr. John found to share some memories of the highlights of his past careers.

What follows is an edited version of our conversation:

"I was born in Pennsylvania in 1902 and started in radio at the age of 17. Being largely self-taught and always having been interested in physics, I had a fair size laboratory. I started in 1919 in a very small way before broadcasting of music and speech. I was one of the first radio amateurs to take the tests after World War I. I was very interested in vacuum techniques; vacuum and glass techniques being fields of their own. At an early age I built my own vacuum tubes.

The set you have here, model 112, became the popular set of its day, the best known kit set in the U.S. for that reason I was given the two center pages of the NEW YORK TIMES, in blue as a blue print, giving instructions on how to

put it together. Their radio department took over the editorial page for that issue and this sold quite a few part kits all over the world. Thousands of sets were made. When I designed the transformer in that set, it weighed 4 pounds. Everyone thought I was crazy to put that much iron in a transformer but it brought in low frequencies, the like of which no one else had at that time. That set had selectivity plus and would go all across the country. You could pick up California from Cleveland on that thing, which was quite a feat.

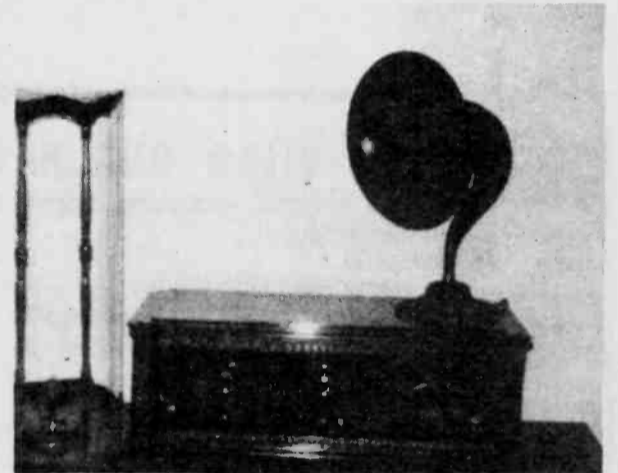
EARLY SUPERHET BUILDER



John A. Victoreen, 1975

I was one of the fellows who fought the Armstrong Superheterodyne patent. When radio kits came out R.C.A. wouldn't grant a license to make them even though they didn't know whether they owned the rights or not. R.C.A. and A.T.&T. wanted to settle this

By Ray Windrix



VICTOREEN, 112

in court, in the meantime neither one would grant any licenses, which put me in a spot. We made more superhet kits I guess than anyone else. Then R.C.A. sued my little outfit for the purpose of deciding who would be the owner of the patent. I had a chance then to go to the opposing group, A.T.&T., who offered me any of the experts from their engineering department to provide me with the information that would help me win the lawsuit. But had I won, they would have owned it and we would have been just as much in the soup. There was no real way out if two big companies of that size did have the patents on it. The long fight on the patent lasted for over 5 years. We were able to stall long enough for me to get out of the business before it came to court. We had knocked out one patent after another but the Armstrong patent hadn't been decided on when I left and Armstrong got it in the end.

I was at the first radio exposition ever given in Chicago in 1919 at the old coliseum. There would be up to

75,000 people going through in one night. For that receiver, model 112, that you have there, we shipped one and a half tons of real lithograph blue prints 35" x 24". These were given away over the counter. We hired a troupe of chorus girls dressed in tights to hand them out. By the time the doors closed that night there was literature six inches deep on the floor of that building. People would grab a piece of literature, take a look at it and throw it over their shoulder but we didn't find a single one of those prints of mine. Everyone got one of those-- they were really sought after.

Broadcast listening or

"BCL" as it was called, was the broadcast of speech and music. KEKA in Pittsburgh was the first station of this type in about 1920. Along with the set you have here, there was a power amplifier you could get, which was one of the first Hi-Fi amplifiers. When I built it, it had 450 volts center tapped on the transformer. Thordarson & Company, who built most of the transformers in those days, came all the way down from Chicago to Cleveland and said, "Are you crazy, wanting to put a 450 volt transformer in a home receiver? What do you need that for?" I came out with the first high powered-- we used big UX250s

and 251s and had power for the first time. Some were used in the first movie theaters.

It's been a long time since I have seen a set like yours but we built a variety of all types of radios. I would have really liked to have you see the final receivers, they were beautiful things. They had condenser gangs for four log rhythmic condensers 14 inches long, 8 inches wide and 10 inches high, all had ball bearings, with direct frequency on the dial in all aluminum casting. They looked like engine crank cases.

At the Victoreen Instrument Company in Cleveland, about five years ago, I saw one for the first time in about twenty years. When I got out of radio, I got out completely, I hadn't been back there since. They took me up to the Board Room and had one of my old radios sitting there, looking just like new. I wanted to make radios more scientifically and was getting more and more scientific, when the tendency was to make them cheaper and cheaper, so we had a head on clash. I was getting disillusioned, things were going by the way of cheap radios. When the crash hit our receivers sold for \$750.00, this was with turntable combinations in big beautiful cabinets. Competition was getting tough when everybody was wanting two or three cheaper radios for \$10.00 or \$15.00. I was wiped out completely in 1929 and got out of that field and into the field of physics.

I got into x-ray measurement dosimetry for cancer therapy. At that time I made just the x-ray dosimeters, first one then another variety. The company grew and grew until I sold 80% of the output of it to G.E. So I became very well acquainted with them and developed a number of things for them, which the public would never know, as it was done as a favor. I had become very close to the top management in the G.E. X-ray Corporation. For example, when they came out with automatic film processing for x-ray departments, they needed water temperature control in large volumes like five

(Continued on page 8)

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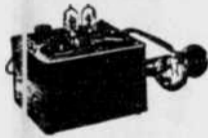
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The Horn Speaker (USPS 956120) is published monthly, except July and August by Jim Cranshaw, 9820 Silver Meadow Dr., Dallas, Texas 75217. Subscription rates are \$8.50 per

year, \$15.00 two years. Second-class postage paid at Dallas, Texas. POSTMASTER: Send address changes to The Horn Speaker, P.O. Box 53012, Dallas TX 75253.

Subscribers, advertisers, photo-

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THE ANALYSIS OF RADIO RECEIVER SYMPTOMS OPERATING NOTES

By BERTRAM M. FREED

ON the Philco 90 and 90A model receivers which have only a single-pentode output (receivers above serial No. 237,001), a very common complaint is fading and intermittent reception; the schematic circuit is reproduced in Fig. 1. An open bakelite-covered condenser of .01-mf. coupling the control-grid of the pentode tube to the type '27 A.F. amplifier preceding it, has been found to cause this condition. This unit is located at the front and right of the '27 A.F. amplifier tube socket (looking at the underside of the chassis). This condenser has three connection lugs; the unit must be replaced.

