

TELEVISION

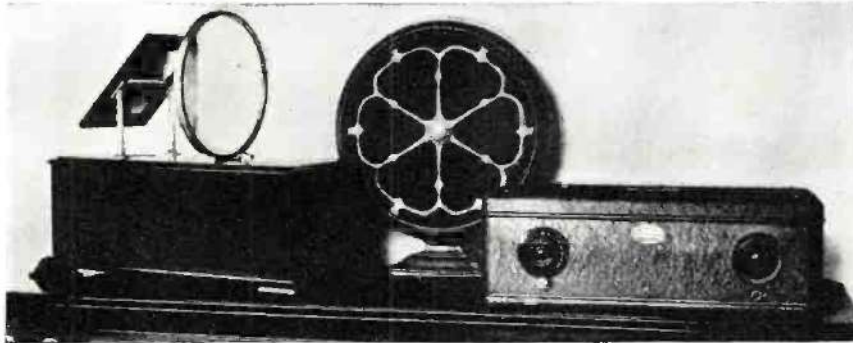
1928

"A TINY BABY"

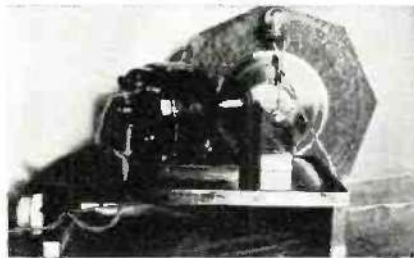
by

AUSTIN C. LESCARBOURA

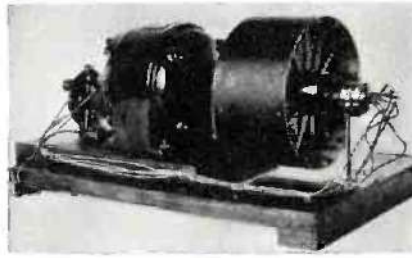
Croton-on-Hudson, New York



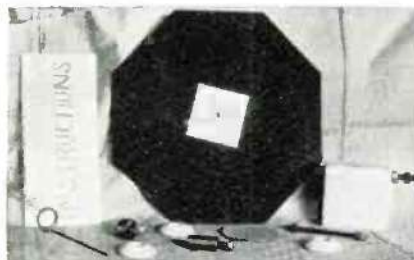
One of the earliest of television home receivers. It consisted of a compact Jenkins drum-type scanner with magnifying glass and an A-K receiver.



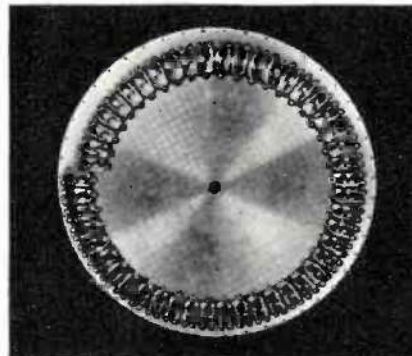
The Jenkins 1928 video receiver as supplied to interested experimenters.



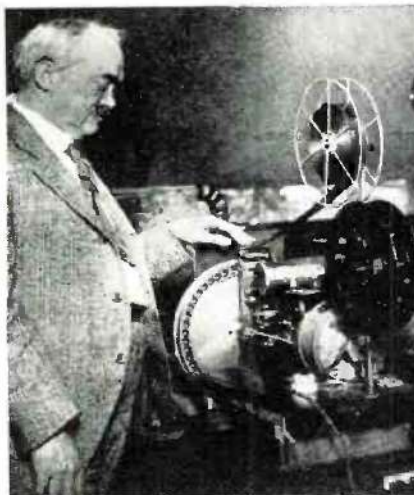
A 1928 Jenkins video receiver made of a revolving drum and a 4-p neon.



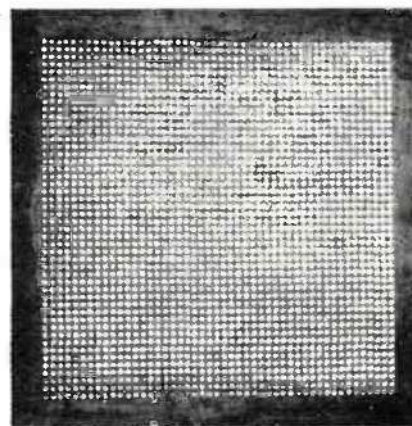
The experimenters kit of 1928 sold at cost. You furnished the motor.



Two attempts at large screen reception. A square of lights and scanner. The disc worked, the square did not.



