

Demonstrates High-Definition Television

By Samuel Kaufman

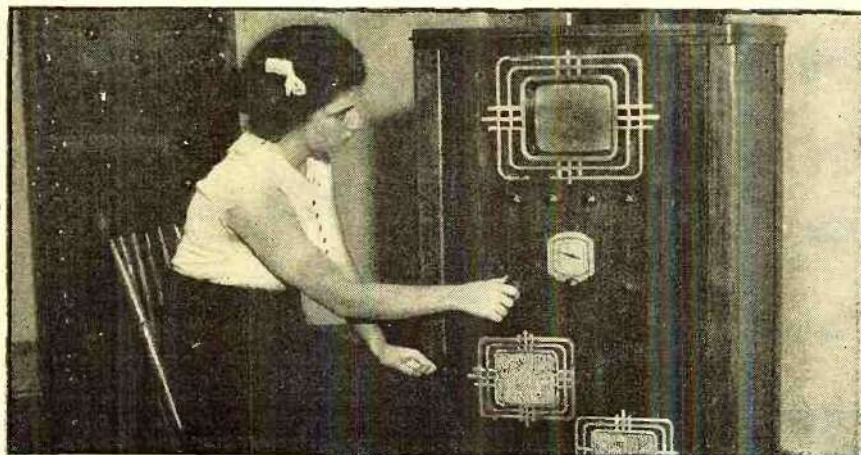
TELEVISION! An economical receiver revealing large-sized images of live and filmed subjects! A row of dancing girls faithfully reproduced after transmission through the ether! An announcer discoursing and a cartoonist at work are viewed as well as heard on a home-type receiver!

A Special Demonstration

A Mickey Mouse cartoon with all of the famous rodent's capers clearly seen after transmission through the air! These were a few of the highlights of a special demonstration to the RADIO NEWS editorial staff at the Philadelphia laboratories of Farnsworth Television, Inc. The special tests were conducted by Philo T. Farnsworth, noted television inventor; A. H. Brolly, his chief engineer, and George Everson, secretary of the company, before the RADIO NEWS group, including Laurence M. Cockaday, editor, S. Gordon Taylor, managing editor, J. C. Meillon, Official Short-Wave Listening Post Observer for France, and the writer. The entire group was impressed with the clearness of images transmitted both through the air and over wires and reproduced on the convex end of a 9-inch diameter cathode-ray tube in a home-type set.

THE FARNSWORTH RECEIVER

Here is a complete receiver for home use, showing the cathode-ray tube screen at top and the high-fidelity speaker system in the lower grill. Tuning can be done by any person who knows how to tune a radio set.



SCENES EASILY BROADCAST
The new Farnsworth system, the pick-up of which is shown at the left, easily transmits scenes such as this in which a number of characters are pictured with high definition.

Progress at the Philadelphia laboratories has gone ahead by leaps and bounds. The inventor said still greater refinements than those we viewed would shortly be applied. He is planning his own Philadelphia experimental station and expects it to be in operation at an early date.

"Television," Farnsworth declared, and his aides agreed, "has advanced to the point of having real entertainment value. We don't intend upsetting the radio industry but will make contributions to it. Interest in television throughout the world has grown tremendously in the last three or four months.

Need for Standardization

"Television has come through with some of the technical perfections but there are a few other things remaining to be ironed out in the art. For one thing, standardization should be done before commercialization. It is obvious that the Federal Communications Commission should apply the order. It is inevitable that all television groups would want it so, in order to clean up obstacles that are now apparent."

The Farnsworth transmitting and receiving systems depend entirely on the cathode-ray method. Two types of valves most in use at the Philadelphia

Laboratories include a 15-inch diameter tube, yielding a 10 by 12 picture, and a 9-inch tube with a 6 by 7 image. Electro-magnetic focussing is employed exclusively, with the coils outside the tube.