Bosch 31

Fading appears to be a common affliction with most receivers and the Bosch 31, shown in Fig. 2, is no exception—and the trouble isn't due to a defective detector tube!

There are two carbon resistors in this model that are known to cause the above complaint. The 30,000-ohm I.F. screen-grid resistor R12 is the worst offender. It will check perfectly, only to suddenly open; then, before the voltmeter or analyzer is brought into play, will return to its former condition.

When this unit is suspected, the voltmeter should be left connected to the R.F. screen-grid and the chassis, or cathode, so that the change, if any, may be noted. Perhaps, it is wiser to replace the resistor to prevent a possible future service call, as has happened to this writer, several times.

The second-detector screen-grid resistor R6, a 2-megohm unit, has caused a similar complaint, but not to the same extent for it carries much less current. An open condition of this resistor may generally

be recognized by the symptoms of muffled or mushy reproduction at low volume.

Stewart-Warner, General Motors

Many cases of distorted reproduction have been reported on the Stewart-Warner, model 102-A receiver, regardless of whether the set was operated at low or high volume. (This is the circuit erroneously marked "202" on page 202 of the OFFICIAL RADIO SERVICE MANUAL, Vol. II.)

A test showed that the tubes were not at fault; all voltages too were correct, yet the cause could not be traced. Consequently, the audio system was given the "once-over" very carefully.

After a great deal of trouble, it was noted that when the detector screen-grid voltage was checked on the 500-volt range of the voltmeter, the distortion cleared up and the volume was greatly increased. Since this move placed a 1/2-megohm resistance from detector screen-grid to chassis, (the voltmeter's resistance), a 1/2-megohm carbon resistor was soldered into this position. This cleared up a number of baffling service calls.

General Motors Model 130

Oscillation and fading on the General Motors models 130, etc., etc. (T.R.F. chassis) have been traced to badly corroded condenser-gang rotor contacts. The grid returns of the R.F. tubes are soldered to these contacts, thereby making a purely mechanical connection to the chassis instead of a good electrical one. Cleaning the rotor contacts will eliminate the condition for a short time, but the best procedure is either to solder these return leads, or to fasten them to the chassis by some secure means to prevent a recurrence. Of course, these contacts should

be cleaned in any case, or else a scraping noise will be heard as the receiver is being tuned.

OPERATING NOTES

By Adolph Kohnert

THE most difficult problems we Service Men encounter are intermittent reception, distortion, and circuit oscillation; especially when voltage, resistance and other tests reveal that all units apparently are working correctly and have the correct values.

Before going into specific cases let me explain my approach to such solutions. As a rule I find it, in most cases, best to remove both the chassis and the speaker from the cabinet. Next, put the set into operation, connect the aerial and ground, turn the chassis upside down and if possible wait until the set works abnormally as in a case of fading.

Now, in a systematic manner, pull slightly but firmly on all connections. Work either from one side of the chassis to the other side; or, start from the output tube and gradually go to the antenna input connection. For this pulling operation I use a pair of insulated, long-nose pliers; there also is required a bakelite strip with one end slotted and the other filed as illustrated in Fig. 3A. The latter tool is used when testing R.F. circuits, supplanting the pliers (which detune or stop the operation of the set).

I consider it absolutely essential to have available a diagram of the set on which you are working. Then I usually start by shunting all condensers with known good ones (having the values specified in the circuit), because very often condensers which open when "hot" will test O.K. when disconnected from the cir-

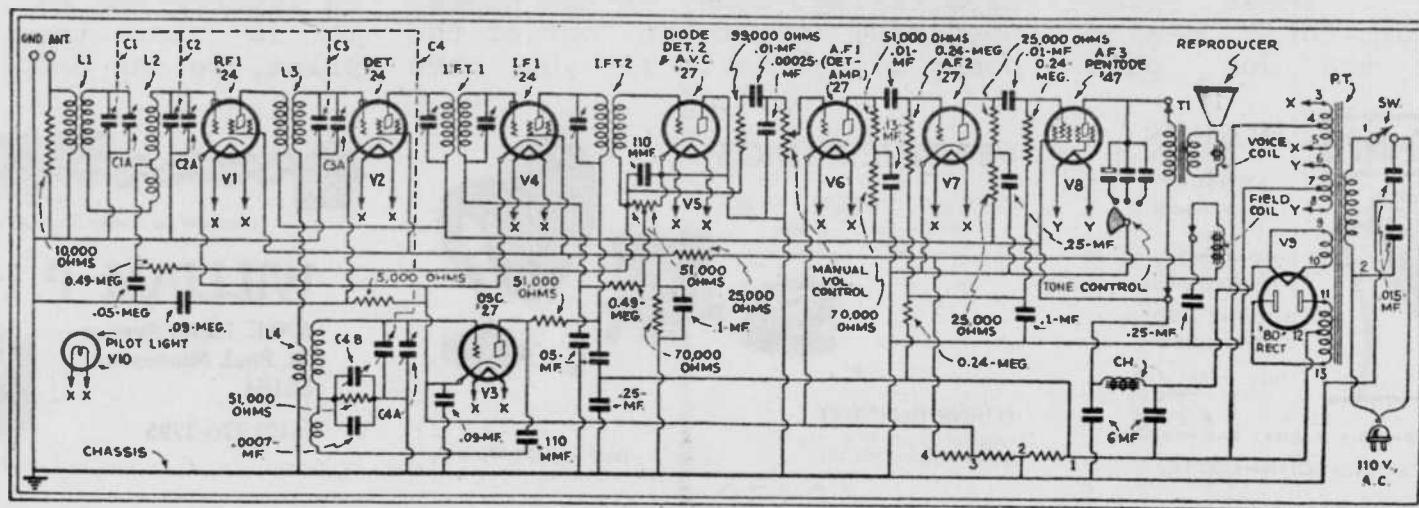


Fig. 1 Complete schematic circuit of the Philco models 90 and 90A. The condenser between the pentode grid and the '27 was open, causing fading.

BACK ISSUES

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cuit. Next to be inspected are the resistors and if these test up to par, I take the diagram and study it very closely for circuit peculiarities. What other parts I would substitute next all depends on the particular set. I shall now tell you about a few troubles I have encountered.