Dr. C. Francis Jenkins at the telecaster of his station in Wash., D. C.



OBVIOUSLY shy, but overflowing with enthusiasm, was this young woman in black, with babe in one arm and another in tow, as she stepped into our television demonstration booth. Doubtless she had read the more-than-generous newspaper mentions of the advent of television in the Quaker City. If not, she had been guided to our booth by blatant streamers and posters plastering the electrical exposition hall, all screaming the marvels of this television demonstration now serving as pivot about which to swing a very commonplace and dull lot of exhibits. Once again, television was in its familiar role of side show to pack 'em in.

"Is this the television demonstration?" she asked. We nodded. She waited for the next demonstration, parking the offsprings and taking the weight off weary limbs. Presently, she was rewarded. She too saw the flickering pink and black blotches through a magnifying lens, which formed faces and figures after a fashion. It was pitifully crude, this demonstration.

But our audience was supremely happy. Now we were to know why.

"My husband . . . he died just three months ago . . . was a radio man. Yes indeed, John lived and loved his radio. He knew all about it, too. From high school days until he died, radio was his main interest. John kept telling me that television was coming soon. It would be another radio boom, he said. Lots of money would be made by smart people. John had not gotten his share of the broadcasting boom, but he sure counted on making his on television." She paused to wipe moistened eyes.

"John left a life insurance . . . five thousand dollars," she went on, after a sniffle or two. "After paying funeral expenses and a few bills, I decided to invest in something that would make money for the babies and me. The man at the bank tried to discourage me when I mentioned television stock. He had no use for it. But you know bankers . . . they don't know anything, anyway. They have no imagination. Anyway, I couldn't help remembering what John had said about television. So I finally invested our little fortune in the XYZ Television Corporation. I'm so happy that television is

GROWS UP.

TELEVISION is not new! It was a going concern over eleven years ago with stations on the air and "viewers." But it has only just recently come into its own as a perfected industry.

"IN SWADDLING CLOTHES"

1929

now here . . . ready for home entertainment . . . for use in theatres. It's all too wonderful for words. I'm sure we'll get plenty of dividends to keep us going." She was all smiles again.

But not so with us. We were sick, through and through. Although our job was solely that of staging a television demonstration, without thought or regard for the financial or stock promotion of this or any other television enterprise, we nevertheless felt like cads. For knowing the many technical difficulties which faced television progress some eight years ago, we had no illusions about rounding the famous corner.

As for the gentlemen then selling television stock, we had a choice name for them. We had seen them make the only real money which has yet been made in television—something like thirty-five millions of dollars extracted from a gullible public in return for nicely engraved television stock certificates.

I for one turned away from pioneer television in sheer disgust. It was a mean game, in which I refused to take part, once I became aware that all our technical efforts were just so much window-dressing for the stock salesmen.



A very rare picture of an early 1929 telecast from General Electric's WGY studios in Schenectady. In the left background is a tele-receiver.

IF the many financial raw deals in history, few can match television. Never before had such lavish promises been made to an investing public. Never did the public buy on such flimsy presentation. With several other factors, I firmly believe the television stock swindle served to bring about the stringent securities promotion laws which now exist to protect the innocent public from similar fleecings, while unfortunately barring the promotion of worthy if daring ideas.

Television is simply history repeating itself. Television has closely followed the pattern of the radio telephone's evolution into present-day broadcasting. As far back as 1910, the wireless telephone was held up to investors as a powerful competitor to the wire telephone. Stock salesmen were sure that individuals would shortly be using pocket wireless telephones to 'phone one another, incidentally saving telephone tolls. The fact that a roomful of equipment was being used for some demonstrations

"STILL GROWING"

1930

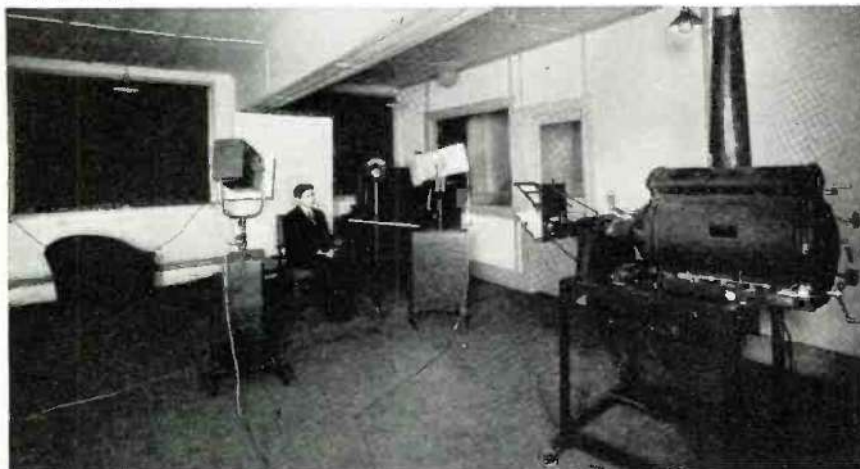


Typical scanner for experimenters sold in 1930. The disk had 60 holes.