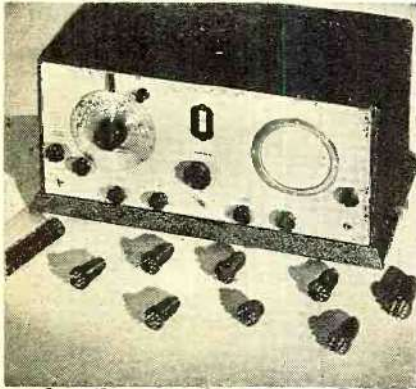
Image size of 12 by 14 is considered ideal for home reception, but the Farnsworth technicians declare that, for home use, a small type high intensity, cathode-ray tube must be used in conjunction with optical projection. This method, they declared, has already been completed. (Turn to page 308)

PLANS TELEVISION TRANSMISSIONS AT AN EARLY DATE

This is Philo T. Farnsworth, who told the author that he intends to erect a television radio transmitting station for experimental purposes in the near future to further demonstrate the practicability of his system for homes.



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The 1936 Super SKYRIDER
with Duo-Micro Band Spread
and 9 Metal Tubes



The 1936 Super SKYRIDER uses the NEW Metal Tubes to full advantage. Elimination of noisy tube shields, reduced inter-electrode capacities and the advantage of shorter leads, make possible greater gain and fewer circuit complications, especially effective in short wave reception.

In keeping with the policy of the **HALLICRAFTERS** to always be first with worthwhile engineering developments, the NEW Super SKYRIDER incorporates a specially designed Iron Core intermediate frequency system—this for the first time in any amateur receiver. Crowded amateur bands demanded a new order of selectivity. Iron core I.F.'s is the answer. The special system used in the NEW Super SKYRIDER also insures greater sensitivity and a signal to noise ratio that is **UNATTAINABLE** with any air core system.*

In the re-design of the Super SKYRIDER, **HALLICRAFTERS** engineers have achieved an efficient five band coverage of all wave bands from 7.14 to 550 meters (41,000 to 540 KC.), made possible through an antenna circuit that is in each case tuned to the low frequency end of each band.

A stellar feature of the NEW Super SKYRIDER is the duo-micro-vernier band spread system. Unequaled accuracy of logging is afforded by this system which combines electrical band spreading and micro-vernier and main tuning dial are illuminated by a novel means.

Full provision is made for the use of either the doublet or the conventional types of antennae.

*See Technical Article Page 36, August Q. S. T. Magazine.

the hallicrafters
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The Ham Shack

(Continued from page 271)

former). The tuning circuit should consist of a coil shunted with a condenser designed to cover the operating band. The diode should be connected in series with the milliammeter and both units across the tuned circuit. Such a device when tuned to resonance will read current when placed almost at any point in the shack, but preferably as far from the transmitter and as near the antenna as possible. The needle will wiggle when modulation exceeds 100 per cent or indicate carrier shift, but will remain stationary when the transmitter's "modulation capability" is not exceeded. Here again it is wise to reduce modulation well below the point where the meter stops moving.

If reasonable care is taken in the adjustment of the transmitter they may adequately serve as means to "insure the transmitter is not modulated in excess of its modulation capability."

Other Regulation Changes

In addition to the forementioned substitute regulation, the Federal Communications Commission widened the 10 meter 'phone band to 1,000 kilocycles, thereby making it the second widest band for telephone transmission. The new rule allocates the frequencies between 28,000 to 29,000 kilocycles to radiotelephony. The commission in announcing the change said: "The effect of the change is to assign one-half of this amateur band for amateur telephone use in addition to amateur radiotelephony."

At the same time that this change in allocation was announced it was stipulated that Rule 382 is changed to read 30,000 instead of 14,400. Therefore, Rule 382 now reads: "Licenses of amateur stations using frequencies below 30,000 shall use adequately filtered direct current power supply for the transmitting equipment, to minimize frequency modulation and to prevent the emission of broad signals." In effect this change bars modulated self-excited oscillators on the 10 meter band.

Another change in the new regulations authorizes the use of the 10 meter band for mobile use. In announcing this change the commission said: "There is considerable amateur interest in being permitted to engage in portable-mobile operation in the 28,000-30,000 band on the same basis as is permitted under present regulations on frequencies above 36,000 kc. These frequencies share with the higher frequencies the characteristic of being a region not commonly employed by the commercial classes of service where interference would not be at all likely to ensue. Amateurs have found the performance of frequencies in the 28,000-30,000 kc. band extremely variable and it is believed that if this band were made available for portable-mobile operation, a great deal more would be learned of the characteristics of this band."

