

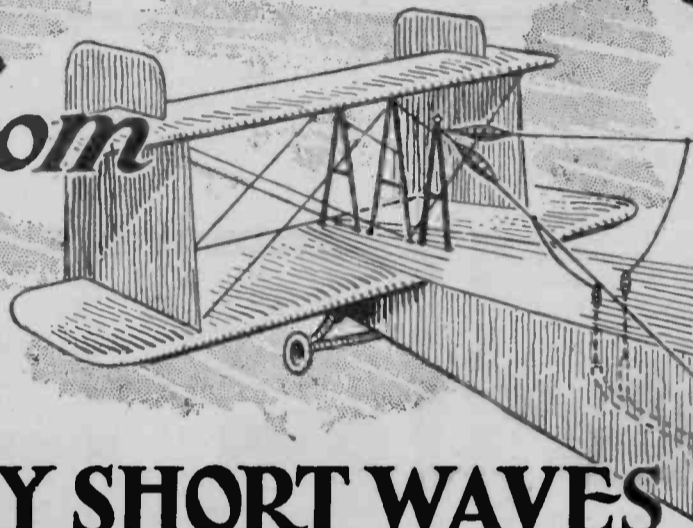
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THE NEWSPAPER FOR
THE HOBBYIST OF VINTAGE
ELECTRONICS AND SOUND