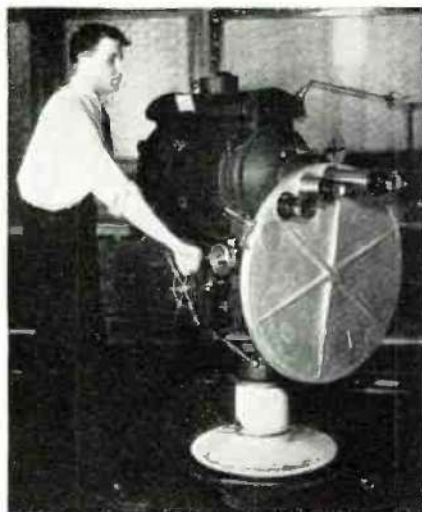


Home tele-receiver of 1930 with its huge magnifying glass and scanner.

1931 "STILL GROWING"



Few know that DeForest was interested in television. A flying spot projector was used in his studios in Passaic, N. J., at W3XCD early in 1931.



A Jenkins-DeForest scanning disc telecaster used at W2XCR, N. Y. C., in '31.



An experimenter's joy of 1931,—a 48 scanning line television kit.

did not chill the enthusiasm of gullible investors who flocked to the brokerage offices to buy stock.

And so the radio telephone earned its bad name. Too much stock was sold. Some of the stock-selling gentry became guests of the Government in those walled-in hotels with barred windows. Soon the wireless telephone dropped out of sight. It sought the seclusion of the research laboratory, there to be reformed and made socially fit for the world. Changing from the carbon-arc oscillator to vacuum-tube oscillator, amplifier and detector, the reformed radio telephone made its second debut in 1915 as a practical means of long-distance communication. That year it spanned the Atlantic from Arlington, Va., to the Eiffel Tower in Paris. A week or so later it covered the distance from Arlington to Pearl Harbor, Hawaii. Vacuum-tube amplifiers made possible the transcontinental telephone circuit that same year.

In rapid succession came the World War, the need for radio telephone communication, peace again, and experiments here and there leading to organized radio broadcasting. Tens of thousands of home-built receivers provided the first audience and encouragement for early broadcasters. Later came a more perfected technique and the justification for mass-produced factory sets. You know the story from there on.

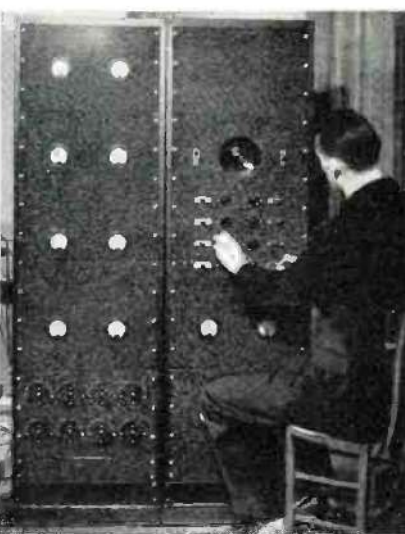
Now television, so far, has followed that pattern pretty closely. And I for one firmly believe, the opinions of television experts to the contrary notwithstanding, that television must continue in the footsteps of the radio telephone.

Reformed television today is at least emerging from the laboratory after the necessary incubation period. It is no longer an experiment, crude-demonstration, far-fetched promise. No longer can it be used for

1932 "A GAWKY YOUTH"



Dorothy Appleby, stage star, is televised in 1932 at New York's WGBS.



An engineer watches the flying disc at old W2XCR-WGBS in New York City.



Just before the collapse of the pioneer efforts, this was the home set.

"FULL GROWN"

1939

sucker bait. Its fantastic stock-selling days are over for good. What with tens of millions of dollars of television stock certificates strewn about a disillusioned land, memories are still too keen to bite again. Which means that television will have to prove its commercial worth first, through the sponsorship of serious organizations, after which it may obtain legitimate financing only as and when such aid is necessary and warranted.