An Inexpensive High-Voltage Power Supply

Cost of high voltage power supplies has tended to retard the universal use of the higher voltage lower current types of tubes which are extremely desirable for the higher frequencies. The idea of using two low voltage transformers and a double rectifier in series has been used by some amateurs, but such units have a double primary and it is seldom that two different transformers deliver identically the same voltage. The Thorndarson Electric Manufacturing Company recently announced a new model transformer which offers a flexible combination of outputs that are ideal for supplying transmitters using the RK-20, 203A, 800, 825 and similar types of tubes. This power unit will furnish 1,120 and 500 milliamperes total current; the filter a 150 milliamperes total current; two separate 500 volt 150 m.a. supplies, or, by paralleling the two, 500 volts at 300 m.a. The circuit eliminates the use of a bridge rectifier which normally is used for such a voltage with low voltage transformers and at the same time permits the use of inexpensive type 83 rectifiers. Two schematic diagrams making use of this transformer (T-7584) are shown elsewhere in this department.

Calls Heard

By Anthony J. Misunas, W9TDW, 319 Grand Ave., Rockford, Ill., on 20 meter C.W.: K6DDN, ON4AU, VK20C, VK2YW, G2NH, G2DV, F8EB, X1DC, X1AY, K5AN, VK2CW and PA0XF.

On 20 meter 'phone: G5ML, G6XR, EA4AO, CO2HY, K6KKP, X1HH, X1W, HI7G, CO6OM, CO2LL, CO2WH, CO1A, VO1I, HI2K.

By J. D. Brewer, WSDCG, 3077 Woodbine Place, Columbus, Ohio, on 40 meter C.W.: CM2AS, CM2FA, CM2GE, CM2JP, CM2JB, CM2OR, CM6RC, CM7CN, D2DH, EA7AO, G2NM, HClFS, H51PI, J5CK, K3ZR (ship ORA wanted by W8DCG) K4BRN, K5AA, K5AC, K5AG, K5AJ, K6AHX, K6CIG, K6GAS, K6HG, K6IBW, K6JFV, K6JUY, K6KDV, K6KTF, K6KUX, K6LEH, K6LEJ, K6LEN, K6LPW, K7ZZK, KA9WX, LU1AB, LU2DP, LU5CZ, NX2Z, PA00Q, SU1AQ, U3UT, VE2GX, VE2GH, VE3BA, VE3NG, VE3QE, VE4FW, VE4KA, VE4NZ, VE5LG, VK10J, VK2DA, VK2DR, VK2DJ, VK2EL, VK2EO, VK2DR, VK2FD, VK2FY, VK2GG, VK2GR, VK2HG.

VK2PE, VK2RP, VK2QK, VK2TH, VK2TI, VK2XJ, VK3BW, VK3DP, VK3GU, VK3U, VK3HT, VK3JK, VK3KR, VK3OW, VK3PB, VK3UH, VK3WV, VK4EI, VK4EL, VK4ER, VK4KA, VK4RP, VK4ZL, VK5EP, VP2NT, VP4TC, W6ACZ, W6AOR, W6BKZ, W6BTM, W6BXB, W6CZU, W6DRQ, W6DPN, W6FOW, W6FYK, W6GRE, W6IED, W6JRY, W6IYY, W6KTH, W6KTO, W6KUS, W6KWA, W6LLO, W6LYM, W7AFL, W7APD, W7APE, W7AT, W7CBL, W7DDU, W7DND, W7DVY, W7ESI, W7EST, W7JL, X1B, BIBT, SID, X1DY, X1H, X1HH, X1R, X2J, X2M, X3AT, X3C, X3U, X3Y, NU2GW, XU2RT, XU8RR, ZL1AR, ZL1DV, ZL1HY, ZL2CY, ZL4BO, ZL4FO, ZL5BO.

