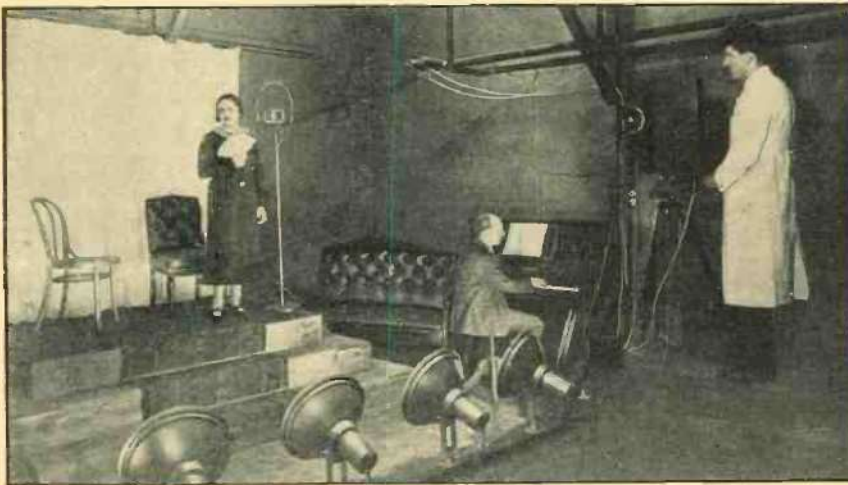


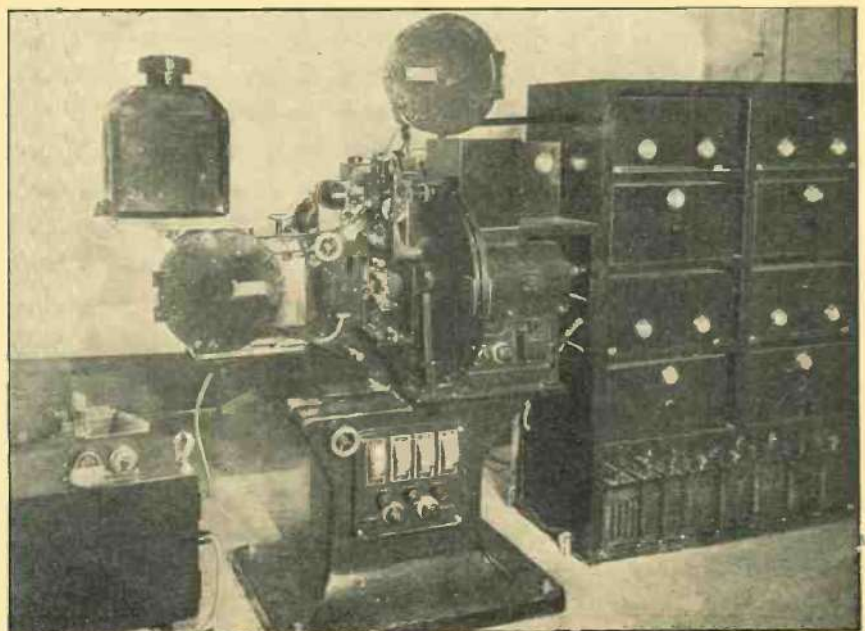
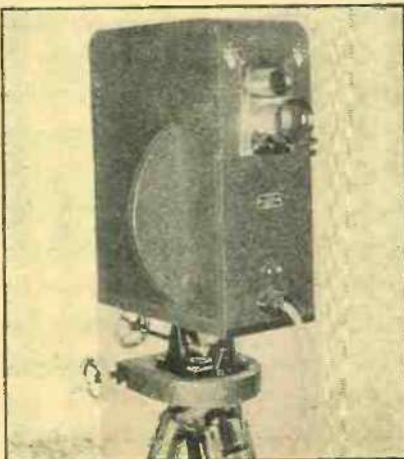
Using Cathode Rays

