TALES OF TELEVISION IN THE TWENTIES

PREFACE

Many persons today think that television just happened right after World War II but that is not when nor the way it started. With a lot of reading to refresh my memory and the help of many friends, some who were actually involved, these stories were ferreted out and put together for publishing in the Antique Radio Topics.

John Baird, Pioneer TV Inventor

by

Kenneth McIntosh

Fifty years ago John Logie Baird, an English inventor, had finished a two year struggle to perfect and gain acceptance of a mechanical scanning device he called a televisor.

In April 1925 he demonstrated the transmission of outlines with a very crude device with very little response. Although he had shown it to newspapermen, scientists, and government officials, he still had not convinced many of the group that this was real television. They saw it, but they didn't believe it. Their reaction was like that of the farmer that gazed at an elephant for the first time. They said to themselves, "There isn't any such thing." They were polite enough and the newspapers printed short statements of what he was doing, but deep down they were not certain this was not just some trick or optical illusion some psychic influence or magicians paraphernalia had produced.

Later, on January 27, 1926, he was to demonstrate the transmission of images to members of the Royal Institute. One of the images would be a human face and the other the face of a ventriloquists dummy. Demonstrations would also be given to the technical and scientific press which would describe it in Nature Magazine in England and in Radio News in the United States. They were to be the first to call it real television. About the same time inventors in this country would experiment with similar equipment and some would be sold commercially.

Acceptance was slow in coming and fifty years ago in 1925 Baird didn't know whether his tiny, flickering, redish picture about the size of a postage stamp would ever amount to anything.

The original equipment used by Baird for his demonstration is preserved in the South Kensington Museum in London. The era of mechanical scanning television ended about ten years later with the adoption of the cathode ray picture tube and most of the mechanical televisions made in this country were thrown out with the trash. Most of them didn't last fifty years.

Today there are a few men in this country who are starting to collect this type of equipment. The remaining items are scarce, collecting is slow and thats the way it is. Sets or parts of the following names are included: Jenkins, Baird, Shortwave, Western, Daven, Echophone, See-All, Pilot, Hartman Insuline, Travler, Globe and Rawls.

– Courtesy British Imformation

John Logie Baird

THE MAN WHO INVENTED TELEVISION

By

Kenneth McIntosh

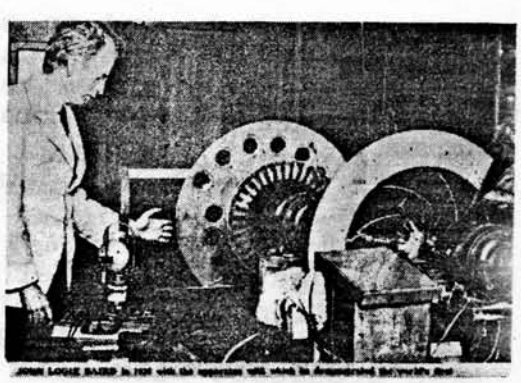
Not much is known about John Logie Baird, the man who eventually was given credit for inventing television. He was born in 1888, the son of a Scotish minister and died in the winter of 1945.

According to Sydney Mosely, a writer, who provided most of Bairds publicity, he was a sickly man who had frequent severe colds and bronchial thouble which caused so much lost time from his work that it was hard to find employment. His first job was working on motor cars in Glasgow. After graduating from Glasgow University, he was an assistant mains engineer for the Clyde Valley Co. where he supervised the repair of any breakdown in the electric service in that area. He was on call at all hours and was not physically qualified for the job so decided to get into the military service in World War I, but was declared physically unfit.

It was said that Baird had the vision of a prophet, the happy confidence of a child, and was devoted to his research work. He was a dedicated scientist and looked like one. His hair usually needed combing, and his suit needed pressing. Baird had a head full of ideas so he tried his hand at inventing.No sooner was one obstacle surmounted than his thoughts turned to another. Because his feet were always cold, which affected his bronchial trouble, his first invention was medicated, soft, absorbent undersocks and he did very well with them. He tried to make diamonds by electrically exploding a carbon rod embedded in concrete, but all it did was damage the power line. Then he went to Trinidad and tried to make jam out of the citrus fruits and guavas, but the insects that were prevalent in that area kept getting into the product.

After that Baird started to experiment with television. Most of the elements such as the scanning disc, amplification, and the light sensitive cell had been invented, and though many were trying, no one had put them together and made them work. Baird had considerable success. His demonstrations included several black and white systems, color, noctovision (pictures made in the dark), three dimension or sterioscopic, as well as the use of ultra short waves and cathode ray tubes. Through these demonstrations his systems became well known, his priority was established and it helped him raise money.

John was not much of a talker and was not at his best in a group or at a formal occasion. In some respects he was like a man who sows the seed, but does not reap the harvest. It was a long time before his inventions were recognized, but eventually he was given credit for inventing television and a plaque to commemorate his experiments was raised in 1951, six years after his death.

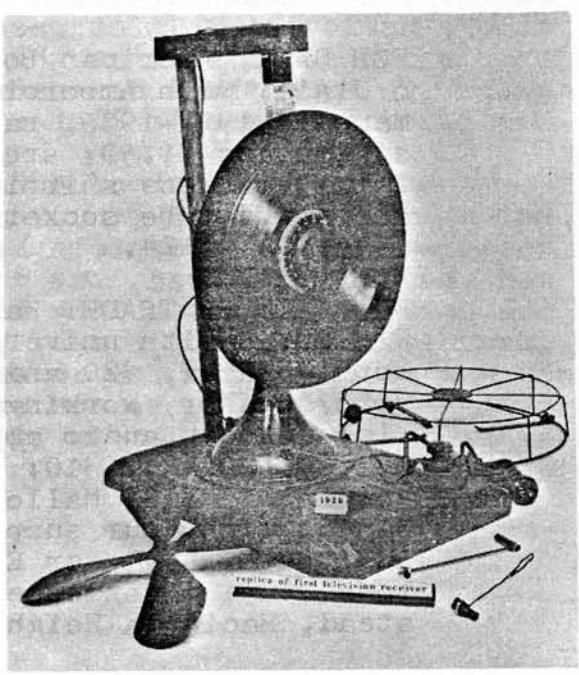


The First Television Receivers
by
Kenneth McIntosh

Nobody knows who made the first television receiver for general use. It is not accurately recorded when it was put together, where this was done or what became of it. It was probably made at home by some amateur in 1928. Several developments about that time provided an incentive for the radio experimenter to try capturing some of the new signals that were coming over the air on different frequencies. They sounded like an intermittent buzz. Some described them as the hum of a bumble bee and one man said it was the same as a buzzsaw with some of the teeth missing. Pictures show how the first receivers looked and magazine articles indicate the procedure by which they were constructed.