As with the radio telephone, television technique has changed entirely. No longer are neon lamp and scanning disk utilized for weaving intercepted signals into pictures. The cathode-ray tube can do the job infinitely better and with greater assurance of reasonable uniformity of results.

I well recall early television experiments with as few as 24 scanning lines. Only the simplest black-and-white images could be transmitted—just silhouettes at best. Later came the 48-line scanning standard, and we naively believed we had real entertainment possibilities.

Dr. Francis C. Jenkins of Washington, D. C., a television pioneer, proudly showed me his setup early in 1928. He had a 50-watt television transmitter on the air, transmitting experimental programs. Between pictures his operator would cut in with radio telephone announcements. Poor Dr. Jenkins, now deceased, frankly believed he had another broadcasting situation in the making.

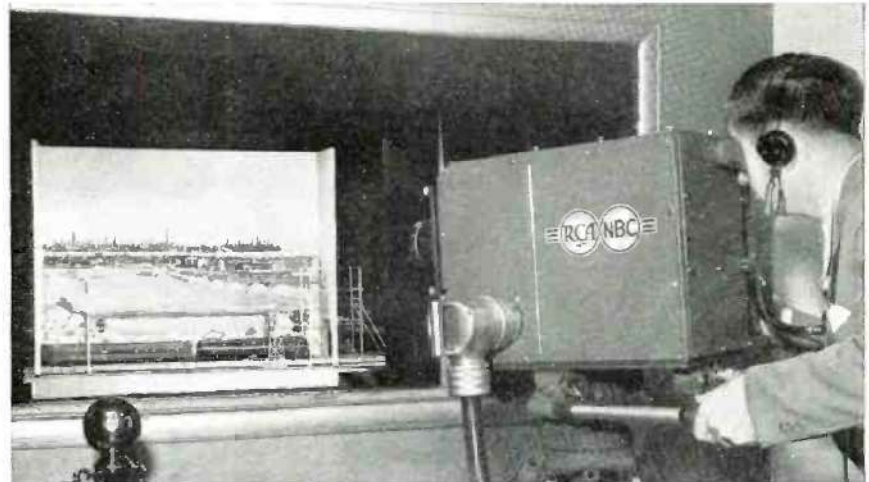
The Jenkins programs consisted of film pickups of simple black-and-white silhouettes—virtually animated cartoons. However, the pictures were actual photographs of live subjects, rather than drawings. The doctor had a 35-mm. or theatre-standard movie camera with which he made short films—about 30 feet at most. He simply stretched a bed sheet across an archway in his home, placed powerful light on the far side, and had his actor in action on the near or camera side. In the absence of light on the near side, the subject was photographed as a silhouette with outline detail and nothing else. Which was about all his crude transmitter and pickup could handle.

I was amazed with what Dr. Jenkins did accomplish by way of public interest, even at that early date. Station W3NK was on the air several evenings per week, on regular schedule. To encourage more lookers-in, he furnished a cardboard scanning disk held by a shaft and wooden bearing, and driven by friction by any small AC or DC motor, together with a so-called "bug lamp" or inexpensive neon night light. The receiving disk was synchronized with incoming signals merely by shifting the friction drive. Of course pictures were obtained—just as you can make photographs with an ordinary shoebox pierced with a pin-hole and holding a piece of bare film.

Fan mail came in from all parts of



When Toby Wing was televised by Philco, she was the first person who was able at the same time to see just how the received picture looked.



Models are in great demand at the studios and look just like the real thing. Here a "fast express" will appear to hurtle across your screen.



An exclusive shot of a musical setup at the West Coast Don Lee Telecast Studios. Special makeup is used by all who participate in the broadcast.

the East—letters from Montreal, the Mississippi valley, Georgia, Florida, New Orleans, and many points nearer Washington. Yet all the little station had to offer were these simple silhouette pictures showing a little girl bouncing a big ball, a darky chasing a synthetic chicken, or a juggler in action.

Later Dr. Jenkins' efforts were made the basis of a large television corporation. Much stock was sold. Capable engineers were put to work. Most of the efforts were aimed at demonstrations to interest stock salesmen and brokers and ultimate investors, primarily. Tens of thousands of dollars were spent for a single demonstration. A whole room was packed with costly and intricate pickup, amplifier and allied equipment so that a screen-sized picture could be reproduced for a stock-minded audience. Nevertheless . . .

This organization did go on the air with the first television station in the New York metropolitan area, W2XCR in Jersey City. Unfortunately, its several kilowatts of transmitting energy never got much beyond the immediate vicinity. The peculiarities of television transmission were still a mystery.