Philcos

The first case was a Philco 90 with type '45 output tubes; the report was "fading." All voltages tested normal but reception faded as soon as the chassis was touched, but when any test was conducted, the signal would rise to normal volume. The trouble was found in an open .01-mf. condenser, connected from detector plate to first A.F. control grid.

Another Philco set of this type played with low volume; turning the volume control did not change the volume; all voltages tested normal. The .01-mf. coupling condenser which is connected from the "detector-rectifier" output resistor to the manual volume control (whose movable arm is connected to "detector-amplifier" control-grid) was intermittently opening.

The owner of a Philco 41 D.C. reported the set slowly "dying" to a very low volume which could be brought up by turning the volume control; then, suddenly, the reception would rise to normal volume. Pulling on one of the condenser lugs would return operation to normal, only to again fade. Looking at the diagram, this condenser was found to be bypassing a 5000-ohm resistor in the detector control-grid return circuit. Replacement of the condenser solved the problem.

Many of the Philco 50 radio sets were reported to have low volume, distortion, circuit oscillation and hiss, but only after a tube was changed. The solution to this problem, which was quite a stumbling block for many Service Men, was to connect an additional .5-mf. condenser, from the movable arm of the volume control which connects to the R.F. cathodes, to the ground.

Stewart-Warners

Several Stewart-Warner 102-A radio re-

ceiver circuits "oscillated" on all stations. A check showed all voltages O.K. Resistance and condenser-short tests did not indicate any trouble. An 0.1-mf. condenser bypassing a 500-ohm cathode series resistor in the type '51 tube circuit was open and required replacement. The position of this condenser is indicated in Fig. 2B.

Low volume on a type R-102 D.C. (line) receiver was traced to an open 2 meg., 1/2-watt resistor located in the screen-grid circuit of the second-detector tube. This resistor was replaced with one of 1-watt rating.

Atwater-Kent

A great deal of annoyance was had, with an Atwater Kent 84 D.C. (line) receiver. All tests of voltages showed O.K., yet the set was playing with low volume. This set uses an I.F. "stopping" choke, which is located between the I.F. stopping condenser and one end of the volume control. The wire used is very fine; inspection showed that it had broken off close to the soldering lug.

Amrad 81

One of the most peculiar troubles regarding an Amrad 81 had to do with the complaint that after the set had been playing for three or four hours the program would start to fade. The chassis was "pulled" for shop test but during a whole week, it was impossible to make the fading condition appear. The set was brought back and the next day the customer called to report that the fading still existed! So, the set was watched, undisturbed, in the customer's house; at the end of five hours the set started to fade at one-minute intervals. Analyzer readings showed no plate voltage on the detector tube. At first it was thought to be the detector bypass condenser but when this was replaced the set still faded. So the only trouble could be the audio .5-mf. coupling condenser, which has two yellow leads coming from the bypass-condenser block. After these two leads were cut from the block and a new coupling condenser connected externally

the set behaved normally.

Another cause of fading will be found in bad solder connection on the R.F. coils: slight tapping of the coil forms will locate the trouble if visual examination fails.

Should this set hum even after the two hum adjustments are adjusted properly and the Mershon condenser found O.K. then, connect a 1-mf. condenser from the first-A.F. cathode to ground; use leads as short as possible.

OPERATING NOTES

By Joseph X. Reilly

SEVERAL of the older Atwater Kent receivers are so constructed that the chassis contains all the operating dials which are manipulated from the front of the panel through holes cut out in the panel.

On one of these receivers the volume control did not function. Upon removing the set from the cabinet, the receiver operated in a normal condition for over three hours, but refused to function after this time when replaced in its cabinet. The removal and replacement of the receiver was repeated twice to determine whether or not something was shorted to the bottom of the cabinet which is of metal. Nothing doing; the set worked normally out of the cabinet, but had very poor volume in the cabinet.

The following procedure was then followed: The chassis was placed in operation out of the cabinet and then placed in the cabinet while the set was working. This, of course, was done very slowly until the entire receiver was in its cabinet—the set still worked O. K.!

Now, one by one the bolts holding the chassis to the cabinet was placed in position, and when the first one on the right-hand side was tightened, reception ceased.

The bolt was loosened again and reception became normal. A very close inspection revealed the fact that the volume control was placed on the chassis and one of its wires was bare at the point where it entered the volume-control unit.

After this was taped and tucked away, the short to the cabinet was eliminated.

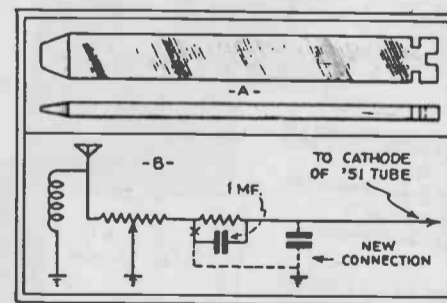
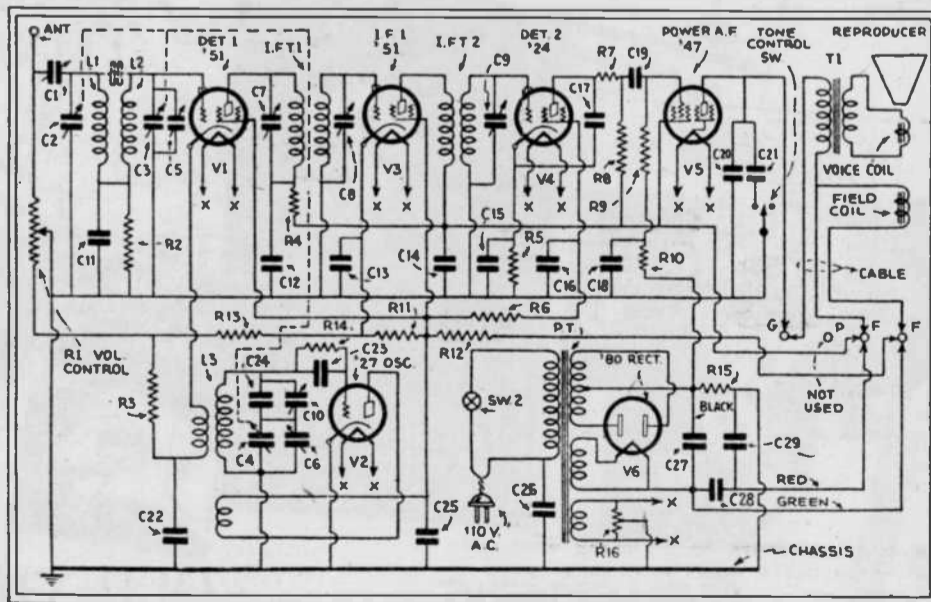
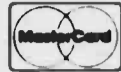


Fig. 2, left
Schematic circuit of the Bosch 31 receiver. In one case, an intermittently open screen-grid resistor, R12, caused fading. In another case, the second-detector screen-grid resistor caused similar symptoms.