The gas filled neon tube had recently been invented for television but Gilbert Schmidling in Chicago got good results by using a QRS 400 milliampere rectifying tube. He applied a thin coat of banana oil over the glass and wrapped it with smooth tinfoil extending from the base 3/4 the way up. A square window, about the size of the image, was cut with a razor blade just below the horizontal level of the tube elements. One lead from the amplifier was connected to the tinfoil and the other to the plate.

The scanning disc was made by drilling a hole the size of the motor shaft in a sheet of tin or aluminum, cutting a 12" diameter circle around it, drawing 24 fifteen degree pie shaped segment, inserting a 15/32" hub in the center hole and winding a wire with a loop in the end around it until the end was just inside the circle. Then as the winding continued, a tiny hole was drilled at the end of the loop each time it passed a segment. If you were nervous, a sharp ice pick could be used to make a dimple in the metal at the hole location. Then the drill would stay on the right spot. Another way was to use a threaded rod as a radius and turn a winged nut one or two times each time you passed a segment. Small phonograph records were sometimes used to stabilize the disc and an old radio dial with holes drilled near the outer edge provided an easy way to mount the disc on the motor shaft.



The neon tube and an old electric fan motor did the same thing for television that the crystal detector and the rolled oats cereal box coil did for radio. They were simple, easy to get and anyone could put them together.

An eager experimenter by skillful manipulation and a lot of luck could some times catch a glimps of an early test broadcast with this crude equipment.

Operating the First Televisions
by
Kenneth McIntosh

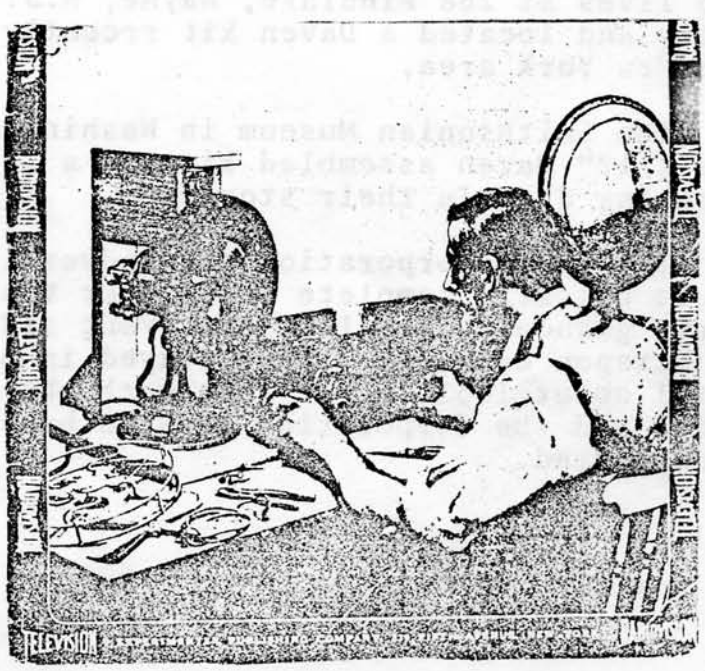
The first televisions did not work very well. They produced an image but it took more than a flick of the switch to do it.

First you had to get a strong signal on the speaker of a short wave radio and then switch the speaker leads to a neon tube with large plates,one of which had 180 volts DC.The disc with the spiral holes was mounted on a motor shaft in front of and close to the tube. The right side had to be forward. If it was reversed, the picture if there was one,was bottom side up. If the motor shaft turned the wrong way, the picture would be reversed like looking into a mirror. It was not bad to look at, but the captions were hard to read.

It was necessary for the motor to have the correct speed, and here is where the real trouble began. If it was a universal motor the sparks from the brushes interferred with the signal. If it was a conduction motor it would race or drag a little as the line voltage fluctuated due to changes in the current or load on the line. A rheostat was used to compensate for this, but it kept you busy and one could slice a finger on the disc while reaching for it. Using a synchronizing motor helped a lot, especially if it was on the same power line as the broadcasting station.

In addition to maintaining the same speed as the transmitting motor, it also had to be exactly the same phase, that is the position within each turn of the shaft had to be the same. If it was a little off, or part of the distance between two holes, the picture would be cut in two,with the right side on the left and the left side on the right. If it was exactly several holes off it would be cut in two, with the top on the bottom and the bottom on the top. Some motors were mounted so that they could be rolled slightly. This was called "framing".

Another problem was called "flicker". With the early large holed discs,every time the last hole had gone across the bottom and the light jumped to the top hole to start another frame the movement was annoying. Later they discovered "interlacing", but it was not around when the first sets were operated.



Considering all these things it was quite a task. It does not seem very important now, but the fact that somebody first worked on these problems mechanically,is probably one of the reasons television is where it is today.

The Daven Corporation-Pioneer TV Parts Supplier

By
Kenneth McIntosh

By the middle of 1928 Jenkins Laboratories had started broadcasting three days a week from 3XK Washington, D.C. on 46.7 Meters. The program started with the silhouette of a girl bouncing a ball as sort of a trademark.

Amateur radio operators that tuned into that frequency could hear the video signal. Some described it as the buzz of a bumble bee, others said it sounded like an intermittant high pitched whirr and one listener thought it was similar to the teeth of a buzz saw with regular clicks as though the blade was nicked or bent.

For those who were interested, the radio supply houses started stocking parts from which radiovisors could be built. The Daven Corporation in Newark, N.J. was one of the first to list the basic items. There were the neon tube or lamp, the scanning disc and an AC 900 r.p.m. motor with a rheostat to adjust the speed.

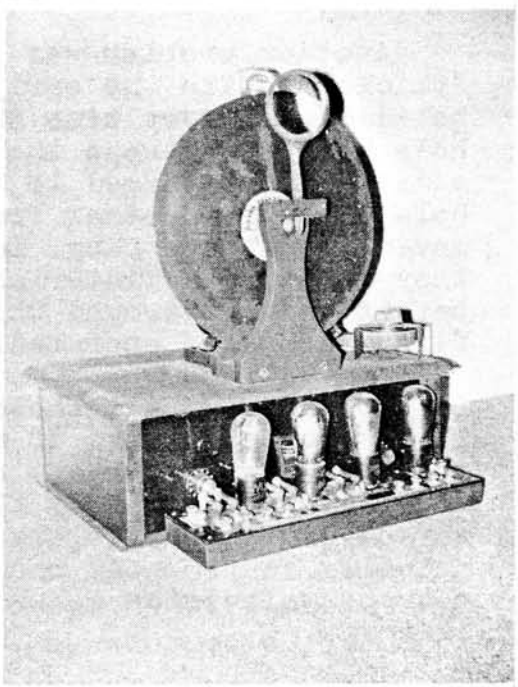
The Daven Corporation made a 12" scanning disc with 24 holes, a larger disc with 36 holes and another with 48 holes. Then there was one with 24, 36 and 48 holes all in the same disc. The 48 hole spiral was near the outer edge, the 36 hole spiral a little closer to the center and the 24 hole spiral just inside the other two. In order to change from one spiral to the other a sliding bracket was used to raise and lower the lamp.

