WHAT 1935 HOLDS FORTH FOR TELEVISION *and* FACSIMILE

The expressed views of leaders in these fields contain forecasts of near-future public services

Television to Come Through Facsimile Studies

David Sarnoff
President R.C.A.

MY faith in the future of radio science is geared to facsimile. The facsimile is the gateway to television. Since Morse invented the telegraph there has been no radical improvement for telegraphy. His alphabet has been in international use ever since, but now we are on the threshold of the first great advance in the art of telegraphy. We are sending pictures and printed matter through the air, and have found the key to speed the traffic. No longer must the message be broken down into hundreds of dots and dashes. It is reproduced by light "brushes" that "paint" it line for line. The next step is to flash the complete picture. The first logical step, of course, is to transmit still pictures and print; that is facsimile radio. The next step will be to send moving pictures; that is television. But before all this could be done a speedy medium of communication had to be found. Marconi discovered it in micro-waves, tiny waves in an ethereal spectrum unaffected by static and fading. The study of television has aided facsimile broadcast and what has been learned by facsimile research has advanced television. I am certain that progress will be extremely rapid.

Television Could Come Out of the Laboratory Stage: Facsimile Is Ready Now

John V. L. Hogan
Consulting Engineer

ON the eve of many new developments in radio broadcasting, a natural question arises in the minds of the public. "Why do we not have television broadcast service today?" Of course, the fact is that there are television stations in regular operation at present, but all of them are operating experimentally and none render a true program service for observers. To my mind, the real reason that no such program services are available to broadcast listeners is due to the fact that so far there has been no coordinated plan incorporating the essential elements of such a service. These three elements are: first, an adequate television transmitter having good coverage; second, a source of interesting program material to be televised; and third, a supply of television receivers that can be widely distributed at a reasonable price and which will give sufficiently good reproduction of pictures to satisfy the user's desire for a service rather than merely appealing to his curiosity.

1935 to See Actual "Commercial" Television

Dr. Lee de Forest

I AM very confident that 1935 will see actual "commercial" television in the home, giving a 200-line picture, black and white, 18 inches to three feet square. And it will not be by cathode ray. Given this, "flash" facsimile will, of course, be realizable upon the same screen, but whether it will prove commercially profitable to put recorded facsimile in the home appears to me debatable. As to its engineering possibility, there can now be no doubt whatever, by any of at least three proven systems. It will be simply a question of economics.

The numerous long-foreseen problems of how to make television pay its way to popularity must be faced. These can all be successfully solved.

Big Future for Television Seen

The Rt. Hon. Lord Selsdon, P.C., K.B.E.
Chairman of the British Post Office Television Committee

I AM visiting the United States to study, and inquire about American television. My mission is to find out just how much progress has been made, inform the British Government about it, and it will subsequently be determined as to what the B.B.C. and British Post Office should do with it insofar as television transmissions are concerned. It is apparent that we must find out all we can about the art of visual broadcasting before applying it on a mass scale. There is a sustaining public interest in England in the present B.B.C. picture transmissions which are, however, still experimental. That there is a big future for television is obvious, but it is difficult to say when it will be accepted by the general radio audience.

TELEVISION VS. ECONOMICS

Dr. Lee de Forest says that television can now be accomplished, technically; that it is merely an economic situation which holds up regular television services

STUDIES AMERICAN TELEVISION

The Rt. Hon. Lord Selsdon visits America on a television mission for the British Government

Images at Least 2 Feet Square

William Hoyt Peck
President, Peck Television Corp.

TELEVISION is already here. It meets all the requirements laid down by critics, at least as far as my system is concerned, which will provide images up to two by three feet, with detail comparable to that of home motion pictures, and bright enough to be clearly visible in a room containing two or three floor lamps.

"Mechanical scanning will, in my opinion, be the most popular system. It affords a more sharply defined picture element than does the cathode-ray tube; replacement of light source is necessary at longer intervals and costs but ten cents instead of many dollars.

Electron Multiplier Helps Television

Dr. R. C. Hergenrother
Television Laboratories, Ltd., Inc.

DEVELOPMENT of completely electronic television methods has reached the point where excellent quality images of

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JOHN V. L. HOGAN

the dielectric and the thickness of the dielectric, or separation between the plates. Since most solid insulating materials require more voltage to break them down than air does, a condenser built to stand a certain voltage can be built with the solid dielectric thinner and therefore more compact than if air were used for the dielectric. For instance, in a certain paper-dielectric type condenser having a maximum d.c. working voltage rating of 1000 volts, the paper dielectric is .003 inches. In an air-dielectric variable condenser rated at 1000 volts, the air dielectric or separation between the plates is .025 inch, over 8 times as much.