138

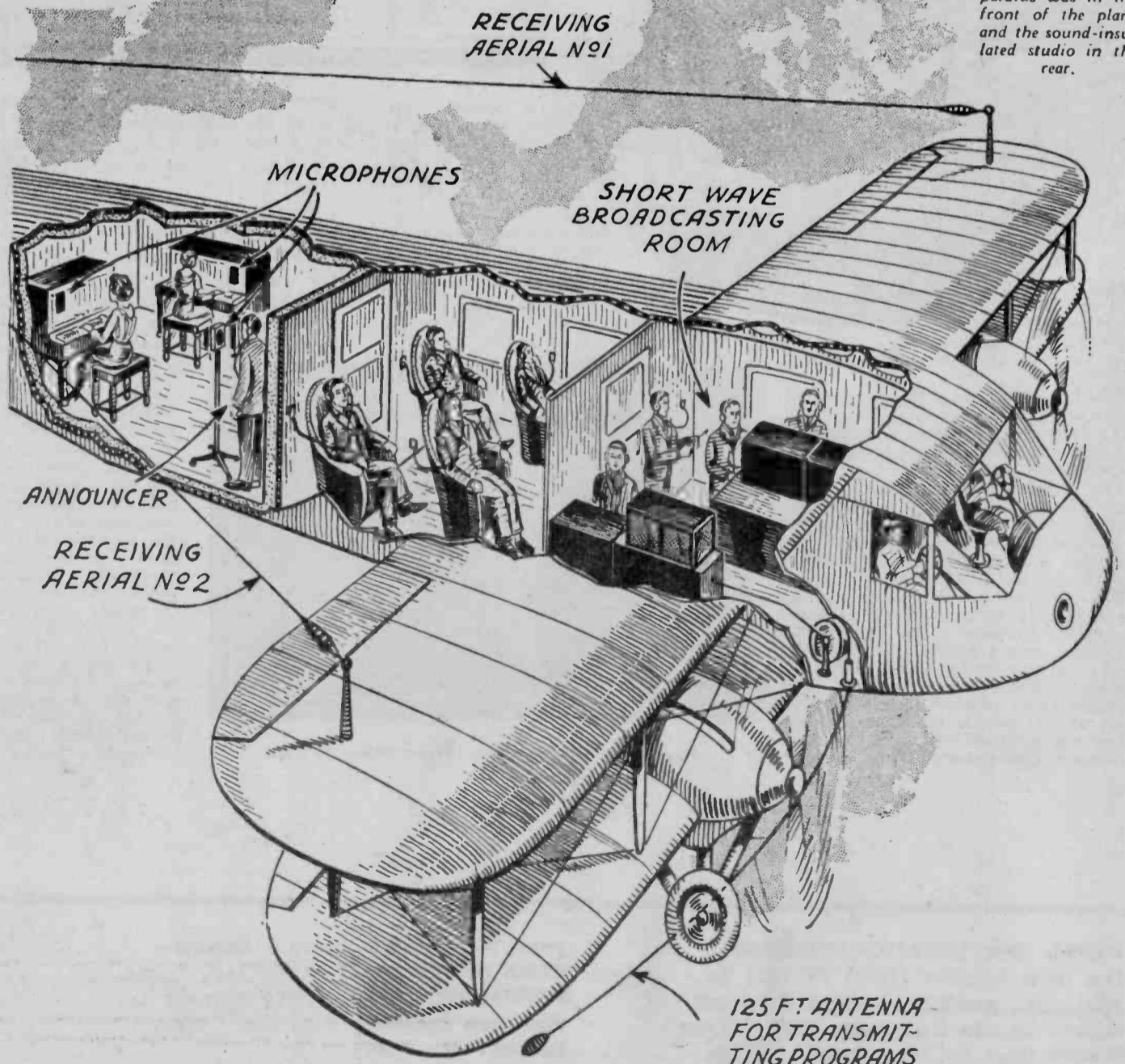
July, 1932 SHORT WAVE CRAFT

MUSIC *from* THE AIR BY SHORT WAVES

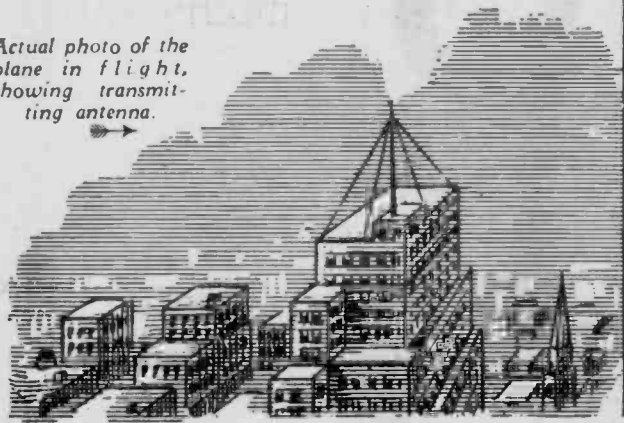


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The short wave apparatus was in the front of the plane and the sound-insulated studio in the rear.



Actual photo of the plane in flight, showing transmitting antenna.



compartment to help isolate any noise between the control room and the studio.

The studio, located in the rear compartment of the 58-foot long cabin, in order to be as far from the motors as possible, was entirely covered with ozite of three-inch thickness, heavily draped and carpeted. The two pianos used were of the small, "night-club" type, and the actual pick-up was made by suspending dynamic microphones inside the pianos. John Mayo, the announcer who worked in the studio with the piano team, was equipped with a special close-talking aviation type microphone. From this description it is evident that every possible precaution was taken to eliminate any outside noises whatsoever.



In order to accomplish the two-way conversation which was carried on during the program between Mayo on the plane and Paul Douglas at the Columbia Building in New York, Mayo was

equipped with ear-phones, through which he monitored the entire program, including the conversation from the ground station. The pilots who made the trip were also equipped with ear-phones so that they could hear the entire program as it was broadcast over Columbia's New York station, WABC.

Including pilots, performers, engineers, and non-participating guests, thirteen persons in all made the flight.

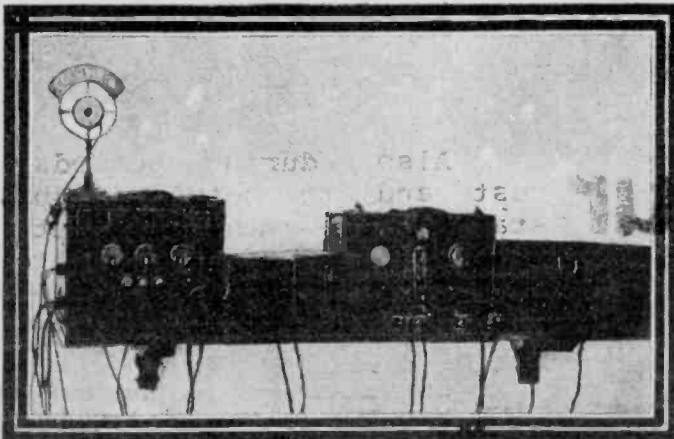
The ground point layout, while not quite so intricate as the plane installation, still presented many problems, due to its location, on the roof of the Columbia Broadcasting System Building at 485 Madison Avenue, on the corner of 52nd Street, New York, in the midst of a number of metropolitan television and short-wave transmitters.