Fig. 3, above
At A, the device used in the pulling operation; at B, the position of the condenser causing the trouble.

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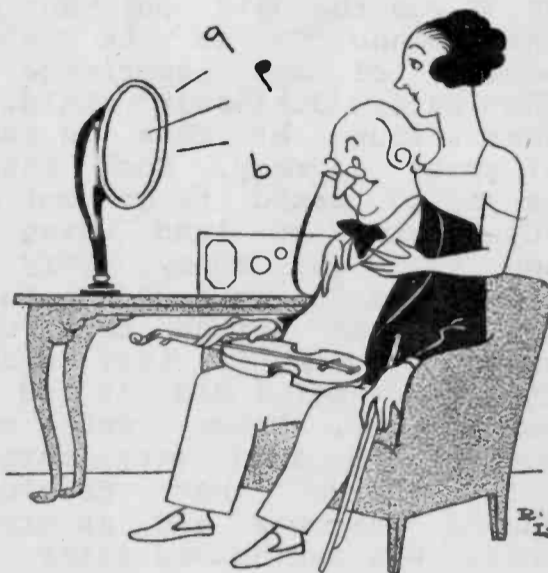
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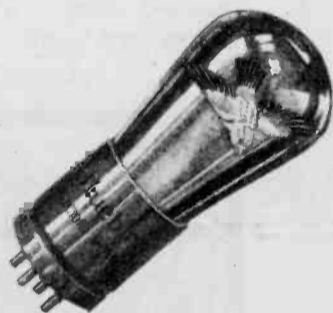
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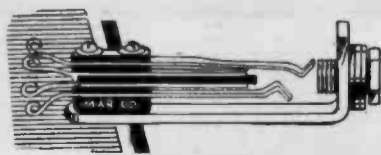


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- 16. Crystal set items - a) galena xtals \$1.45 each b) xtal detector ass'y w/xtal \$3.35 c) unmounted xtal detector ass'y without xtal \$2.00 each. --
- 17. Headphone replacement cords a) Brandes and Baldwin types \$4.25 each b) Olde tyme speaker replacement cords \$3.00 each. c) replacement pin jack tips 25 cents each or 5/\$1.00
- 18. Schematics for sets manufactured from 1920 thru 1946 \$1.50 each for complete data package \$2.50 --
- 19. Olde tyme instrument knobs 25 cents each or 5/\$1.00
- 20. Olde tyme dial plates 25 cents each or 5/\$1.00 ---



- 21. Olde tyme phone jacks \$1.00 each. --
- 22. Fahnestock clips 15 cents each or 8 for \$1.00 --

35. JUST ARRIVED -- TWO BEAUTIFUL PATTERNS OF GRILLE CLOTH. WRITE FOR FREE SAMPLES. WE NOW HAVE AN AMPLE SUPPLY. COST IS \$3.25 PER SQUARE FOOT. --

36. Olde AC plugs at \$1.10 each or 3 for \$2.95

37. NEW SCREW BASE CAPS 40 MFD X 40 MFD 450V \$3.00 EACH OR 2 FOR \$5.00

OLDE TYME RADIO SHIPPING POLICY. WE REQUEST THAT OUR CUSTOMERS SEND SUFFICIENT FUNDS TO COVER SHIPPING COSTS. OVERAGES IF UNDER \$1.00 WILL BE CREDITED TO FUTURE ORDERS -- OR REFUNDED IF REQUESTED. OVERAGES IF OVER \$1.00 WILL BE RETURNED WITH ORDERS WHEN SHIPPED. OLDE TYME RADIO STRIVES TO FILL ALL ORDERS WITHIN 48 HOURS AFTER RECEIPT. WHEN ITEMS ORDERED ARE OUT OF STOCK THE ORDER WILL BE ACCEPTED AND THE CUSTOMER NOTIFIED AS TO WHEN HE CAN EXPECT DELIVERY UNLESS THE ITEM IS NO LONGER AVAILABLE IN WHICH CASE HIS MONEY WILL BE REFUNDED. ALL ORDERS WEIGHING 6 OUNCES OR LESS ARE SHIPPED U. S. MAIL. ORDERS WEIGHING OVER 6 OUNCES ARE SHIPPED U.P.S. UNLESS THE CUSTOMER DIRECTS OTHERWISE. WHEN MAKING AN INQUIRY PLEASE INCLUDE AN S.A.S.E. PHONE AFTER 7:P.M. E.S.T. (301) 585-8776.

gallons per minute over tremendous ranges of hot and cold water intake to be held to a half a degree in output. This was something no one could do. They asked me if we could do it. I didn't know if we could do it or not but I tried and found that we could.

I made one of the first electronic stethoscopes in the U.S. for G.E. We made a good one but it turned out to be the wrong thing to do as I had warned them. No doctor wanted to admit that he had a hearing problem. So we couldn't sell them to doctors, which we thought would be the market for them and it just died a natural death.

Having my sales outlet through G.E. we worked very well together. When the war broke out, I was then the only manufacturer of radiation measuring instruments in the world, so my company became one of the first prime contractors for the A-Bomb project. We were involved in the A-Bomb project

even before the Army. My little company may have been small but it was all they had and I guess we did as well as anybody else in those hard times. We were set up in Cleveland under a secret contract to manufacture vacuum tubes and instruments to measure radiation in the field by the Army, Navy and Air Force in case the bomb was dropped on us. I was the only one who had the technology on the subject because of our experience in the x-ray dosimeter field. I went through all this in times of great secrecy. Such things as being asked to go out and buy a piece of land using my own name and money. Very few people would have done that, and it was agreed that they would act as if they didn't even know me. I did it and it worked out. There were some complex and some very threatening things that developed during the war and naturally there was one hazard after another but I went through it-- not without nearly being a

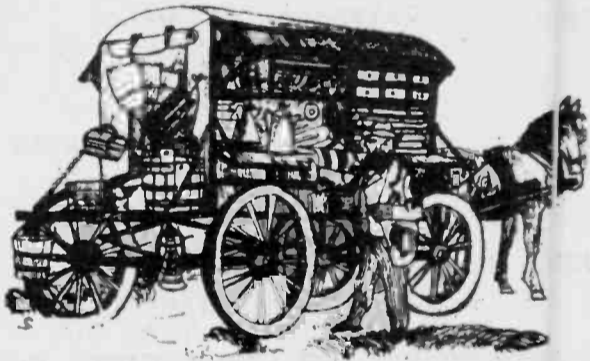
nervous wreck. I have been asked to write a book about my experiences on that subject but that's one story I'll never tell.