Later, through an affiliated company, a second station was established at Passaic, N. J., W2XCD. For a time I had charge of the programs for that station. My assistants and I scoured the Gay White Way in search of hungry actors—hungry for publicity and often for a meal. Our "lizzie" made regular round trips between New York and Passaic, bringing talent back and forth. The station was on the air six evenings a week, with scheduled programs featured in the radio sections of newspapers. We subscribed to a non-theatrical film exchange for a steady flow of film subjects. Later came a more convenient setup on Fifth Avenue, New York City, with a sound tieup through a regular broadcasting station, WGBS.

With many kilowatts of power, plus a good deal of advanced engineering, the later stations reached out an amazing distance. Our video signals were around 100 meters, rather than the very short waves used today, which made for a pretty broad coverage. Fan mail came in from Canada, the Middle West, the South. Hundreds of letters were received each week. A sound channel immediately below the sound broadcast band, or around 192 meters, made it possible for any standard broadcast set to be used in tuning in the sound counterpart of our visual programs, for the sight-and-sound entertainment. Later came the WGBS standard broadcast combination.

Thousands of amateurs and experimenters went to the trouble and expense of building their own television receivers. They had little synchronizing difficulty when operating with synchronous AC motors on the same power supply as our transmitter. Later, our engineers developed a neat
(Further growth on page 48)

The VIDEO Reporter

by W. C. DORF

THE lid comes off television with the opening of the World's Fair April 30th, and the announced plans of NBC to start a regular telecasting schedule. Is this to be the real McCoy or just a splash, a series of ripples and then all's quiet on the television front for several more months? It is the opinion of this column that it will be the beginning of a new era in radio. True, its expansion will be slow, which will in itself be a healthy sign. The general radio fan may turn out to be somewhat of a cynic, hesitant to extend due allowances to the art for finding the proper answers to the many difficult problems that still face television. Radio fans (not all, but a great many of them), have become so accustomed to accepting the numerous advances in radio over the last 15 years, that they may look for a finished article. It is a finished product as far as transmission and reception is concerned, but what about program set-up, who pays the bill, coverage, etc.?

The pessimists will have to admit that television has never before made such worthwhile progress, such impressive strides as it has in the last five years. To recount only a few, review the advancements in cathode-ray tubes, the iconoscope or television camera, transmission equipment and technique, television receivers, the new u.h.f. tubes for the receivers, special antennas both for transmission and reception, and so on. Just over the last year there has been a notable improvement in the definition and detail of the images as received on a modern telereceiver. What does the future hold in store for television? Jules Verne or his brother might answer this question.

However the public will not have to wait.

Philco Joins Up

PHILCO RADIO AND TELEVISION CORP. recently demonstrated in New York City, a portable television transmitter weighing only 450 pounds. It is designed to be rolled in or outdoors by a couple of men and can be used to televise spot news, athletic events or a studio program. At this demonstration the new Philco tele-receivers using a 5 inch screen were also shown. The sets are to be ready and on the market about May 1st. This column will have the complete data on the new line in the next issue.

New Producer for NBC Tele Staff

ANTICIPATING the beginning of a regular television service for the New York City area in April, the National Broadcasting Company today added Thomas L. Riley, one of radio's well known producers of dramatic shows, to the NBC television program staff at Radio City. Riley brings to television a wide experience in sound broadcasting, a brief newspaper record and experience in the theater.

The latest addition to the Radio City television staff follows the announcement that Max

Gordon, noted Broadway producer, will advise and assist NBC in the production of television programs. A statement issued at the time said that Mr. Gordon had agreed to accept the appointment because "he feels that television offers the entire field of the theatre's vast possibilities."

"I hope to prove to theatrical people," said Mr. Gordon, "that television is the greatest supplementary medium for their abilities. It cannot hurt the theatre. In fact it will help and I am anxious to complete plans for our first television program so that I can invite the leading personalities of the theatres to see it. I am sure that it will convince everybody that my enthusiasm for television is justified."

Thomas H. Hutchinson, NBC director of television programs, plans to put several of his more ambitious program items into rehearsal at an early date so as to familiarize the production staff with the numerous physical changes in studio set-up now being completed at Radio City.

Announces

Television Antenna

THE Andrea Radio Corp. introduces a new television antenna kit. It is called the *Teleceptor* and is featured as lightweight, easily assembled and mounted. Supported on 3½ ft. arms, the *Teleceptor* rods are mounted on a coupler unit of "Climate Sealed" design which protects the terminals from rain and carbon smoke deposits. The mast is of two 4-ft. jointed sections. Additional sections are available if extra height is required. 75 ft. of special television lead-in cable are supplied, together with insulators and accessories. The range of the little transmitter is a bit over 175 feet, but the definition of the picture is excellent.