Three different types of short-wave receivers with specially tuned antennae and wave-traps formed a diversity system, being fed through a mixer and amplified so that perfect transmission from the plane could be depended upon at all times. Thus any objectionable fading was successfully eliminated. The reception was then amplified and transmitted by wire through the master-control room to the studio control room, at which point the ground announcer was located. The program, after passing through the studio control room equipment, was transmitted back to master control, over the regular facilities associated with that particular studio, and then to the entire network. At the same time, the program was sent back from the master control room to the station on the roof of the building, at which point it was transmitted over another portable short-wave station, W2XDY, transmitting on 194 meters, so that the engineers and the announcer in the plane would be sure to receive their "cues," in the event that their reception of WABC faded during the broadcast. This double assurance was provided so that, in the event of difficulties, the rest of the network would not suffer the loss of the program.

The diagrams furnished with this article show a complete layout of equipment as installed at both points. The installation of all the equipment was actually made twice, as a complete "dress rehearsal" of the program was made ten days prior to the actual broadcast. In the interim the plane was put back into regular passenger service on its E. A. T. run between New York and Atlanta.

A NOVELTY in aviation broadcasts was accomplished on May 2, when Sandra Phillips and Peggy Keenan, red-headed two-piano team, presented their "Piano Pictures" program over WABC and the entire Columbia coast-to-coast network from an airplane hovering above New York at an altitude of 10,000 feet. As well as the music of their two pianos, a two-way conversation between the plane and a ground point was in-

ly modified to pass all frequencies within the musical range. The power supply for the transmitter was furnished from a 1250-volt dynamo which was driven by a 12-volt bank of storage batteries. Inasmuch as the drain on the batteries was quite heavy, it



Speech input and three short wave receiving sets at "ground" station.

was necessary to float them across a 50-ampere generator. A quarter-wave trailing transmitting antenna, 94 feet long and weighted at the end, was dropped through the floor of the cabin. The

One of the greatest short wave broadcasting stunts ever staged was recently accomplished successfully over the "Columbia" network, when a giant eighteen-passenger Curtiss Condor plane flew over New York City carrying entertainers, whose concert performed aboard the plane was picked up by short waves. The broadcast was then amplified by the ground station and fed to the network.



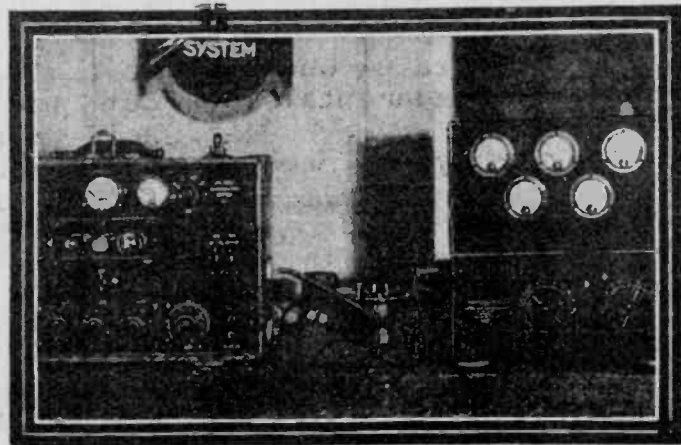
Sandra Phillips and Peggy Keenan, whose piano duet was broadcast by short waves from a plane in flight.

cluded as part of the broadcast, which marked another achievement in unusual short-wave broadcasts for Columbia.

It will no doubt be of interest to readers to know how this was accomplished, and a technical description and engineering diagrams disclosing the methods employed follow.