The Daven Corporation called themselves resistor and amplifier specialists and made amplifiers with three and four stages. A 171 tube was used in the last stage for television. These units still turn up with antique radio parts.

Bruce Hertzberg, a fine young collector who lives at 268 Pinelake, Wayne, N.J. was lucky and located a Daven kit recently in the New York area.

The Smithsonian Museum in Washington, D.C. has a 12" Daven assembled kit and a large scanning disc in their storeroom.

The Daven Corporation also advertised a large box like complete radiovisor that at first glance looked like the front side of an octagon cylinder. They stayed in business until about 1933, after that both the cabinet model and the Corporation seem to have disappeared.



Charles Francis Jenkins, Pioneer TV Inventor
by
Kenneth McIntosh

About 50 years ago when John Baird was experimenting, C.Francis Jenkins in this country was working on mechanical means of transmitting images by radio. He had founded the Society of Motion Picture Engineers and built the prototype of the motion picture projecter still used in every motion picture theater. He had many other inventions and wrote articles and books about what he was doing.Among his writings were two books, "Vision by Radio-Radio Photographs-Radio Photograms"copywrited in 1925 and"Radio Movies-Radio Vision-Television. copywrited in 1929.

Jenkins had an elaborate concept of the future and predicted some day communications of all types would travel along house wires,utility pipes and even railroad rails to all parts of the country. He was not exactly an electronic genius but he could make almost anything that was mechanical. This ability helped him develop several types of scanners. These included the disc with holes made out of both cardboard and metal,starting with 24 holes,increasing in number as he progressed up to 120 and then the holes were replaced with 60 small lenses. In addition to these he designed what he called a pyramid disc and complicated metal drums with mirrors.

Although Jenkins gave his first public demonstration of radiovision just three months after Baird's demonstration in England, he was not given credit for inventing television.

After a Jenkins Television Corporation was established in Passaic N.J.,commercial video receivers and radiovisors were made available to the public. The Smithsonian Museum in Washington D.C. has several models and a few are privatly owned. Robert Base who lives at 4105 Alto rd.in Baltimore Md. originaly purchased a model 302 and wrote an article about his experience using it.

Jenkins TV Corp. made the following radiovision equipment;

JK 20 receiver kit *
JD spl. receiver assembled
JDS spl. receiver w/self sync.
JD 30 radio & video receiver
RK 2 radiovisor kit
102 radiovisor w/sq.holes(1 1/2"image) *
202 radiovisor w/drum scan(7" image)
302 radiovisor w/120 hole disc(4"image)
400 radiovisor com.w/lens & ctr.tube

RK 11 lens to go with RK 2 *
502 sync. motor
601 neon lamp

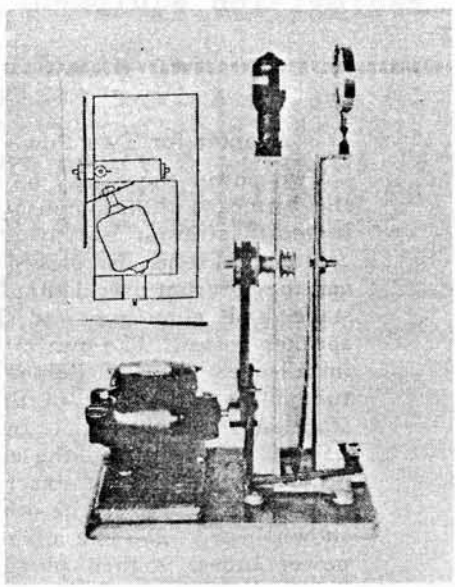
EARLY TELEVISION in PHILADELPHIA

BY
Kenneth McIntosh, Baltimore, MD

Philadelphia did practically nothing about broadcasting television in the early stages, but it provided receiving equipment to radio fans from Denver to Montreal. Scanning discs and other things that went with them were made there, sold in the stores, and could be ordered through the mail. The catalogs for these items included the following.

2- 1/6 HP synchronous motors 1800 RPM & 1200 RPM
1-Transformer for 100 KC selectivity
2-Mounting stands, 24 & 14 inches
2-Neon lamps, 1 1/4"X 1 1/4"plate, and 1" X 1" plate
1-Crater lamp
4-magnifying glasses 3" & 4", with and without holders
1-Framing lever
1-Set of tapered pullies, one 27/8"and one 1 7/8" in diameter
1-Endless belt
6-Blank scanning discs, 12", 14", 16", 18", 24", & 30", in diameter
5-Perforated scanning discs, 14", 18", 24", 30", & 36" in diameter, 45 or 60 round or square holes, later lenses were added and others were made to order.
2-Complete scanners with motor, disc, pullies, lamp, magnifying glass, and framing lever, one with a 24" disc and one with a 14" disc

These scanners were unique in the way the speed was controlled. Although they had a synchronous motor the same as others, it did not require a rheostat to vary the revolutions per minute. The motor speed was not changed. The speed of the disc was adjusted by changing the ratio of the driving force between the motor and the disc. This was done by sliding the belt back and forth on two tapered pullies. When slid one way the motor pully was larger and the disc pully smaller. This increased the speed without affecting the motor. When slid the other way the speed was decreased. This system seemed to have considerable merit as C. Francis Jenkins wrote a letter saying, " I think we shall set up a similar apparatus". We do not know how far he went in using this idea, but he did design a scanner with a rubber flange on the motor shaft that drove the disc by friction. As the disc was pressed against the flange, the contact point was nearer the center, the radius was smaller and the speed was reduced.



We do not know how this scanner became so widely known, but one day two men from New York City came into the shop, watched a demonstration, and purchased a scanner. This purchase was followed by several others which eventually turned up with their identification removed at demonstrations in Atlantic City, NJ and then in other places all over the country. It seems the demonstrations were to sell stock in a new mechanical television company that was going to manufacture the receivers, but moved around to fast to make any sets.

Charles S. Hartman-Television Pioneer

by

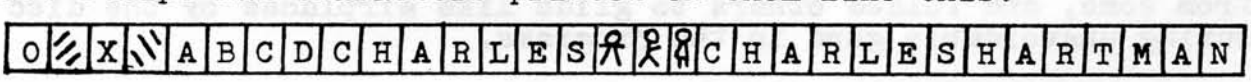
Kenneth McIntosh, Baltimore, MD

Almost everyone knows that Charles Francis Jenkins was a pioneer in the Telivision field, but do not remember Charles Hartman who was also active in the Television at the same time. Charles Hartman was not connected with the radio making Hartman Electric Co. He was born May 19, 1900 and at the age of 15 was aPhiladelphia radio ham using the call letters 3CH. His club used their first and last initial with a number prefix until they got their license.