Philco demonstrates its new, wholly portable television transmitter.

5 Inch Tele-Tube for Small Cabinets

A NEW "Stubby" 5-inch cathode-ray television tube incorporating several new features has been announced by the National Union Radio Corporation. The latest addition to the Videotron family, type number 1805-P4, is a streamlined, compact affair measuring 13-inches in length—3½ inches less than earlier designed units with the same size screen.

The 5-inch *Stubby* offers especial advantages for adaptation to small cabinets. Electrostatic deflection is utilized and images are reproduced in black and white.

Amos 'n' Andy's Big Experience

AMOS 'N' ANDY, in blackface makeup, were the subjects of an experimental television pickup at the grounds of the New York World's Fair 1939 on February 27, the day the famous NBC entertainers broadcast their half-hour description of the big show's wonders.

The experiment marks two more "firsts" for Amos 'n' Andy—the first television experiment with a commercial program to come from the World's Fair grounds and the first time for the
(More video developments on page 49)

Dealers! Servicemen! Amateurs!
Soundmen! Builders!



FREE

ALLIED'S Spring RADIO CATALOG

JUST OUT—SEND COUPON!

EVERYTHING IN RADIO AT LOWEST PRICES



NEW SETS!

New KNIGHT Radios, with Push-Button, built-in "All-Magn" aerials — at new low prices! 20 models — Portable, AC, AC-DC, 110, 6, and 32 volt, etc., as low as \$5.95! — and radio's biggest line of record players, phonographs, photo-radios!



NEW SOUND!

New P.A. values for every purpose! 6-65 watts — Monitor, Speakers, Remote Control, de luxe and standard models — permanent, portable, and mobile — and complete line of relaying equipment, discs, etc!



NEW KITS—PARTS!

More than 14,000 parts! New Build-Your-Own Kits: Melanor 1, 2, 3 tube, new "Pie-Wees"; Television; Mystery Phone and Mike Kit, and many others. Write for Free Parts List, New Builder's Handbook for beginners, 10c plus postage.



NEW HAM GEAR!

Giant new Ham section — all new station-checking equipment to meet F.C.C. regulations. Rotary Beam Antenna; Gen. Television Kit; New Hallcrafters, Howard, R.M.E. Models — all leading lines at lowest prices! See what's new in ALLIED'S new Catalog!

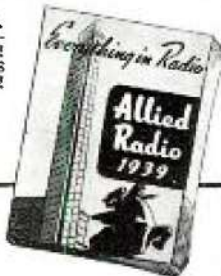


NEW TESTERS!

All leading lines! See new equipment with provision for new Loctal Tubes, etc. — Tube Checkers, Set Testers, Analyzers, Oscilloscopes, Motors — and over 14,000 parts at lowest prices!

Fastest Service,
Highest Quality, Low-
est Prices always!
Write for ALLIED'S
new Spring Catalog!

Free!
SEND COUPON



ALLIED Radio Corp.,
Dept. I-E-9,
833 W. Jackson Blvd.,
Chicago, Ill.

Send me your new FREE Spring Catalog.
 Enclosed find 10c (plus 3c postage) for Builders' Handbook.

Name

Address

City State

Television Grows Up
(Continued from page 10)

little auxiliary motor which, reacting to the advancing or retarding effect of our synchronizing impulses included in our carrier, made good synchronization possible beyond our common power supply.

Crude? Admittedly so. Entertainment? Negligible. Commercial possibilities? Very weak. All that was true of television up till 1932, when it suddenly went into voluntary hiding after the stock promoters had cleaned up.

Nevertheless, I do believe that television could have been put over at that early date, even with the limited scanning disk technique, had the approach been purely from the commercial rather than the stock-selling angle. I well recall my reactions one evening when viewing a program from our Passaic W2XCD transmitter at some 6 miles' distance. We were broadcasting a couple of singers. Pictorial detail was good. Sound was even more so. Then followed a typical motion-picture pickup. One scene showed an auctioneer in action. We could see the different articles he was holding up—a watch, a clock, a bracelet.

I was sold on commercial television that evening. I went home firmly convinced that television, as a home-built-set proposition, was here. But . . .