I was interested in truly scientific things that radio didn't quite satisfy. When the war was over my company built all the commercial radiological instrumentation for the Bikini Bomb test. We built it all. There were two box-car loads and one C-47 plane load that we had to make in a matter of 7 weeks. All this had to be developed from scratch as they had never been built before. After the A-Bomb project a Cleveland University gave me an honorary doctorate for the things I had done on that project. Of course one rarely uses such a title, but I became, nevertheless, affectionately known to most people as "Dr. John."

I came to Colorado Springs in 1950 and stayed until 1962. I joined the staff at the Medical Center as consulting phy-

(Continued on page 10)

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 - 7152 Diagonal
 - 7153 Needle Nose
 - 7154 End Cutting Nipper
 - 7155 Bent Nose
 - 7151 Long Nose w/Cutter
- 4.50**

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club news

HOUSTON VINTAGE RADIO ASSOCIATION

Show Announced

Unless something comes up, the 1982 HVRA Annual Show and Auction will take place at Gulfgate Mall in Houston on Saturday, May 29. Finalization of the date and time will be established at the March meeting. At the February meeting, contest chairmen and assistants were determined. Contest Chairman is Frank Cooper, Show Chairman is Wendell Wyborny, Publicity Chairmen are Duie Roth and Maury Zivitz, Security Chairman is John Mohundro, and Auction Chairman is Gary Coplin.



THE
ANTIQUÉ RADIO CLUB OF ILLINOIS
AN AFFILIATE OF
THE ANTIQUÉ RADIO CLUB OF AMERICA
IN CO-OPERATION WITH
THE INDIANA HISTORICAL RADIO SOCIETY
AND
THE MID-AMERICA ANTIQUÉ RADIO CLUB
PRESENTS

RADIOFEST '82
AUGUST 7, 1982 at the HOLIDAY INN, 345 RIVER BLUFF RD.,
ELGIN, ILL. (Route 31 South exit from the I-90
Northwest Tollway)

THE PROGRAM

- I. ALL DAY SWAP-SELL SESSION
- II. SEVERAL TECH SESSIONS INCLUDING: RESTORING RADIO CABINETS
- III. RADIO CONTEST--CATAGORIES:
CLASS I--A.C. RECEIVERS
CLASSII--BATTERY RECEIVERS
CLASSIII--CRYSTAL SETS
CLASS IV--HORN SPEAKERS
CLASS V--HOMEBREW RECEIVERS
CLASS VI--TUBES
CLASS VII--ADVERTISING
FIRST, SECOND, AND THIRD TO BE AWARDED IN EACH CLASS PLUS
BEST CF SHOW. CONTEST ENTRIES MUST BE IN CONTEST ROOM BY
11:00 A.M.
- IV. SATURDAY AFTERNOON: TOUR RALPH MUCHOW'S FANTASTIC MUSEUM
- V. SATURDAY NIGHT: BANQUET AND AWARDS PRESENTATION PLUS AN INTERESTING PROGRAM.

REGISTRATION: PRE-REGISTRATION \$2.00--REGISTRATION ON THE DAY OF MEET \$3.00
BANQUET TICKETS: \$ 9.75
MOTEL ROOMS: WE HAVE GUARANTEED 20 ROOMS WITH A 10% DISCOUNT--CONTACT THE HOLIDAY INN AT THE ABOVE ADDRESS OR CALL 312-695-5000 and request reservations for: THE ANTIQUÉ RADIO CLUB OF ILLINOIS MEET IN AUGUST

STAY OVER SUNDAY AND ATTEND THE SANTA FE HAMFEST (ONE OF THE LARGEST IN THE COUNTRY) DIRECTIONS AT THE MEET

YES, I PLAN TO ATTEND THE MEET
YES**NO** I PLAN TO ATTEND THE BANQUET
MAKE BANQUET AND PRE-REGISTRATION CHECKS TO: ARCI AND SEND TO: JOE WILLIS--525 OAKDALE #524--CHICAGO, ILL. 60657
IF POSSIBLE, PLEASE REPLY BY APRIL 30th.

WANTED:

sicist and also at Memorial Hospital, helping them build their isotone department.

Being interested in audio and audio power amplification and frequency response, etc., I ended up in today what is my field, otometry. You could say that I am the "Father of Otometry." I have written three books on the subject, which have to do with prosthetic hearing instruments for hard of hearing people. My work in the audio field of radio has given me the background I need to solve the problems and needs of the otometry field. I gave at least four seminars per year on prosthetic applications of hearing instruments. I was a pioneer in radio and am just as much a pioneer in this field, because I stand for change; but people seem to want the status quo. The three books I have written on otometry are BASIC PRINCIPLES OF OTOMETRY, HEARING ENHANCEMENTS IN THE 60'S and I have one coming up shortly, one titled HEARING INSTRUMENT DISPENSING BY PRESCRIPTION. I am trying to promote the use of prescription with the whole hearing industry violently opposed to this ever coming about, because then they would have to make things right and guarantee them. Neither of these things do they want.

I am now doing research as Victoreen Laboratory in Maitland Florida. The former company, Victoreen Instrument is still in Cleveland but has been expanded so many times that I am completely out of it. I am not so much a businessman as a research man."

As told to a radio collector, Ray Windrix, in 1976.

CLASSIFIED

AD RATE: 10 cents per word
20¢ per word for nonsubscribers

Photo ads: \$5.00 extra

DEADLINE: 20th of the preceding month

List ads - 35 cents per line

AD SPACE:

Full page.....\$65.00

Half page.....\$35.00

Quarter page..\$20.00

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FOR SALE: CATHEDRAL, BATTERY and AC RADIOS from 1920's and 1930's. Please send self addressed stamped envelope. J. Albert Warren, Box 279, Church St., Waverly, PA 18471.

OLD RADIOS, SPEAKERS, TUBES,

RIDER, RCA, PHILCO, ZENITH SERVICE MANUALS, PARTS, TEST EQUIPMENT PLUS MORE -- KRANTZ, 100 OSAGE AVENUE, SOMERDALE, NJ 08083.

PHOTOCOPIES OF SALESMAN'S BROCHURE with pictures and specifications for all 42 models of 1937 Zenith radios. \$6.00 ppd. Scott Rodkey, 2209 Stone Post Road, Manhattan, Kansas 66502.