By Samuel Kaufman



TELEVISION HIGHLIGHTS

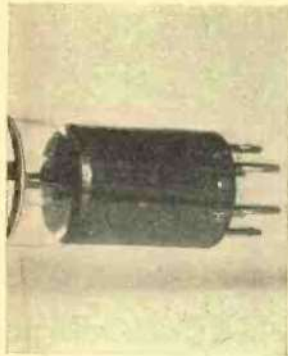
At top: The inventor of the receiving apparatus, M. Barthelemy. Directly above: Making a television "shot." Below: The television camera. At right: The transmitting apparatus employed at the station.



ADDED impetus has been given to the acceptance of the cathode-ray tube for future television development as another new television system, the work of M. Barthelemy, is announced. The apparatus is being utilized to achieve efficient and practical results in high-definition sight broadcasting. Although M. Barthelemy and associate engineers showed no indication of rushing their job, no time has been lost in getting the service started and a working schedule arranged whereby, in easy stages, the high-definition service is assured the public.

This whole new plan is a part of the national television development worked out by M. Georges Mandel, Minister of P.T.T. (Posts, Telegraphs and Telephones) for France, and the Barthelemy cathode-ray apparatus was chosen by

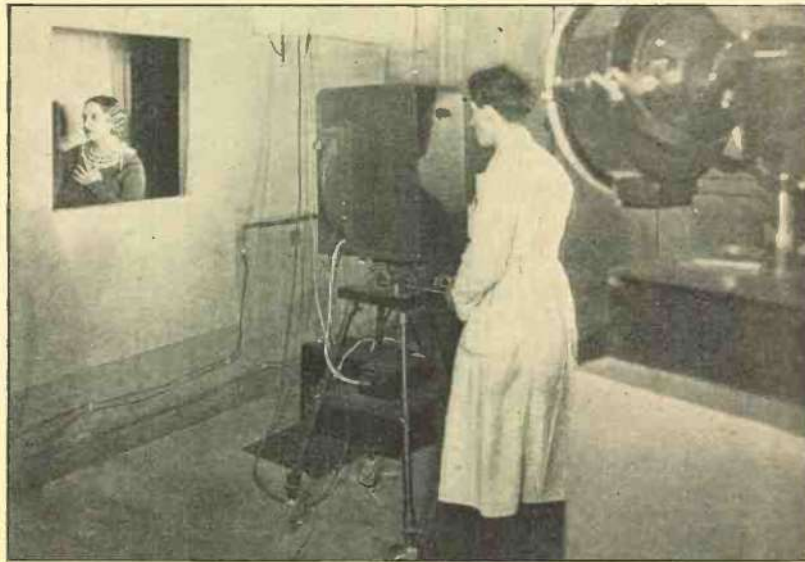
for High-Definition TELEVISION



the Government experts. The launching of the service last spring brought reports that imports of television products into France would rise. But now, French manufacturers indicate that they are seeking licenses to produce types of television apparatus for sale in America and elsewhere pending the development of equipment of domestic design here.

As the initial step in its home television program, Paris P.T.T. first presented 60-line images on the 175-meter channel. A picture frequency of 25 per second was maintained at the beginning, while at a subsequent date, 90-line images were to go out over the same wavelength. And now, in 1935, a 7-meter transmitter yielding 180 and 240-line pictures has been put into service.