Two things were essential; first, to equip the plane with a miniature broadcasting station and studio; and, second, to equip a suitable ground point for the reception of the airplane transmission and the location of the "cueing" station.

The airplane, which was piloted by the highly capable A. P. Kerr, Assistant Operations Manager of the Eastern Air Transport, was a giant 18-passenger E. A. T. Curtiss Condor, powered by two 625-horsepower Conqueror motors. This alone offered a problem from the standpoint of motor-noise interference. The plane was equipped with a portable 50-watt phone transmitter, W2XDZ, especial-



Short wave "cueing" transmitter for talking to plane.

frequency used was 2,478 kilocycles. Before landing, the antenna was reeled in.

All of this equipment, in addition to the short-wave and long-wave receiving sets, was located in the forward of the plane's three compartments, directly behind the nose of the plane, where the two pilots were located. This left the center compartment between the control room and the studio for the carrying of invited guests and for use as a "buffer"

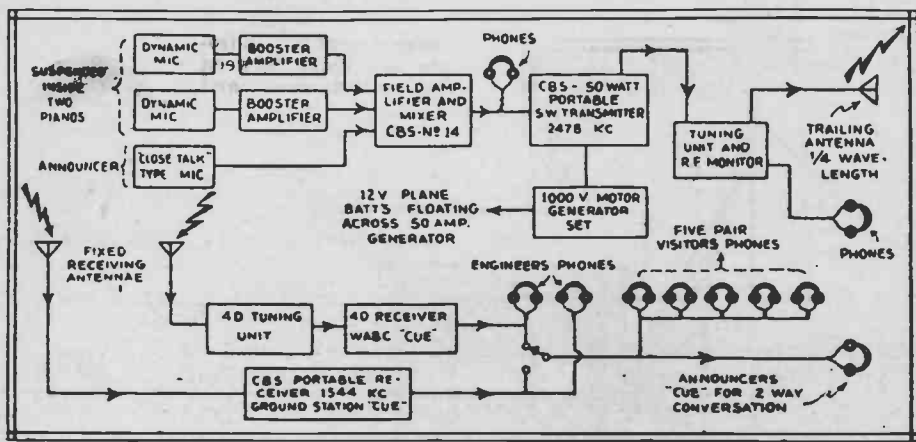
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Music from the Air by Short Waves

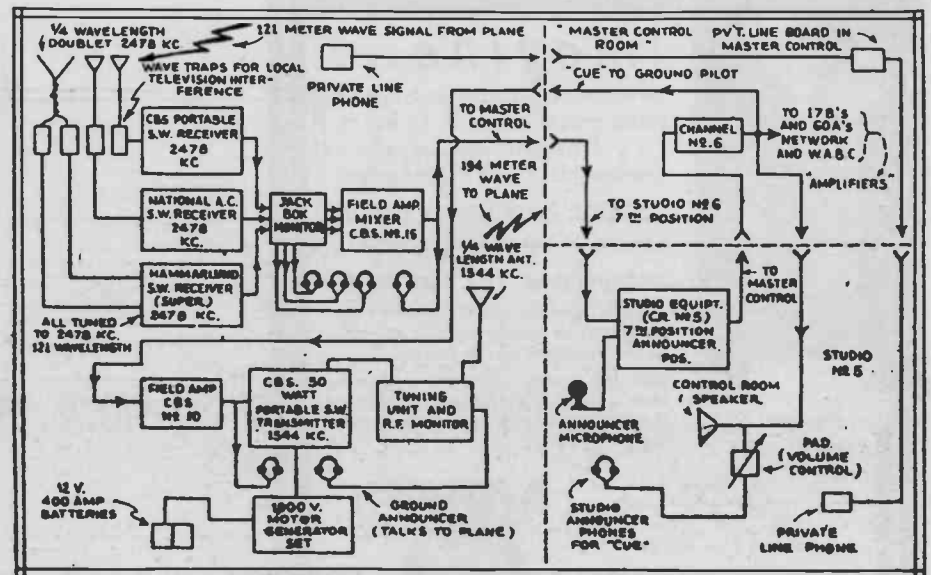


Line-up of the radio broadcasting and receiving apparatus installed aboard airplane.