Hartman was originally in the automotive electrical repair business, repairing generators, magnetos, starters, and batteries, but in 1928 he became interested in Television. In fact his name was listed in what Jenkins called his "Honor Roll" of inventors. After that Hartman developed one of the largest distribution centers of scanning disc Telèvision parts which was operated as a subsidiary of Dienelt & Eisenhardt, Inc.

Of his early experience with Television Charles Hartman said, " I had a picture scanner transmitter (by wire not wireless) on my right side as I looked into my 36" disc receiver. On my left was my amplifier and Majestic high voltage power supply. The amplifier had spring clips so I could improve picture detail by changing values of condensers, resistors, etc. I finally got so I could send good half-tone pictures from ordinary photographic film. The fact that the film was a negative made no difference because I could change my form of detection in the amplifier by merely using a double throw switch. When I had free time in the shop and no one was sending out pictures, I simply started my transmitter and made my own".

" If I wanted to demonstrate to visitors, I started the apparatus, lighted the 1000 candle power bulb and focused the lense on the transmitting scanning disc. I used some pieces of celluloid strips cut from an old touring car top for transmitting. These strips had characters printed on them like this:



Each of these boxes was a picture frame. If moved slowly you could see the words spelling my name in the receiver cabinet".

Hartman went on to do many things after mechanical Television declined. In 1936 he started doing machine design work, and in 1938 he became a design engineer for the Scott Paper Co. He then went to the Engineering Dept. of Dupont, followed by 2 years with the Diamond Match Co. In 1945 he established his own drafting service which he continued until he retired in 1951. He now resides at 207 Main St., Millville, NJ.

Early Telivision Programs
by
Kenneth McIntosh

May 28 1928 is considered to be the first date regular programs were broadcast,and on September 11 the first play was put on the air. It was called "The Queens Messenger". Two scanning discs were used, one produced the face of the actor and the other the background. It was something like a modern baseball game. One camera focuses on the batter and the other shows the outfield when he hits a home run. From time to time other programs were mentioned in newspapers, magazines, and books, but th interesting things are what happened in between these remembered broadcasts.

Experimental broadcasts were being made by several organizations such as Bell Telephone, General Electric, and NBC as well as Jenkins Laboratories and other smaller companies. Most of these, especially the small ones, had funds for experimenting and invention, but little or none for program material or talent to broadcast. As sort of a trademark to start the program, NBC used a statue of Felix the Cat spinning on a phonograph turn table and Jenkins used the silhouette of a girl bouncing a rubber ball. After that almost anything was used. News events, political talks, tap dancers, amateurs, and even a dog fight was shown. Jenkins invented and used a machine that rolled motion picture film vertically and a disc with holes in a circle instead of a spiral to scan the film horizontaly, but broadcasting still and moving pictures was not considered true telivision by some critics. It had to be something familar and it had to move. There were written accounts of worthwhile programs, but for everyone of these there were several unoted, unscheduled, spontaneous transmissions of material in a mad scramble to get anything to keep the screen from being blank. The problem was to get something in front of the disc in time and make it last until something else was ready. I was told that out in Chicago the engineers even grabbed sheets of paper, cut dolls from some, and folded others to glide like airplanes by the disc during unavoidable gaps in the programs.

While visiting Jenkins Lab. Robert Base from Baltimore was invited to stand in front of the scanner. While he stood there a candy bar was shoved into his hand which he ate to create movement. If parts of programs had been given titles in those days, this one could have been called Jaws.

As funds became available regular actors were used, but those from the stage had trouble acting without an audience. Radio actors stood still and only moved their lips. Movie stars usually made one scene at a time with a rest inbetween. When they had to do a whole program at once, many could not and some did not want to. How times have changed.

Transmitting the Early Telivision Programs

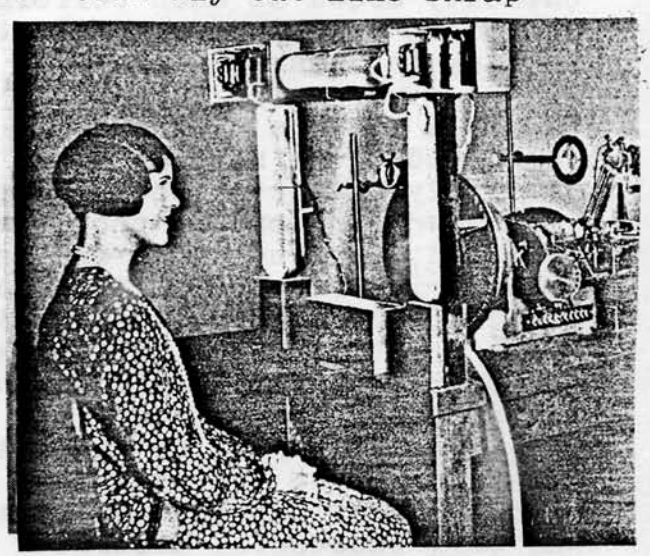
by

Kenneth McIntosh

In the early days of telivision many different mechanical devices were used by the various experimental transmitting stations. Scanning was done with mirrors, drums, glass, and metal discs and combinations of these. The most common were metal discs 24" across with holes$\frac{1}{4}$ inch in diameter. Broadcast stations were constantly changing equipment in an attempt to improve the quality of the image. This included the discs. Better defination required smaller holes and more of them. At one time WGY Schenectady, NY was coming through with 24 lines, WRNY in the Hotel Roosevelt in New York City had 48 holes and Jenkins Laboratories in Passaic, NJ was using 60. Before long there were broadcasts coming out on 24 holes, 36 holes, 45 holes, and 60 holes.

Another problem was lighting the subject. As the holes increased in number and decreased in size the lights had to be brighter. Flood and spot lights were increased until people on the program were nearly blinded. The heat from the lamps scorched their faces and visitors said even the room was hot. When an actor said he was burned up he meant it.To reduce heat and glare some inventors created a scanning spot by shining it first through a spiral holed disc and then on the subject. This shielded the actor from most of the light and if adjusted properly provided a brilliant illumination of only the hole effecting the photo cell at that moment. This method of providing a bright sequence of tiny dots when and where they were needed had practically no ill effects on the individual whose image was being transmitted.

The stations tried square holes which passed more light, but all of these little perforations permitted the light to spread before contacting photo tube. To prevent this lack of efficiency, glass lens were placed in the holes to focus the light. In one instance lenses $2\frac{1}{2}$ to 3 inches were used in a disc that was 4 feet across. The edge of the disc had to rotate at a speed of 2 miles a minute. By this time it was going so fast that the lenses would fly out like shrapnel from a bursting shell. Sometimes they would cut holes in the walls and ceiling. A steel band was then placed around all scanning discs everywhere that were not enclosed in cabinets and the use of large lenses was abandoned.



Frequencies used in broadcasting were not very uniform in the early days. Some stations were on the police band of 75 to 2000 mc. Some started with one frequency and then changed to another. All these changes created problems for the amateur radio fan who was trying to receive television programs.