The stock-selling game collapsed. Money which had been raised never seemed to percolate to the engineers in sufficient quantity to make that last hill. Early television enterprises folded up. The public was left with bulging portfolios of stock certificates. *The stench was appalling.*

About two years ago, television once more poked out its neck, turtle-like. It sniffed the air. The stench had by now blown over. Anyway, television was henceforth being sponsored by RCA, NBC, Westinghouse, G.E., Paramount, and other top-flight organizations. Hog-wild stock-selling was simply out of the question with such backing.

During the past twelve months, NBC has been engaged in experimental broadcasting from the Empire State Building in New York. Cathode-ray technique is employed at both pickup and receiving ends. The present scanning standard is 441 lines, 24 pictures per second. Pictorial detail is wonderful, without flicker. The entertainment value leaves very little to be desired even at this early date. It is a brand new, refined, commercially-feasible television.

As with radio telephony, television has been through hasty laboratory experimentation, premature birth in everyday life, the sucker-bait stage, terrific disgrace, retirement to the cloistered confines of the research laboratory, and renaissance in refined form. Television is precisely where the

radio telephone was in 1920, when Station KDKA of Pittsburgh went on the air with its first scheduled programs, and handymen and boys all over the East hastened to build their own radio receivers.

But where do we go from here? Simply in the footsteps of sound broadcasting. To think otherwise is to deny that history repeats itself.

Television is really ready. It is good home entertainment. There is a potential demand for it. Television, like broadcasting, can be that *new thing* which will put many men back to work in its own right, and give America that much needed shot in the arm that will once more enthuse Americans to *get going*.

We have got to have regular television programs. The present experimental license basis won't do. Under such license, the station is under no compulsion to broadcast. It can go on with a program today. Tomorrow it can simply broadcast a meaningless pattern or trademark hour after hour. The next day it can shut down, without notice, because it wishes to make certain changes.

Hundreds of factory-built television sets have recently been sold in New York City. Radio shops, sporting goods stores, department stores, restaurants, hotels, clubs—these and others have bought television sets to demonstrate television. And yet the only source of programs has shut down for weeks at a stretch. Under which conditions any television set is worthless.

Regular programs are going to be demanded. Broadcasters will simply have to provide them—by popular demand. Sets are going to be home-made or kit-assembled in the majority of instances. Amateurs and experimenters will once again provide invaluable collaboration. Television coverage at first may be limited to a couple of dozen miles' radius from lofty transmitters. No matter. There will be plenty of folks to "look in" within such limited metropolitan areas. Later will come technical and economical means for "piping" programs from network studio to affiliated television stations, regardless of the cost of coaxial cables or relaying transmitters. It *can* and *will* be done.

Pretty soon we shall have a radio boom all over again. There will be tremendous enthusiasm. Millions of dollars of components and tubes and cathode-ray tubes will be sold. Hundreds of millions of dollars of factory-made television sets will be sold.

THE little mother in black, now penniless, but her children pretty well grown up, will sigh again with the satisfying thought that John, her late husband, was a far-sighted radio man after all. That this is an entirely new television setup with about as much similarity to earlier television as today's automobile bears to a 1920 jalopy, will go unnoticed. People are just like that.

Video Reporter
(Continued from page 10)

team ever to face a television camera. Grover A. Whalen, president of the New York World's Fair 1939, took part in the television experiment as well as the broadcast from the fair grounds, when he pointed out the sights to the visitors from a mythical Harlem.

Tele-Casts

THE Farnsworth Radio & Television Corp. plans to take over the factories of the Capehart company at Fort Wayne, Ind., and the U. S. Radio & Television Company at Marion, Ind., as well as the laboratories of the former Farnsworth organization at Philadelphia.

E. A. Nicholas, former head of the RCA license division, will head the new company as president, and Philo Farnsworth will be vice-president in charge of research. Ray Cummings, for years in charge of transmitter engineering and design for General Electric and RCA, will be assistant vice-president. The new Farnsworth corporation plans to manufacture television receivers and transmitters under the Farnsworth patents.

Allen D. DuMont Labs, has an elaborate lithographed two-color 2½x3½ foot wall chart showing a large cross-section view of a cathode ray tube with lettered components and corresponding explanatory notes. A dozen typical screen patterns with brief explanations, cover the various broad applications of the tube. The chart is particularly applicable for use in classrooms, and servicemen's gatherings. There is a charge of 50 cents for the chart and for additional information write to the above company, Passaic, N. J. This same company have just printed a new 1939 catalog on cathode ray tubes for oscillograph and television purposes, that can be had for the asking.

Television reproduction was not very flattering to Gov. Lehman, Mayor LaGuardia, and District Attorney Dewey at the annual dinner of the Inner Circle, New York's political writers association, recently held at the Waldorf Astoria. Probably the lighting or some technical detail was out of step. This is certainly excusable considering the fine tele demonstrations which have taken place in the last month.