During the tests, Mr. Edwin K. Cohan, Columbia's Technical Director, carried on a two-way conversation from his office with Henry Grossman, Division Engineer of Columbia, who was in the plane and had charge of the technical set-up at that end. The installation was made in such a way that Mr. Cohan, sitting at his desk by a window, from which he could see the plane flying over the East River, could talk from his office over the ground "cueing" station, W2XDY, using no other microphone than his telephone handset, and give Mr. Grossman reports from time to

time on the reception of the tests from the plane. As his loud-speaker was tuned in to the tests, Cohan could not only hear Grossman's voice broadcast from the plane, but his own conversation with Grossman as well.

Immediately after the conclusion of the broadcast, which was carried on for 15 minutes during the afternoon of May 2, highly favorable reports started to come in, and for several days after that congratulations were coming to Columbia in profuse quantities. Despite the fact that this was the most difficult aviation



Arrangement of short wave transmitting and receiving apparatus at the ground station for the airplane broadcast.

broadcast yet attempted, all reports agreed that it was entirely clear and most successful, due to the many thorough tests and precautions which were taken to assure the elimination of all interference.

Congratulations are due to the engineers who handled the broadcast: Messrs. Grossman,

Thompson, and Gilbert of C. B. S., and Manley of the E. A. T. in the plane, and Messrs. Cohan, Howman, Sponner, Illigias, and Butler at the ground station. With this, another unique short-wave broadcast has been concluded and added to the list of Columbia's trail-blazing broadcast events.

Horn Contour

continued by Bruce C. EDGAR

SB: What did you do after the failure of Voigt Patents, Ltd.?

VOIGT: I had various activities such as teaching electronics, consulting, etc. There was a period of employment while I was working in a lab of a firm that made office dictation machines using tape. This gave me the opportunity to gain first hand experience in tape recording research. Hardly Hi Fi, but very instructive all the same. I was very surprised at the distortion figures for slow tape speeds.

Unsuspected tape distortion may well explain why there are so many records which do not satisfy the ear when heard over really first class equipment. The highs are there, the lows are there, so is the mid-range, but they leave you dissatisfied. The sound of live music contains a satisfying richness which many records lack.

In my opinion, freedom from distortion is even more important than a wide frequency range. I regard a distortion free system with a range of 40 to 10,000 Hz as better than one which distorts appreciably even though its range might be 2 octaves wider and run from 20 - 20000. The target, of course, is full range without any distortion.⁹

Also during periods of rest and in between jobs, I started to think about the basic nature of gravity, electricity, etc., which were more than enough to keep me out of mischief.¹⁰

In 1960 I was employed with the Canadian Federal Government in radio regulations (anti-interference section). A very satisfactory time with that job was spent in the lab, developing test techniques, apparatus for direction finding, etc. This gave me a better understanding of the relationship between electricity and magnetism and the electromagnetic wave, etc. In 1970 I retired to a country dwelling in Brighton, Ontario with more time to concentrate on the riddles of the fundamentals of nature.

SB: Describe your meeting with Paul Klipsch in 1974.

VOIGT: At the 1974 Audio Engineering Society meeting in New York, I was asked whether I or Paul Klipsch were first with corner horns. As I was about to answer, the fellow with the mobile mike went over to some one in the audience section and I was saved from replying for he told the audience that "When he was applying for his patent my work was among that brought up against him." It was Paul Klipsch himself speaking.

From there I picked up and filled in details. I told the audience that after reading his first horn paper, I had sent a copy of our literature as I thought it would interest him. However I did not have his ad-

dress and sent it to the organization that published the paper.

It was never acknowledged. So, I did not know if it had ever reached him and if he was very busy or simply impolite. He was able to reply that he had no recollection of receiving it, and so a question which had been in my mind for 30 years had been favorably answered. After the meeting he invited us all to lunch and later to see some slides.

Anyway Klipsch is no longer just a name to me, and the reason for not acknowledging the literature may well have been that it never reached him.