IMPROVEMENTS TO EARLY TELEVISION

by

Kenneth McIntosh

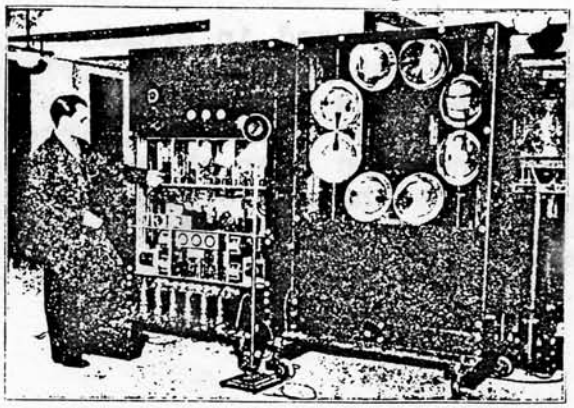
A young experimenter in Chicago probably improved and advanced early television as much as anyone at that time. His name was Ulysses A. Sanabria and he had many ideas. Some were his own and some were borrowed, but he put them together, made them work and showed the results to the public.

Sanabria had been experimenting with television for about five years. Then in June of 1928 he started transmitting from WCFL on 620 KC with a 5000 cycle modulation. At that time other inventors thought broadcasting on the regular broadcast band was impossible. When Sanabria produced images of prominent persons with a signal that was sharper than the ordinary voice and music pulses, they called him a genius. In David Sarnoff's article in Modern Mechanics and Inventions Sanabria was described as a television wizard.

His most effective effort to promote television was the exhibit he staged at the Radio Worlds Fair in Madison Square Garden, in New York City in September 1931. There were 4 receivers running from noon until 11:00 AM every day during the week. There were always long lines of people waiting to gatch a glimpse of the pictures they produced.

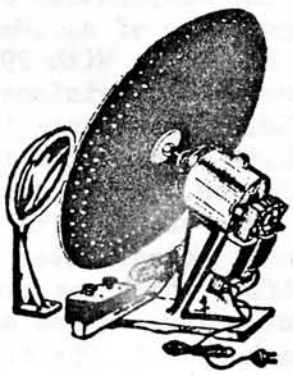
One of Sanabrias ideas was the oscillating circuit to control vertical synchronization. Another was the three partial spiral holed disc toeliminate flicker on the screen. He also developed an amplifier and microvisor for theater presentations to project television pictures on the screen which was 10 feet square. The microvisor had 8 photocells mounted in reflectors. The performers stood in absolute darkness facing these cells while a tiny light beam scanned their features. This was the exact opposite from previous systems. Normal reception was accomplished by brightly lighting the subject which provided electrical pulses through a hole that picked up one spot at a time. This procedure lighted one spot at a time which provided pulses to all the photocells at once. The first regular presentation of television as a part of a regulartheater show was given in New York City from October 24 to November 6 at the Broadway Theater. There was a capacity crowd at each performance.Sanabria television was also presented in the Hippodrome Theater in Baltimore, MD , and at the State Theater in Newark, NJ.

Sanabria was one of the first to broadcast voice and images on the same 5000 cycle modulation at the same time. At the transmission end he simply connected the microphone into one of the audio amplifier stages working on the photoelectric cells. At the receiving end he inserted a low frequency filter in the plate circuit of the last audio stage working on the loudspeaker. This circuit worked only because the voice pulses were low and the image frequencies were high. The voice pulses did have a tendency to break up the image, but the experiment was very successful according to those who saw and heard it. All this equipment seems to have disappeared.



The amplifier and microvisor developed by U. A. Sanabria (at left) for use in theatrical presentations to project television pictures upon a screen six to ten feet square. The photoelectric cells are placed in reflectors, and the cells are mounted so that the varying impulses are reflected upon the light sensitive material. Note that each pair of cells is adjustable by means of the bars upon which the reflectors are mounted.

LATER MECHANICAL TELEVISIONS
by
Kenneth McIntosh



Pioneer Television, which was not as early as the name implies, was located at 26 Exchange Place in Jersey City, N.J. They advertized an assembled scanner in 1931. It had a 120 hole disc mounted on a synchronizing motor held in a tipped back position. The image was viewed at the bottom of the disc and they claimed it eliminated stooping. At first glance it appeared the picture at the bottom would be bottom side up and you would either have to fasten the set to the ceiling or stand on your head to see it in the right perspective. This was not necessary for the disc was turned around and mounted from the other side and the innermost end of the spiral of holes would pick up the signal first and although the image would be a little narrower at the top, it would be right side up. This arrangement was unique but Jenkins had used almost the same thing in one of his later models to bounce the picture from a mirror onto a screen thereby getting a larger image by reflecting it farther in a small space inside the cabinet.

Travler Radio and Television Corporation in St. Louis with L.H.Conrad as engineer was in the home and car radio business. They also produced a receiver and scanning disc kit. The scanner had a choice of a 60 hole disc turned by a 1200 RPM motor for regular broadcasts or a 45 hole disc with a 900 RPM motor for transmissions from Chicago by Western Television.

Freed-Eissamn, a well known radio manufacturer in Long Island City,N.Y. advertized a scanning kit to go with one of their radio models. It had 60 holes and was similar to other types already available to the public. Their objective seemed to be providing an additional use for their radios and thereby increasing sales.

Continental Television Corporation also advertized a kit with an elaborate cabinet. There was no detailed explanation of what was in it and it is doubtful if many or even any were sold.

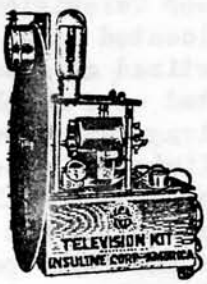
By this time various systems had been developed, tested and recognized to be the most efficient. Discs that produced 60 lines for definition, crater tubes and lenses for light concentration and motors that synchronized with the line current were generally the accepted ones. Synchronized voice signals received separately on another channel were still considered desirable even though transmission by superimposing them on the same signal had been successfully accomplished.

Globe Television and Phone Corporation at 185 Devonshire Street Boston,Mass. seems to be the first to produce a complete television that included nearly all of the features developed at that time. it had an attractive cabinet, shaped similar to the See-All model. It had for the first time a 60 lens disc and crater tube as standard factory equipment, the motor synchronized with the line current and the cabinet included an eight tube receiver with every thing controlled by five knobs on the front panel. This model like most of the others are seldom found and then usually in very poor condition.