"WUNDERLICH TUBE, 1001 Q & A RADIO NEWS VOL. I & VOL. II \$30 FOR BOTH, LORD CALVERT 4 TUBE RADIO \$175.00. CROSLY TRIRDYN P. 81 V. R. \$90.00. MANY ARCTURUS BLUES. SASE. W6THU, 1545 RAYMOND, GLENDALE, CA 91201"

FOUR- WESTON TYPE 425- 3 1/2" SURFACE MOUNTED R. F. THERMO-AMMETERS. ONE 0- 5 AMP. THREE 0- 10 AMP. \$25.00 EACH PLUS POSTAGE. ED ROSSIG, BOX 33, NEW MARKET, MD 21774 (301) 865-3313

WILLARD RADIO BATTERIES, 24 tube cells; new old stock \$40.00 each. FEDERAL 417, NO CABINET, 15" X 17" \$150.00. EDISON AUTOMATIC REPRODUCER, EXCELLENT REPRO WEIGHT \$75.00. W.E. THEATER PROJECTOR FROM PARAMOUNT STUDIOS, CIRCA 1932 \$750.00. 1930'S RECORDING LATHE \$75.00. RARE CYLINDER AND DISC RECORD AUCTION LISTS. WALLY WOOD, BOX 8153, LA CRESCENTA, CA 91214. (213) 246-1225.

I HAVE A Philco "Super Heterodyne 7" cathedral, table-top radio for sale. (15 1/2 wide X 18 1/2 X 10" deep) Complete but not playing. I want to sell it. David A. Radke, 731 Sherwood, La Grange Park, IL 60525

GOOD HORNS: A-K MODEL L \$85.00. RADIOLA UZ-1325 \$75.00. RADIOS AND RECORDS. SEND S.A.S.E. TO ARTHUR HARRISON, 1021 FALCON DRIVE, COLUMBIA, MO 62501.

FOR SALE- RIDER MANUALS, RADIO AND TV. RADIOS- BATTERY AND AC CATHEDRALS. SEND S.A.S.E., CLARENCE STEVAHN, P. O. BOX 576, WISHEK, ND 58495. (701) 452-2790.

FOR SALE: RCA Art-Deco style lamp- radio. Plays and looks good - \$100. Also, Bell Telephone Technical Journals 1920's to 1960's, virtually complete set- \$200. or b.o. Alan I. Zelazo, 6 Edsonia Terr., West Orange, NJ 07052. Tel. (201) 325-9223.

TUBES, NEW AND USED, FOR EARLY ELECTRIC RADIOS. SASE FOR FREE PRICE LIST. SAM FAUST, CHANGE-WATER, NJ 07831.

CASH FOR DECEMBER 1915 TO DECEMBER 1921 QST'S FOR PERSONAL COLLECTION. KEN MILLER, K6IR; 16904 GEORGE WASHINGTON; ROCKVILLE, MARYLAND 20853. (301) 774-7709.

WANTED: SCOTT PHILHARMONC. Prefer Napier console. Dick Howe, 9318 Wickford, Houston, TX 77024 or call (713) 680-9945 collect.

WANTED: INDIVIDUAL RADIO REPAIR AND SERVICE MANUALS FROM 1930 TO 1950 FOR G.E., PHILCO, ZENITH, AIRLINE, CROSLY, SILVERTONE, STEWART WARNER, EMERSON, AND R.C.A. INTERESTED IN ANY QUANTITY. SEND PRICES. CHARLES TEAGUE, 330 SEMINOLE, BOULDER, CO 80303

HI-FI, TAPE, AUDIO, and retail magazines and brochures: 1945-55 only; Precedent FM tuner; early 1950's transistor sets. H. Layer, AV-SFSU, 1600 Holloway, San Francisco, CA 9412.

I PAY MORE FOR MIRRORED GLASS RADIOS (BLUE, PEACH). BOB, (305) 628-8755. P. O BOX 312, WINTER PARK, FLORIDA 32790.

WANTED: T.V. GUIDES. ESPECIALLY PRE-1970. ALSO WANT ALL TYPES OF OCEAN LINER MEMORABILIA. DESCRIBE AND PRICE. RICHARD HEBERT, BOX 603 AUBURN, NY 13021.

WANTED: 1923 OR EARLIER RADIO NEWS, Science and Invention, Modern Electrics, Any pre 23 mags or catalogs. Also any Grebe receivers or amps. Also need HZ. Ray Garner, Rt. 1, Box 320, Big Sandy, TN 38221.

WANTED: UNRESTORED AK 82 AND 80. MUST BE COMPLETE. NOVAK. 4138C PATRICE, NEWPORT BEACH, CA 92663.

WANTED- ADAPTER # 615 OR OTHER adapters for Eicc tube tester model # 666 & 667. Also latest tube chart. Frank Hoffert, 19605 Chardon Road, Cleveland, OH 44117.

*)\$50 REWARD for xerox of manual for c.1969 Air Force VLF SIGNAL SIMULATOR. Contact#: FO-9603-69-C-0571. Part#: 11045. H. Layer, AV-SFSU, 1600 Holloway, San Francisco, CA 94132.

WANTED: INFORMATION ON EV-RALAB, Evansville, Indiana 1922 and ELMCO, Indianapolis, IN 1922. James Fred, Cutler, IN 46920

This Month's Bargains From ARS

ARS Electronics
646
Kenilworth Terr.
Kenilworth, IL
60043

HERE ARE OUR FEATURED ITEMS FOR THIS MONTH. THESE ARE BEING OFFERED AT SPECIAL SAVINGS FROM OUR REGULAR CATALOG PRICES JUST FOR READERS OF THIS PUBLICATION.