(Editorial note: Klipsch told me that he later tried to find out the exact claims that were held against him, but he said that those details could not be found in his patent papers. Also at this meeting Paul Voigt was made an honorary member of the Audio Engineering Society in recognition of his pioneering achievements in the pickup, recording and recording of sound.)¹¹

SB: Can you review the progress of your Voigt speakers from the 30's to the 50's?

VOIGT: The 1929 cinema speaker had a flux density of 16,000 gauss across a 2mm gap with 40-50 watts field excitation. The axial length of the gap was about 5mm. In the latter 30's for our light coil twin diaphragm as used in the domestic corner horn, the gap was reduced to 1 1/2 mm. That improved the flux to 18,000 -



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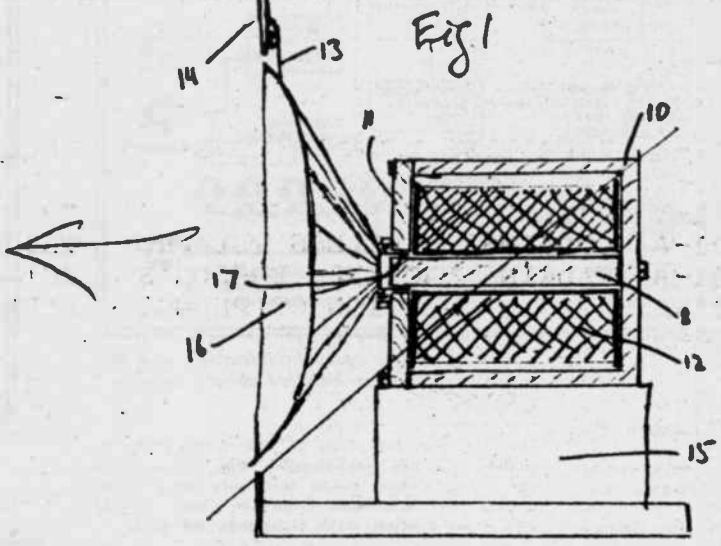


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19,000 gauss with the same excitation. At the end of the 40's with a new speech coil design I could go down to a 1 mm gap. By then we had a permanent magnet, but I had to design a 20,000 ampere-turn magnetiser to magnetise it. By 1950 the flux density was 22,000-23,000 gauss in prototypes. It never went into production because of the failure of Voigt Patents, Ltd.

SB: Do you have any advice for the testing of loudspeakers?

VOIGT: The final test should be the ear test. Some people are concerned with organ pedal tones, some with the clarity or edginess of cymbals and triangles. But the real test of a speaker system is male speech. If that sounds boxy, boomy or unnatural in any way, something is wrong somewhere. It may be in the studio or mike but if the same kind of unnaturalness persists on all program material the trouble is usually in the speaker or enclosure.¹²

And now, one more thing, go to a live concert in a hall where there is no PA gear occasionally just to keep your ideas in line.¹³

Acknowledgements

I would like to thank the following people for their support in putting together this interview: Mrs. Ida Voigt for her generosity in loaning me original photographs and papers from Paul Voigt's files; Prof. Geoffrey Wilson for copies of Voigt's letters to Wilson's father, Percy Wilson and for many conversations; Dr. Robert Edgar, Debe Arsenych, Karen Olds and Celine Walker

for tracking down many of the old references; Joe Paul for the fine photo-copying and retouching; and Yvonne Owens for retyping many of Voigt's old letters.

THE INTERVIEWER

Dr. Bruce Edgar is a space scientist for the Aerospace Corporation and is a contributing editor for SPEAKER BUILDER in the areas of horn design and the history of loudspeakers.

(References to be continued)

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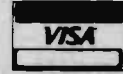
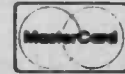
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NEW

**ATWATER KENT
RADIO
SERVICE MANUAL**
JUNE, 1931

THE FACTORY BEHIND THE PRODUCT

This Supplement, Pages 1 to 120
Supersedes Page 1 to 146, Previously Issued

ATWATER KENT MANUFACTURING COMPANY
1700 WILMINGTON AVENUE, PHILADELPHIA, PA.