INSULINE CORPORATION OF AMERICA TELEVISIONS

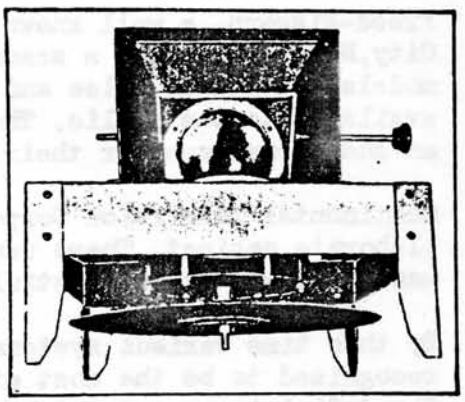
by

Kenneth McIntosh



Insuline Corporation of America at 23 Park Place, New York City with the guidance of A.G.Heller, Chief Engineer became very active in 1931 and 1932. With 29 chassis and 45 models in radios, they decided to include televisions. First there was a scanning disc kit listed at $37.50. It was a simple small oak box like enclosure with a slab of bakelite holding a motor on top of it. On top of that was a neon tube mounted on a small four legged table. The motor turned a 15" diameter disc made of bakelite that was 1/16" thick. This disc had a spiral of 24 small holes. Later this kit came out with 48 holes and a four tube amplifier which was also sold separately. Although other tubes could be used, when it was made the prefered type was stamped right on the bakelite top next to each socket. The first two were 40s and the last two were 71s.

Next they put out a radically different model. A smaller unit and a wider viewing range seemed to be the objective. This scanner was shaped like an old electric hot plate, square with four legs, an adjustable mirror with a hood over it. It had a 12" disc with 60 holes which was the standard being transmitted at that time. The disc revolved horizontally underneath and the image was reflected upward through a magnifying glass and forward off from the mirror. It was claimed this exclusive model widened the angle of vision and permitted a number of people to enjoy the picture at the same time. It was called the "Visionette". A Chicago firm had also used the same name but I.C.A. had Already labeled some of their radios "Champion","Envoy" and "Envoyette" so they seemed to have a priority on at least the last part of the tilte.



The I. C. A. "visionette" television scanner produces a large image in a mirror, so that several people can see and enjoy it simultaneously.

As television improved late in 1931 and 1932 I.C.A. made a more refined model with a cabinet. This one had a speaker for switching to sound. The combination home television shortwave receiver and scanner plus amplifier was an attractive unit,rounded on top with a vertical column on each corner similar to the design used by the See-All model. The magnifying glass at the top was inserted in a shadowbox to cut down the glare. The 1200 RPM motor brought the disc up to speed and then a synchronizing motor adjusted the holes to match the transmitter and kept it there. The usual speed controls,both manual and electrical, found on most earlier types made by other producers were not present on this model. Although it was rather large, I.C.A. called it their midget. The receiver had a range from 80 to 200 meters and could be changed from a tunning on a shortwave station to the testing range of television broadcasts by merely throwing a switch. This was included in their regular scanning cabinet for $200. It was a very up to date competitive set but the mechanical era was starting to decline and it is doubtful if many of them were sold.

Insuline Corporation also demonstrated transmission and reception of motion pictures in the window of a Brooklyn department store in 1932. The large pictures they produced were accomplished in a manner somewhat similar to that used by the Bell System except instead of a long glow tube bent back and forth to produce lines,I.C.A. built a screen out of hundreds of small lamps.

All I.C.A. equipment seems to have disappeared except one or two discs, a five tube amplifier and a motor which was found recently by collectors.

THE SEE-ALL TELEVISION RECEIVER

by

Kenneth McIntosh

Television Products of America, later called Television Manufacturing Company of America at 5 Union Square, New York City made a televisor kit labeled the See-All. It could be assembled in less than 20 minutes (according to the instructions) and cost $19.75. The kit was supposed to be fool proof and had a companion receiver which, without tubes, was listed at $39.50. It was a very economical kit and was popular with the young radio fans and experimenters.

Television Mfg. Co. of America does not appear to have had much experience with radio, at least not under that name, but they claimed to be a pioneer in the experimental and development work in every branch of the television field including lens discs, projection equipment, ultra shortwave receivers and cathode ray scanning.

The shortwave receiver had a tuned radio frequency arrangement using two stages with No. 35 tubes and coupling transformers with primary windings capacitively coupled to the secondary windings. One end of the primary winding was left open which at first glance seems a bit unusual. The audio frequency amplifier had two stages with resistance coupling using a 24 tube and a 45 in the output stage.

The scanning disc, which alone could be purchased for $2.50, had 120 holes in a double spiral that produce two images simultaneously, one on top of the other. One of the pictures was usually split horizontally (half on the top and half on the bottom). Framing could be done by sliding the light up or down so that only one complete picture could be seen. There was also a lens disc available at $25.00.

The 1200RPM motor was similar to the one used by Jenkins. It was the eddy current type with a synchronizing wheel mounted on the shaft between two coils. It had six protruding areas somewhat like the cogs on a gear. After the disc started spinning each protruding area of the wheel got a little tug from the magnetic pulse as it passed the laminated center of the coil connected to the AC line current. If the disc got out of synchronization the AC pulse speeded up or slowed down the wheel which pulled the disc into line. The difference between this motor and the one used by Jenkins was the wheel was connected to the disc by a spring wound around the shaft. It evidently acted as an equalizer or shock absorber because when the current was turned on the wheel spun around several times before the disc started.

By the end of 1931, Television Mfg. Co. evidently thought it was time to capitalize on television commercially so they made a more elaborate model. It was a nice looking set with an attractively shaped and decorated cabinet which was suitable in the home for members of the family. The various functions had now been developed to the extent that the scanning, amplification, power supply and video receiver could all be put in the table model but there still were no provisions to combine the sound reception and the cabinet had no speaker.

Size 27" x 18"

Television Mfg. Co. also sold the complete synchronous motor and lamp support separately at $40.00 and a crater lamp for use with the lens disc for $7.50 - most of these items were manufactured in a factory at 473 Liberty Avenue, Brooklyn, N.Y. They seemed to be very popular and occasionally one of their sets turns up for collectors.

WESTERN TELEVISION CORPORATION

by

Kenneth McIntosh

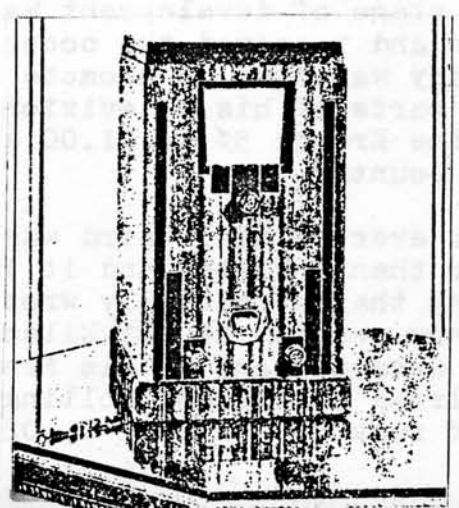
Several improvements in early television receivers were made by the Western Telivision Corp. at 400 W. Madison Street in Chicago. Like many improvements,the changes were not entirely unknown, not very complicated and did not attract much attention at the time,but they were definite steps toward the methods used today.