- Assortment of 10 Sams packets, usually \$10. \$5 here.
- Special section to Rider Radio #4 (1934) circuits and info. \$3 regular. \$1 here.
- Ten pounds of technical booklets, magazines and servicing info. Just \$3 now.
- A pound of old printers type. \$3 regularly. \$1 here.
- Tube caddy. Holds up to 100 tubes. \$9 regularly, \$5 here.
- Roof heater cable, melts ice & snow. Usually \$4. Now \$2.
- Remington Standard Model 12 typewriter. Very early model. Normally \$35. Now \$25.
- Auto FM booster, 12 VDC. \$4 in catalog. \$2 here.
- Automobile rear window defogger. 12 VDC. \$2
- Automobile burglar alarm - shaker & delay. \$2 usually. \$1 now.
- Relistic AM-FM car radio. 12 VDC. \$8 normally. \$5 now.
- Supreme Auto Radio Manual, normally \$2.50. Just \$1 for this sale.
- Transistorized microphone mixer (4 mics.) Usually \$2. Now \$1.
- AC line cords 4 for \$1.
- Assortment of five meters (amps, VU, decibels, pressure, etc.) Just \$4.
- 10 Assorted volume controls. Regularly \$1.99, now just 99c.
- 10 Assorted switches - usually \$1, now 20 switches for \$1.
- Old Transformer. 117 VAC in. Out: 100, 6.3, 16.3, 5 VAC @ .3A, 145, 6 VAC @ .4A. 15 VAC @ .26A. \$19 in catalog. \$14 here.
- Sams set 50-500 with missing or partially missing folders. Good starter set. Lists for \$75 in catalog. \$40 here while it lasts.
- Riders master TV index. \$7 in catalog. \$2 here.
- Riders volume 21 radio. \$50 in catalog. \$40 here. (only one left)
- Practical Radio and Electronics Course Vol. I, II, III, damaged. Usually \$9. \$4
- Riders "How It Works" TV or Radio. \$25 each in catalog. Both for 25c here.
- Five pounds of electronic parts - relays, motors, solenoids, etc. Now \$4
- Microphone stands normally \$1 each or two matched for \$3. Now pairs are \$1.50
- Supreme Publication's Master Index lists for \$10 in catalog. \$6 here.
- Rider Radio complete index-1-23, photocopy. Normally \$25. Special price of \$19.
- Five Speakers Normally \$7. Now just \$4 (good range of sizes)
- Coloring, Finishing and Painting Wood, Newell 1930. Was \$7. Just \$4 here.
- 100 AMP Arc Welder, 220 VAC. Complete, brand new. With supplies. \$90 + shipping.

ARS Electronics
646 Kenilworth Terrace
Kenilworth, IL 60043

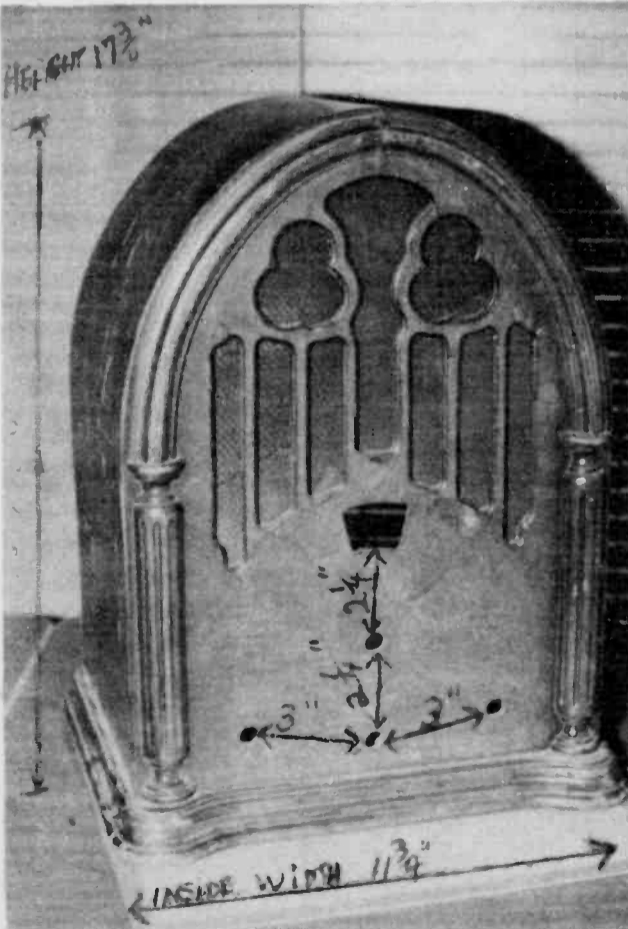
ARS GUIDE TO FINDING SERVICING INFORMATION. This book-let helps determine the age and manufacture of sets. Sources of servicing information are identified. A great help to collectors and restorers of old sets. \$2

DIRECTORY OF ANTIQUE RADIO COLLECTORS AND SUPPLIERS. The most complete listing of those involved in antique radio. Separate sections listing collectors by state, foreign, publications, clubs, museums, and libraries carrying old radio information. Be sure you're included - indicate on the order form! \$4

CATALOG
Check here if you would like to receive the next catalog when it is available. Please include two FIRST CLASS stamps of 40c to cover costs. Thanks.

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TAKE ADVANTAGE OF THESE LOW PRICES WHILE THEY LAST. YOUR ORDER MUST TOTAL AT LEAST \$10. NO DISCOUNTS ALLOWED. ALL ITEMS SUBJECTS TO PRIOR SALE OR WITHDRAWAL FROM THIS SALE.



PLEASE HELP: I need a chassis and speaker for this cathedral cabinet. I will except chassis without speaker. I also need a Philco Model 20 cabinet. Thank out. Joe Beach, 6515 Sunset,

Garden City, MI 48135 (313) 261-7965.

WANTED/NEEDED TO COMPLETE SEVERAL PROJECTS -- SCHEMATICS: "Supreme" Set Analyzer Model 385- Automatic; Fada Type "Q" Eliminator; Bremer- Tully A-B Eliminator; Most any "Supreme" Test Gear. HARDWARE: Silver Marshall Plug-In Coil Sockets (w/ Keyway); Flat Coil Mounting strips; Coil Forms, Plug-In Type, 4 & 5 Prongs; RFCs, Early Types; DSC, DCC, Enamelled Coil Wire, All Guages. COMPONENTS: Remler "Infradyne" Amplifier Unit, #700; Bremer- Tully AF Xfrms.; AF Xfrms.: Karas, Madison- Mocre, Sickles, Victoreen; Coils.; Cplng., RF, IF: Victoreen, Madison- Moore, Celco, etc. Nat'l. "vk" Dial Assy.. If you have the loot, I have the cash. Xerox copies of schematics are quite acceptable. If you have several of the above, feel free to call me collect anytime after 6 p.m. PST at (415)UK:6-1885. Dan O'Meara, G.P.O. Box 521, Palo Alto, CA 94302

I AM LOOKING FOR AN INSTRUCTION MANUAL FOR A SUPREME MODEL 385 AUTOMATIC TESTER. If you could recommend a possible source for

same please advise. Richard Lindner, Box 34, Plainfield, IA 50666

WANTED: CROSLY GRANDFATHER CLOCK RADIO. PLAYTIME JR. 141, RONNIE KACZMAR, 5747 WILLIAMSON, DEARBORN, MICHIGAN 48126

Wanted: 1926 THOROLA "DUAL DIAPHRAGM" SPEAKER in excellent working condition for 1926 "Nine in Line" Super. Also need loop with 7" turning radius. Would like to correspond with collectors in Georgia. Ed Hall, 1810 Monroe Drive, NE, Atlanta, Georgia 30324

WANTED: 3 TUBE COVERS FOR NEUTROWOUND OR TO CONTACT SOMEONE WHO CAN MAKE THEM. GREBE CR SERIES AND AMPS. BRASS BASE TIP TOP TUBES. PARTS FOR BC312 OR ANY BREADBOARD PARTS. POSTAGE REFUNDED IF NO DEALS MADE. THANK YOU. RAY GARNER, RT. 1 BOX 320, BIG SANDY, TN 38221

WANTED TO BUY: EXCELLENT WORKING CONDITION Radiola Model 17. Will pay top price. All letters answered. Will pay shipping and packing. Ron Burtzos, 915 Crane Dr. Apt. #703, DeKalb, IL 60115.