The thicker the dielectric is made, the greater is the breakdown voltage. Factors which affect the breakdown voltage of dielectrics will be discussed later when studying these dielectrics. As we shall see later, the greater the separation between the plates, the less is the capacitance of the condenser. Thus these two factors conflict, for while manufacturers would like to make the dielectric as thin as possible in order to make the condenser more compact and cheap, the dielectric must be made thick enough to stand the voltage which the condenser will be called upon to withstand in service.

Capt. Hall's Page

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York City, in answer to a reception report sent KAY, Manila, on July 17. We were patiently awaiting a veri from there, but in its place arrived this communication from New York. Here is what they said, in part: "This will acknowledge receipt of your letter dated July 18, in which you report the interception at 15:33, G.M.T., July 17, of radiotelephone transmission from KAY." Then they go on to say that the power of their station varies from one to forty kilowatts, according to transmission conditions. Usually a directional antenna is employed. These communications are considered "point-to-point" and therefore "we may not supply any confirmation of material transmitted by our station." After waiting four months we receive this reply to our letter, which had gone all the way to Manila and then back to New York, to be answered. In other words, *Manila does not verify!*

From Java we received information on their short-wave broadcasting stations, also their commercial phone circuits. Short-wave clubs in the Far East possession of Holland have sixteen assigned wavelengths, the lowest being 86.46 meters and the highest 163 meters. Short-Wave Concession Broadcast Company, NIROM, has from 49.02 meters (YDA) to 196.1 meters. These stations broadcast from 3:30 to 6:30 a.m., 10:30 a.m. to 4 p.m., 10:45 p.m. to 11:45 p.m., Eastern Standard Time.

The Javanese phone stations, which broadcast occasionally, using directional aerials towards Europe, America, Australia ant the Far East, are: PMA, 15.51 meters, 40 kw.; PLE, 15.93 meters, 40 kw.; PMC, 16.55 meters, 40 kw.; PLP, 27.27 meters, 2 kw.; PMN, 29.24 meters, 3 kw.; PLV, 31.90 meters, 80 kw. All these stations are in Bandoeng. In Medan they have YBG (28.76 meters) and in Makesser, PNI (34.19 meters). Both stations have only 3 kw. power. A sharp-eared tuner is liable to run afoul of one of them most any morning. Java verifies all correct reports.

Capt. Horace L. Hall

Skip Band Set

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section comprising a regular plate, grid and the common cathode also used for the diode sections. The amplified a.f. signal works into a resistance-capacity coupled audio power stage employing the type –42 tube, V5

The grid-return leads of i.f. transformers IF1 and IF2 do not return to ground directly, but run through resistor R2 and the entire resistance of potentiometer R1. This connection places the cathode end of R1 at positive potential and the opposite end at negative potential. Negative bias for the control grids of the i.f. tubes V2 and V3 is thus obtained because of the voltage drop through R2 which occurs during the detecting-rectifying action.

For a given signal, let us assume that the drop across R1 is enough to bias the controlled tubes V2 and V3 to a sensitivity consistent with desirable reception volume. A decrease in signal input causes a decrease in voltage drop across R1. This automatically lowers the bias on V2 and V3, and the sensitivity of the i.f. amplifier increases accordingly. Conversely, a stronger input signal increases the voltage across R1, biases the the i.f. tubes more negatively, and the receiver sensitivity decreases to hold the receiver output level constant. This entire action constitutes a system of effective automatic volume control.

Without some sort of manual audio control, the receiver would always be working at peak output. Any desired volume level is maintained by adjustment of the knob of R1, which allows all or any part of the rectified signal current to pass to the audio section of V4 for amplification and eventual reproduction.

The field winding of the 5½-inch dynamic type speaker serves as the filter choke for the power supply. The power pack is of standard design.

The small size of this receiver makes it ideal for installation in a book-case and in a wide variety of mantel or small console cabinets. The sensitivity, selectivity and tone quality of the receiver are more than adequate for all ordinary requirements, the crisp, lifelike reproduction of voice and music being especially impressive when the speaker is fitted to a baffle of respectable size. *The above statements by the author on the operating ability of the set have been borne out by tests conducted in the* RADIO NEWS *Laboratory.* A kit of parts for building this receiver has been made available by Wholesale Radio Service, Inc.

What 1935 Holds for Television and Facsimile Transmission

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three hundred or more lines may be picked up out of doors or in the studio, with about the same light intensity as is required for talking movies. Recent development of a new type of cold-cathode vacuum tube called the "electron multiplier" has led to greatly increased sensitivity of the television pick-up camera and has opened the way to more efficient radio transmission and reception of television signals. Television is still in the laboratory in the United States, but it is not going to remain there much longer.