By Charles Miller, 309 View Pl., Covington, Ky., on 20 meter 'phone: G2DV, G2OI, G2MP, G2MP, G2MV, G2HN, G5BJ, G5BY, G5BD, G5JT, G5ML, G5NI, G5YV, G5YV, G6GF, G6DL, G6XQ, G6XR, G6QS, G6PY, G5SY, G2TD, G5VL, LA1G, VP3BG, VP3IS, VP6TR, VP6MO, VP6YB, EA4AO, EA4BM, HI7G, HI8X, K4SA, K6BAZ, K6DDN, K6KKP, W1A, T2RC, T23P, T13AV, T13WD, LU1DA, LU1BC, LU3AP, LU9PA, HClFG, VO1I, OA4B, ON4AC, ON4AL, ON4ZA, CT1BY, VP9R, F8CR, F8DR, PA0IDW, HB9AQ, VK2EP, HHSFA, X1F, X1G, X1K, X2AH, X2C. On 20 meter C.W.: OK1FF, OK1LN, OK2AK, OK3ID, E57C, SM7VN, HAF3H, FM4AA, FM8BG, VQ4CRL, VQ4CRP, ON4CSL, EI8B, HI1Q, SP1AR.

By Sam J. Emerson, 1097 Galewood Dr., N.E., Cleveland, Ohio, on 20 meter 'phone: G5NI, VE4LA, K6CMC, VE3DF, LU6AP, VP6TR, CO2SE, HI2K, K4SA, CO8RQ, VE2FG, G5ML, CO2AN, LU9PA, VE5JK, X1G, CO2RA, VE4PL, X2AH, VP6YB, PY2AK, CO2AJ, EA4AO, VE3TD, X1AI, CO5RY, VE4HO, CO2SV, VE2CA, VP5AT, CO8YB, VE2BG, TI3AV, PH1A, T2RC, CO7HF, TI2AV, VE4BF and W10XFP.

Serviceman's Diary

(Continued from page 260)

most likely to be affected by pounding of the r.f. coil shield on the under side of the chassis. Located a small .04 metal encased condenser tucked away in the most inaccessible part of the compartment. Replaced same and the job was done. Delivered the set and called it a day.

Television

(Continued from page 265)

About 200 watts input is required for the entire television receiver.

At our demonstration, 240 lines were used, but Farnsworth intends to increase this to 360 lines and, in turn, to "something in the order of 400 lines." The scanning circuits are operated with hard tubes, no thyratrons being used. A.C. heaters are employed in both cathode-ray tubes. We were told that the tubes are manufactured "for far less" than ordinary cathode-ray oscillograph valves. Also, the engineers declared, none of the experimental tubes have been worn out, and some of them have been in use for two to three years.

Images were presented at 24 frames per second. At an early date, we were told, 48 frames per second will be used. However, this was said to actually mean an interlacing of "two 24's."

Eleven tubes are used in the present Farnsworth receiver. These include one picture-amplifier, one pulse-isolator (or separator), one tube for interlacing, one for high-frequency scanning, two for low-frequency scanning, three in the radio receiver and two as rectifiers.

Farnsworth confirmed his firm's recent tie-in with the Baird group of England and the Fernseh interests of Germany. At the time of our visit, he declared that the European firms were adapting some of his methods, a member of the Baird organization, Captain A. G. D. West, being in the U. S. A. Farnsworth also said that one of his own representatives, R. E. Rutherford, was in Berlin at the Fernseh laboratories.

The inventor expects to get his television receiver down to about \$200 list price, the low figure being dependent on mass production. At any rate, he declared, the cost should be somewhere between \$150 and \$500. It might include broadcast receiving apparatus, he said, but his own policy is against it. "That's up to the manufacturers," he commented. The Farnsworth firm is organized for research and development and will not do its own manufacturing. Instead, it will license various manufacturers. At the time of this writing, non-exclusive licenses have been issued to Philco Radio & Television Corporation, for receivers, and to Heintz and Kaufman, for transmitters. At an earlier date, Farnsworth designed an experimental television transmitter for Philco.