The first was a simpler way to frame the picture on the screen. The speed of the motor had to be the same as the one in the broadcasting station. Electrical and manual controls would usually do this and stop the horizontal spinning and rolling. That would make the elements of the image stand still, but most of the time they were in the wrong place because the spiral of holes did not start at the top of the screen at the right time. The bottom could be at the top or the elements could be on the wrong side. After the receiver had the right speed,the same controls had to be changed again to get the rotation of the disc synchronized with the signal. Then the speed had to be changed back to normal without breaking up the picture. This second adjustment was called "framing".Western Telivision,whose receivers were made by the Ecophone Radio Mfg. Co., simply mounted the motor on a rotating shaft so that the difference could be adjusted by turning a knob on the front panel without distrubing the speed of the motor.

The second improvement made by Western was called "interlacing". It had been used before to produce color by alternatly transmitting the red,blue,and green filtered from the subject by arranging three partials around a disc. The first spiral scanned lines one,four, seven etc.The second scanned lines two,five,eight,etc.and the third scanned lines three,six,nine etc.to complete one frame. Western used the same three partial spirals on a lense disc to receive black and white. This was the beginning of our present system except only two interlaces are used instead of three.On other receivers when the light from the last hole at the end of the bottom line jumped to the beginning of the first line at the top,the movement was annoying. The same thing happened with early motion pictures when the reel was running slow and they called it"flicker". With interlacing the same thing happened three times and was too fast for the eye to follow.

The third improvement was in size,until then a telivision receiver included a shortwave radio for sound, another for the video signal a power pack and scanning disc.Western reduced the size of their cabinet and included the receiver,voltage supply and scanning disc into the smallest model of that period.

According to Leo Hruska who was with Western to the end,they did make one mistake.When the mechanical era started to decline in the states, a large number of receivers were sold to the Mexican Government. By the time they were made there was a minor revolution in Mexico,the heads of the government changed, the order was cancelled and Western went bankrupt. Leo remembers very well that they were never paid for the receivers because for the last three weeks work he did not get any pay either.



HOLLIS BAIRD OF BOSTON

by
Kenneth McIntosh

In every organization there is a man with ideas who knows how to make them work. One was Hollis Semple Baird chief engineer of Short-wave and Television Corp., 70 Brookline Ave., Boston, MA. This Baird was no relation to John Logie Baird from Scotland, but they did have something in common. Both were interested in perfecting and prom-oting television.

Prior to their venture into television, Shortwave put out several radios. One was an AC operated model, one DC, and one with batteries. They also made a shortwave kit for 16 to 100 meters and a shortwave converter to plug into a detector socket of a receiver. Then the universal shortwave and television receiver was offered to the public. There was a kit, a receiver, a radiovisor, and a console model includ-ing both. This pair got around quite a bit and still does. One is in a collection in New England, one is in Baltimore, one is in Japan, and one chassis changed hands at the last Kansas City meeting.

According to the records Hollis Baird gave his first demonstration of television at the Hotel Statler in Boston in June of 1929. The equipment was a fore-runner of the models developed later and sold to the public. This receiver was designed entirely by Mr. Baird and, although extremely simple in operation and nominally priced, reprod-uced a transmitted television image with as much fidelity of detail as any high priced laboratory equipment attained.

On Wednesday evening, Feb. 5, 1930, another progressive step was taken in the history of television. The first broadcast synchronized voice and vision as a part of a regular program was successfully completed by WEEI, the 1000 watt broadcasting station of the Electric Illuminating Co. of Boston, in conjunction with their television station W1XAV. This was probably the first time two separate signals were received at the same time and synchronized on different receivers.

Another chapter of television history was made on the evening of Fri-day, July 24, 1931. A television program including the Honorable James F. Curley, mayor of Boston and George Bancroft, a well known moving picture actor, was transmitted from the studios of Shortwave and Television Corp. This program was received on regular stock models of the Baird shortwave and television receivers on board the steamship Leviathan about 300 miles at sea.

As previous experience with automobiles and radios indicated the high-est stage of development was made after it was brought out into the open and received the cooperation and support of the public, this policy was used to promote the Baird equipment. At it's peak Baird had parts of his television equipment being sold in the Kresge 5¢ to $1.00 stores in all parts of the country.

Hollis Semple Baird, whose research work

What ever he did, Baird was evidently more of a doer than a writer and it is hard to find any-thing that he actually wrote about his own work. He now resides at 221 Wilson Ave., Waleston, MA and devotes some of his free time to collecting railroad trains and rolling stock of the type that runs on standard 0, 027, and S guage track.

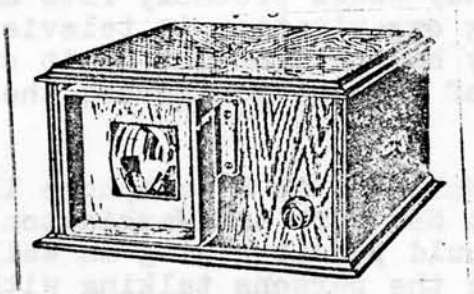
SHORTWAVE AND TELEVISION CORPORATION
by
Kenneth McIntosh

Shortwave and Television Corp. in Boston was not one of the first to develop television, but when they put out a commercial model it was a radical change from the sets other companies had produced. Not only was the design different, but it was better in several ways. One was the use of a drum instead of a disc to do the scanning. Other inventors had experimented with small drums, but most were rather complicated and were soon abandoned. Shortwave made one that was large and light in weight. They then published a book entitled "The Romance of Shortwaves and Television" which explained how the radiovisor and universal receiver were put together ond how they operated.

No matter how large a disc is, the picture it produces is curved on the top and bottom. The border along the sides slants inward and the bottom is narrower than the top. This results in a picture that is wedge shaped like a piece of pie with several bites missing. Shortwave drums had 48 and later 60 square holes that produced a good image that was flat on the top and bottom with straight vertical sides. Of course there was a slight backward curvature on the sides, but no one noticed it. At least every one recognized the fact that Shortwave television receivers got better pictures from Boston.

Shortwave included an amplifier stage with a 45 tube in their radiovisor. This permitted the last amplifier to be disconnected with the visor so the receiver could be used separately as a radio. The motor had a rheostat in the AC line for major speed control and a 48 tooth phonic wheel on top for synchronizing. There was a framing lever on the right side of the cabinet that was connected to a coil magnet to which a sync. pulse in the signal was applied. If the signal for the first line of the image started after the raster was part way across, moving this lever would shift the magnet so that the pull of the pulse would be felt sooner and drag the drum back a little bit. If the signal was fast, moving the lever the other way would jerk the motor and drum ahead. If the signal for the first line was way down in the middle, the AC line switch was flicked off and on rapidly so as to adjust but not permanently disturb the motor speed. The way the set was operated was: tune in the right program on the receiver, snap the AC switch to ON, turn down the lights, adjust the rheostat until the picture stopped spinning horizontally and rolling vertically, jiggle the AC switch until the top of the image was at the top of the frame, and then move the lever untill the center of the image was in the middle of the picture area.