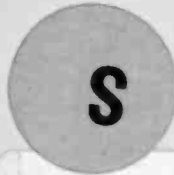
APRIL

THE HORN SPEAKER

1982



A MESSAGE FROM EUROPE!
Scene: a lonely shack on the beach at 2 a. m. The operator (according to the romantic popular idea) sits with the telephones pressed to his ears and a strained expression on his features. When a call comes, he scribbles feverishly



R O HILL
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BEAVER FALLS
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PUETT ELECTRONICS
PUBLISHERS OF
ANTIQUE RADIO TOPICS &
LIST NO. 20 THE CLASSIC RADIO NEWSLETTER

P.O. BOX 28572 DALLAS TEXAS 75228

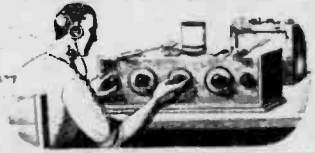
NOTE: PLEASE ORDER BY CATALOG NUMBERS LISTED HEREIN. EXAMPLES: 1837, 1838, 1994. ORDER BY DATE NUMBER.

ANTIQUE RADIO TUBES

ALL TUBES ARE THOROUGHLY TESTED AND GUARANTEED. SEE DETAILS IN CATALOG NO. 20.



042	55	1N4	50	2A4	51	6AS	57	6B8	57	6J8	55	6SR7	55	7B5	55	7CA4	55	7SN7	55	7SA6	55	30	58	21	601	55
043	55	1N4	50	2A5	51	6A6	57	6B7	57	6C5	55	6SS7	55	7B6	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	602	55
044	55	1N4	50	2A6	51	6A7	57	6B8	57	6C6	55	6S7	55	7B7	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	603	55
083	55	1J5	50	2A7	51	6A8	57	6B9	57	6C7	55	6S8	55	7B8	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	604	55
0C5	55	1J6	50	2B7	51	6A9	57	6B9	57	6C8	55	6S9	55	7B9	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	605	55
0D5	55	1L4	55	2E5	51	6A5	57	6B6	57	6C4	55	6S0	55	7C0	55	7CA8	55	7SN7	55	7SA7	55	30	58	21	606	55
0V9	55	1L6	51	2W3	53	6A87	57	6C4	55	6L6	55	6T7	55	7C7	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	607	55
0Z4	55	1L44	57	2X2	53	6A5	57	6C5	55	6L7	55	6T8	55	7C8	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	608	55
1A3	55	1L46	57	2A4	53	6A7	57	6C6	55	6L8	55	6T9	55	7C9	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	609	55
1A4	55	1L47	57	2A5	53	6A8	57	6C7	55	6L9	55	6T0	55	7C0	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	610	55
1A5	55	1L48	57	2A6	53	6A9	57	6C8	55	6L0	55	6T1	55	7C1	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	611	55
1A6	55	1L49	57	2A7	53	6A0	57	6C9	55	6L1	55	6T2	55	7C2	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	612	55
1A7	55	1L50	57	2A8	53	6A1	57	6D0	55	6L2	55	6T3	55	7C3	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	613	55
1B1	55	1L51	57	2A9	53	6A2	57	6D1	55	6L3	55	6T4	55	7C4	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	614	55
1B5	55	1L52	57	2F4	57	6A27	57	6D2	55	6L4	55	6T5	55	7C5	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	615	55
1B7	55	1L53	57	2F5	57	6A28	57	6D3	55	6L5	55	6T6	55	7C6	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	616	55
1B9	55	1L54	57	2F6	57	6A29	57	6D4	55	6L6	55	6T7	55	7C7	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	617	55
1C6	55	1L55	57	2G5	57	6A30	57	6D5	55	6L7	55	6T8	55	7C8	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	618	55
1C7	55	1L56	57	2G6	57	6A31	57	6D6	55	6L8	55	6T9	55	7C9	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	619	55
1D1	57	1M6	51	2A72	51	6A32	57	6D7	55	6L9	55	6T0	55	7C0	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	620	55
1D2	57	1M5	50	2A71	51	6A31	57	6D8	55	6L0	55	6T1	55	7C1	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	621	55
1D3	57	1M4	50	2A70	51	6A30	57	6D9	55	6L1	55	6T2	55	7C2	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	622	55
1D4	57	1M3	50	2A69	51	6A29	57	6D0	55	6L2	55	6T3	55	7C3	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	623	55
1E4	50	1R4	50	2A68	51	6A28	57	6D1	55	6L3	55	6T4	55	7C4	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	624	55
1E5	50	1R5	50	2A67	51	6A27	57	6D2	55	6L4	55	6T5	55	7C5	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	625	55
1E7	50	1R3	50	2A66	51	6A26	57	6D3	55	6L5	55	6T6	55	7C6	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	626	55
1F4	50	1R2	50	2A65	51	6A25	57	6D4	55	6L6	55	6T7	55	7C7	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	627	55
1F5	50	1R1	50	2A64	51	6A24	57	6D5	55	6L7	55	6T8	55	7C8	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	628	55
1F7	50	1U4	50	2A63	51	6A23	57	6D6	55	6L8	55	6T9	55	7C9	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	629	55
1G4	50	1U1	50	2A62	51	6A22	57	6D7	55	6L9	55	6T0	55	7C0	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	630	55
1G5	50	1V	50	2A61	51	6A21	57	6D8	55	6L0	55	6T1	55	7C1	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	631	55
1U6	50	2A5	51	6A20	57	6D9	55	6L1	55	6T2	55	7C2	55	7CA7	55	7SN7	55	7SA7	55	30	58	21	632	55	632	55



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