The French radio manufacturers asso-



SHOOTING A CLOSE-UP DURING THE FIRST BROADCAST

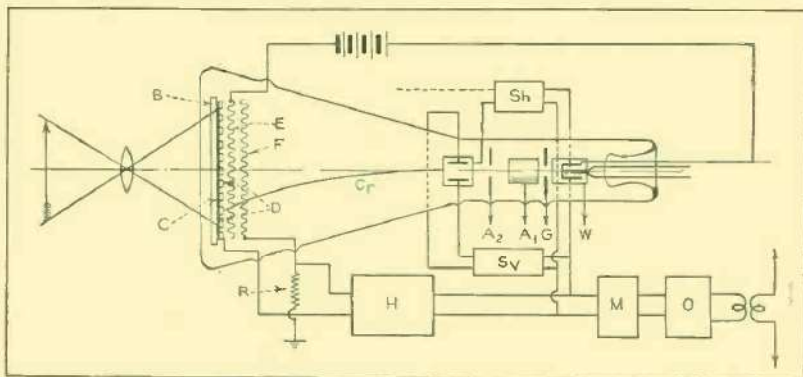
ciation, at the start of the 175-meter television service, issued a strong warning that television should not be taken too seriously. The association pointed out that low-definition services are "out-of-date" and represent systems discovered and available several years ago. The point was made that the early

French television transmissions were conducted merely to aid the radio makers to prepare plans for future production. However, the launching of the 175-meter service, together with the assurance of high-definition transmissions has brought forth considerable enthusiasm from the radio public.

Latest TELEVISION INVENTION

By Victor A. Babits

THE cathode-ray tube, the construction of which is now reaching perfection, has led the development of television into a new direction. The works of M. Ardenne, Campbell-Swinton, Farnsworth, Sabbah, and Zworykin referring to this subject are discussed at several places within recent television literature. A new system of television-transmitter-device, the essential part of which is a cathode-ray tube, is shown diagrammatically in Figure 1. In this new system I have devised, the picture to be transmitted is reproduced on the transparent metal electrode C, this having been coated onto the quartz-plate B by cathode evapori-



NEW TELEVISION CIRCUIT

Here is a diagram of the unique Babits special cathode-ray television circuit.

zation. A granulated blocking layer D is applied onto the electrode by a special procedure. Two electrodes E and F being made out of a dense metal net and being supplied with large surfaces,

are placed parallel to the above-mentioned plane. We connect the electrodes F and C to a relatively high resistance R. Theoretically the layers C and D form a great lot of photo-electric elements being connected parallel, for the light beam, which passes the quartz-plate B and the transparent metal electrode C, brings (Turn to page 107)

erates at a fixed radio frequency of 600 kc. and has a directly calibrated, continuously variable modulated frequency range from 60 to 10,000 cycles. An instrument of this kind should meet a wide demand for production line and acceptance tests, and quick overall selectivity and response measurements.

Everything in The One Carrying Case

This new instrument produced under the name of the "Professional Servicer" by the



Clough-Bregle Company, comprises an all-wave signal generator and a multi-range volt-ohm-milliampere-output meter. The complete equipment is enclosed in a metal case fitted with shock-proof instrument cushions.

Battery Receiver

The latest addition to the Emerson line is a six-tube dual-wave battery-operated superheterodyne. In addition to the regu-



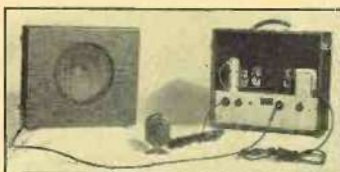
lar broadcast band it provides reception on the short wavelengths from 52 to 19 meters. It employs a permanent magnetic dynamic type speaker.

That Liquid Rubber You Have Been Waiting For

A liquid form of live rubber which is self-vulcanizing is now being produced by the Stewart's Studio. It can be applied right from the can with a brush, like paint, and dries very quickly taking the form of a durable, elastic, vulcanized rubber surface. While this product was primarily developed for use in flexible mold making to cast novelties from plaster, etc., it will appeal to radio experimenters and servicemen, as it is especially suitable for insulating tool handles, insulating wire connections, coils, and thousands of other radio uses which will suggest themselves.

Portable P. A. System

The RCA Victor 6-Watt portable sound system is especially applicable for use in window demonstrations, restaurant call systems, fairs, carnivals, etc. It operates



from 110 volts, 60 cycles a.c. line supply, weighs 28½ pounds and measures 16½ by 16 by 8½ inches. It has provisions for phonograph connections.