**ATWATER KENT
RADIO
INSTRUCTION BOOK**

<for>

MODELS 55-60
A-C RADIO RECEIVERS

**ATWATER KENT
RADIO
ELECTRICAL VALUES
OF
RESISTORS and CONDENSERS
IN
ALL RECEIVERS
1924-1932
INCLUSIVE**

The Service Manual equipment contains numerous lists with values of all Atwater Kent resistors and condensers in receivers produced up to and including 1932.

It sets in bold type component parts list values with values for each model. In using these tables please note the following:

The value of each part is printed in heavy type under the part number. The value is given in ohms unless otherwise specified. In cases where a resistor is tapped the tap or taps are indicated on the value.

Tubular resistors are not listed in the table for each model. To find the value of a tubular resistor it is necessary to refer to page 10 which contains a complete list of tubular resistors with resistance values on identifying code.

In these tables we give only the part number and code marking of the part and not the manufacturer. To find the manufacturer these manufacturers it is necessary to refer to page 10 which lists the manufacturers. There are a few exceptions in the listing of the part numbers in the table.

In the listing of resistors and condenser values we give illustrations of the parts and resistors that were actually used in the sets. In such cases the resistors depicted are replacement or of the same value as the original. Replacement resistors are usually furnished without leads.

THE ATWATER KENT RADIO SERVICE MANUAL - 1924 TO 1932 - 520 PAGES - \$44.95 POSTPAID

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letters

Dear Sirs:

I recently came across a floor model wood cabinet radio produced sometime around (1934-38) round dial and no legs protruding to speak of. The name on it is Simplex. Now, could you shed any light on this as to what concern produced or manufactured this unit, Was it Simplex manufacturing? Or was it a set produced for Simplex by some other concern such as the Atwater Kent Manufacturing Company of Philadelphia, Pennsylvania?

B. H. Thorpe
710 Iowa Ave.
Aurora, IL 60506

Dear Mr. Cranshaw:

I was looking thru some old magazines of 1937 and I saw a picture of a radio saying it was the biggest radio in the world, it had 37 tubes and 6 loudspeakers and it weighed 475 lbs. And it was made by the Crosley Radio Corporation of Cincinnati. Would you know if there is any of these radios around yet? I would guess they were very high priced and not many made. Also are there many Edison radios in collector's hands? I have seen only one in my many years.

Henry Bremer
RD 1 Box 96
Ellendale, MN 56026

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SEND LARGE SASE FOR PICTURED LIST

FOR SALE: 1924 SUPER ZENITH BATTERY SET. Cabinet and radio in excellent condition. Write or call: Russell Schoen, R# 1, Clintonville, WI 54924. Phone (715) 823-6744.

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SEND LARGE SASE for list of radio magazines, books and sets to Waves, 32 E 13th St., New York, NY 10003

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CROSLLEY 50 - \$90 -, Radiola 3A - \$75, Aeriola Sr. - \$90 -, Western Electric 7A amp. - \$60 -, Lalley Electric - 1922 - crystal radio - \$125. All sets nice, w/o tubes plus shipping. Wanted - Crosley 124 chassis. Bob Lane - 2301 Indep. Ave., K.C., MO 64124.

Wanted

WANTED: EARLY CEILING OR TABLE FANS. ESPECIALLY ODD OR UNUSUAL TYPES. RICHARD CANE, 8391 N.W. 21st ST., SUNRISE, FL 33322.

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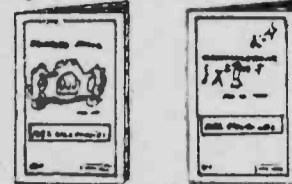


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WANTED: 1923 OR EARLIER RADIO NEWS, Science and Invention, Modern Electrics, Any pre 23 mags or catalogs. Also any Grebe receivers or amps. Also need HZ. Ray Garner, Rt. 1, Box 320, Big Sandy, TN 38221.

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WANTED: CONTROL PANEL BOARD and knobs. Also want magnetic pickup head for Capehart radio-phonograph no. 407-E. Also want crystal pickups for R. C. A. Magic Brain record changer. Also want 1940 R. C. A. radio-phonograph combination no. V-201. David Galanek, 111 Eastwood Rd. Bridgeport, CT 06606.

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