Shortwave and Television Corp. put the receiver and visor in matching cabinets with hinged lids. One inovation not found in other visors was the 3" viewing chute with a shadow box that stuck out in front. It did not improve the appearance of the cabinet, but it did keep the surrounding light out and made the picture clearer.



BELL TELEPHONE AND TELEVISION

by

Kenneth McIntosh

Bell Telephone Laboratories, with the motivation and guidance of Dr. Herbert Ives, was one of the first corporations to experiment with television. In April 1927 they gave a demonstration both by wire and by radio. The wire demonstration consisted of transmitting images from Washington, D.C. to the auditorium of Bell Laboratories in New York, a distance of over 250 miles and the radio demonstration sent images from the Bell station at Whippany, New Jersey to New York City, a distance of 22 miles.

The images were received on two different receivers. One produced a small picture about 2 by 2½ inches for viewing by one person and the other a large picture 2 by 2½ feet for viewing by an audience. The smaller model was primarily intended as an adjunct to the telephone so that people in Washington could see as well as hear their friends in New York.

This occured only about a year after the invention of television by John Logie Baird in England. The equipment was similar to Baords, but it is not known if it was developed separately or was influenced by the previous invention. They used 5 wires to make the transmission. One was for the picture, one was a spare in case of trouble, the third for sending a synchronizing signal, a fourth for speach and a fifth for sending operating orders and so forth.

Bell did have one thing that could not have been copied from some one else. It was their neon glow lamp which must have been the longest in the world. It was a single tube bent back and forth fifty times so that each straight section produced a line of the image. There was a single wire running all the way through the center and 50 exterior electrodes cemented on the back side of each section. In this way 2500 picture elements were produced. This of course required 2500 wires to the distributor which performed the same function as a scanning disc on a small model. It is said that over 1000 men participated in this demonstration.

Like other large corporations that experimented with television, Bell evidently believed that television in a refined form would only be possible with much technical equipment and trained staff of an organization like the Bell System. Walter F. Gifford, president of A T & T said "The elaborateness of the equipment required by the very nature of the undertaking precludes any present possibility of television being available in homes and offices generally".

Bell continued to develop television and the equipment became more elaborate. They would probably rate as the leading organization in television if they had not thought of it only in terms of a means to improve the telephone.

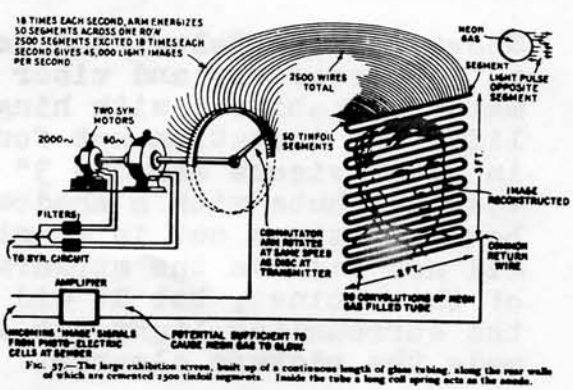


FIG. 37.—The large exhibition screen, built up of a continuous length of glass tubing, along the rear walls of which are cemented 2500 tinfoil segments. Inside the tube a long coil spring acts as the anode.

Later Bell set up a telephone line between New York and Washington that would permit seeing as well as hearing the persons talking with each other, but it was soon discontinued and the equipment sold as surplus.

W. C. RAWLS & COMPANY TELEVISION

BY

KENNETH MCINTOSH

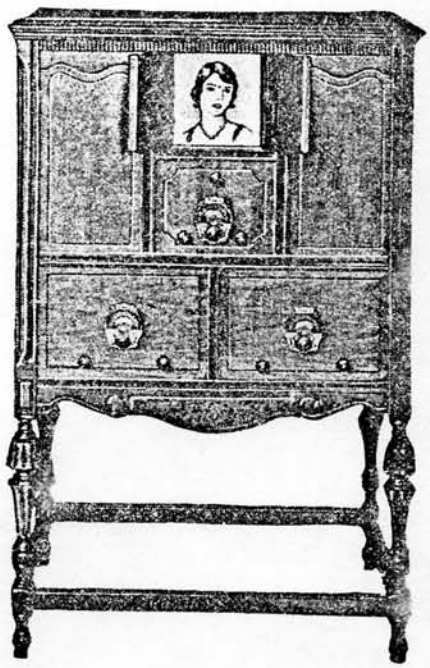
W. C. Rawls and Company in the R. N. Bankers Trust Building, Norfolk, Va. were making radio tubes in their factory at Suffolk when they decided to enter the television field. In September 1932 their first advertisement appeared in the Radio News and other publications. It outlined the features of an elaborate set which they called the TV 85. It was an attractive console model in which they had put all the latest developments in television.

The televisor was equipped with a 16" duraluminum disc in which there were 60 lenses similar to the one put out by the Globe Mfg. Co. The motor was a heavy duty synchronous type with a switch for framing on the front panel. The lenses were focused on an opague glass screen on the front that was large enough for the whole family to see. It was protected by a pair of swinging doors that covered it when not in use. Right below this were three panels each with a tunning dial and operating knobs that controlled the various receivers.

Behind the first panel was the television receiver. It had an eight tube T.R.F. circuit using two 235 Multi Mu in the RF circuit, one 224A detector, one 224A, one 227 and two 245's in the audio circuit and a 280 rectifier. The combination was supposed to give a flat frequency response from 15 to 75,000 cycles as well as supply the current to operate the Rawls crater lamp.

Behind the second panel was the shortwave receiver. It was designed for long distance reception from 15 to 200 meters. The circuit was superhetrodyne using nine tubes. To switch from one shortwave band to another required only moving a switch on the panel.

Behind the third panel was the broadcast receiver. It used two 235 Multi Mu, one 224A detector, one 227 and one 227 pentode output with a 280 rectifier. The receiver had an eight inch speaker for reception of the synchronized voice. This seems to be the first commercial set to simultaniously receive the synchronized voice and voice and image with out the operator using a separate radio.



This appears to be the ultimate television receiver that could be used as a single unit and still perform all of the functions of television with a few simple handy adjustment by the viewer. It sold for $295 which appears to be a fair price for a supurb unit but it did not remain available for a very long time and it is doubtful if many were sold.

The maker of Rawls model TV 85 had put it all together with all the things that had been developed to date neatly include in a single attractive cabinet. Now that the engineers had perfected mechanical television, the country plunged into a three to five year deep depression during which television had become too expensive a luxury for the common people. When the economy came out of the slump, television emerged with cathode ray scanning which used practically all of the same features but was able to operate at speeds that never could have been attained by mechanical means and methods.