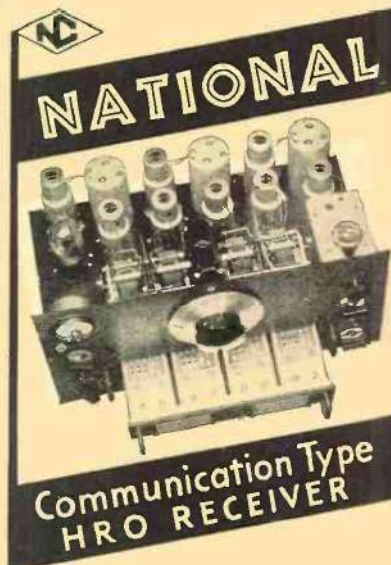
Television

(Continued from page 77)

forth a photo-electric effect when reaching the semi-conducting layer. Now the *D*-layer is granulated and uneven, hence the photo-electric effect can result but in certain points of the surface of the electrode *C*. Sure enough, there exist such parts of the surface, which do not touch the semi-conducting layer. Within these elements of surface no photo-electric effect can possibly develop. Since, in consequence to the photo-electric effect, electrons wander from the semi-conducting granules towards the metal electrode, the electrode *C* receives a negative electric charge, whilst the single granules, which have lost some electrons, are positively electrified. Thus it is evident that the phenomenon taking place in this case is similar to that in the so-called photo-electric elements (blocking-layer photo-cells). As to these, a potential difference results in them, between their conducting and semi-conducting layer, under the influence of light. This case would correspond to a situation, where a great number of galvanic elements of different electro-motive forces are put in contact—by their equivalent poles—with one common *C* electrode. The remaining poles of the elements, which in our case are represented by the semi-conducting granules, stay free. If now we switch the elements of different electro-motive forces, which are due to the photo-electric effect, one after another on the high resistance *R*, then for each photo-electric element we receive a decrease of voltage along *R*, according to the light-flux of the element. We accomplish this switching on of the elements one after the other with the help of a cathode-ray beam. This latter being directed in a zigzag line by the aid of two generators *S_h* and *S_v*, a small spot of this beam makes conducting connection between a group of the granules and the metal net *F*. Thus the electro-motive force, that results from the light influences, causes a current through a circuit, where the resistance of a small part of the cathode-ray beam, the resistance *R* and the internal resistance of the photo-electric element are connected in series. We amplify the decreases of voltage along the resistance *R* with the amplifier *H* and transfer them to the modulator, which then modulates the oscillator *O*. In this tube the cathode-ray beam starts from the cathode, passes the Wehnelt cylinder *W*, the grid and the anodes *A₁* and *A₂* and finally arrives between the two deflecting plates, which control it's horizontal and vertical movement.

The cathode-ray beam, sliding along the surface of the granulated semi-conducting layer, causes electrons to settle down on this plane, which produce a negatively-charged electric field of damaging influence between the electrodes *E* and *F*. This we stop by supplying the electrode *E*, which is also made out of a metal net and which is placed between the semi-conducting layer *D* and the electrode *F*, with a positive potential by the means of a battery, this potential being high compared with that of the emitting layer. The metal, of which the electrode *C*, and the semi-conducting material, of which the layer *D* consist, are both chosen in such a way, that the light-permeable coefficient of the quartz-plate *B* and the metal layer *C* compensate the selective photo-effect arising between *D* and *C*. The thus retained important result is, that a certain change of light-flux affects the same electro-motive force throughout all the spectrum of visible frequencies.

The device described here has, in comparison with the devices already known, the advantage, that the selective photo-effect can be reduced to a minimum, further, that within this system, on account of its relatively low internal resistance, a certain change of light-flux produces a greater change of photo-current, than with other types, i.e., the device seems to possess a higher efficiency than the constructions commonly used.



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