The radio parts industry looks forward with a great deal of optimism to television's official bow at the end of this month. A television receiver consists of a great many parts, i.e. ten or more controls, numerous resistors and condensers and other parts, all of which is good news to the industry and likewise to the radio parts jobber.

Prof. H. H. Sheldon of New York University has just started a fifteen week lecture course in television.

Andrea Receiver
(Continued from page 24)

because, once adjusted, they need no further attention.

The front panel carries the loudspeaker. This can be separated from the chassis by pulling out a plug which fits into a small socket on the chassis.

From the video and sound carriers included in a 6-mc. television channel, a 6J5 oscillator tube produces the separate video and i.f. frequencies. The video i.f. is fed through two wide-band amplifiers using 1852 tubes, into a 6H6 second detector and synchronizing clipper. Next comes the 6V6G amplifier which controls the brightness of the spot in the picture tube. The clipper portion of the 6H6 feeds one 1852 sync. separator, the output of which goes to two 6N7 deflection oscillators (vertical and horizontal). Each of these feeds a 6F8G push-pull deflection amplifier, connected in turn to the picture tube.

The 1852 sound i.f. amplifier goes

into a 6SQ7 second detector on AVC, then from a 6V6G amplifier in to the loudspeaker. Voltages for the vacuum tubes and the picture tubes are supplied by a 5V4G and 879 rectifier tube.

The Teleceptor television antenna is constructed of a two-piece mast, 8 ft. high, carrying at the top a wooden block which supports two lateral wooden arms, and serves as a mounting for the Telecoupler. Brass rods, constituting the di-pole, are fastened to the Telecoupler, and are braced by insulators on the wooden arms. These arms have been found essential not to brace the brass rods, but to keep them from whipping around in the wind. This arrangement may not be as pretty as the unsupported rods, but it does eliminate any tendency for the wind to cause a modulation of the received images.

The Telecoupler of porcelain, is sealed against the weather and the accumulation of carbon soot deposits. From this unit, a special twisted pair lead is brought down to the receiving set.

It is easy to mount this antenna, for the complete Teleceptor is so light that it can be held at arm's length. Several mounting devices are supplied, to take care of all contingencies.

Generally, the Teleceptor should be mounted as high as possible, for the gain in signal strength more than offsets the loss due to increasing the length of the lead-in. Best reception is generally obtained with the rods at right angles to the line of reception. If reflections are received, they can be eliminated usually by swinging the rods until the reflections disappear.

-30-


Andrea

"SHARP-FOCUS"

TELEVISION

Ready for Experimenters, Set Builders, Servicemen

Frank A. D. Andrea, famous radio pioneer, now leads in television progress! You may be confident of success with the KT-E-5 kit. It is a product of the Andrea television development laboratories, whose equipment and personnel are among the finest in the world. —When assembled from the step-by-step instructions, your Andrea KT-E-5 will give you the same "Sharp-Focus" images that have amazed television engineers during New York demonstrations. —Be the first in your neighborhood to build an Andrea "Sharp-Focus" receiver.



Complete to the Last Detail
Manufactured by Andrea Radio Corp.

5" picture tube, 16 set tubes, 441 lines, 30 frames interlaced, 44-50 and 50-56 mc. tuning, chassis and base-plate holes stamped, R.F. unit assembled and wired, 6½" speaker, step-by-step instructions and wiring diagrams in 5 stages assure successful assembly. KT-E-5 kit only, \$79.95, picture tube \$27.50, 16 set tubes \$27.50, Teleceptor antenna \$9.50.

Prompt Service on Mail Orders

HAYNES-GRIFFIN Authorized Andrea Dealers
373 Madison Ave., New York City

YOUR FUTURE IN RADIO TELEVISION

• These growing industries need trained men for sales, service, operation. Your chance for employment and advancement depends on thorough training. National Schools offer you time-tested training. Complete, modern facilities and equipment in the largest trade school in the West. Established 1905.

NATIONAL SCHOOLS
4000 S. Figueroa Street, Los Angeles

NATIONAL SCHOOLS, Dept. 5-RN, Los Angeles
Please send free Radio and Television Booklet.

NAME _____ AGE _____
ADDRESS _____
CITY _____ STATE _____

SOLAR

gives you **MORE** for your money

MINICAP



MINICAP
DRY ELECTROLYTIC

Catalog upon request

SOLAR MFG. CORP., 598 Broadway, New York