

## TELEVISION IN ENGLAND

Television Transmission

At the present time, there is only one station in England. It is located at Alexander Palace in North London, and is operated by the government (BBC - British Broadcasting Co.). It is rated as follows: vision - 17KW peak (to antenna), 45MC, band 3.0DB down at 2.75 and 6DB down at 3.0MC, 405 lines, 50 cycle scanning. Sound - 3.5KW carrier 41.5MC.

Another station is being built at Birmingham, which is expected to serve as many people as the one in the London area. Its rating will be - vision 34KW, 63.45MC. Sound 14KW, 59.9MC. Except for some local interest programs, its programs will be the same as those of the London station. The two stations will be connected by a relay system. A cable, now being used for telephone service, will be tested out; and if found to have sufficient merit, might alter relay plans.

A third station is being considered for Manchester or Leeds, but nothing definite has been announced.

At the present time, the London station presents a program two hours in the afternoon, and is repeated two hours in the evening on seven days per week. A test program is also presented for one hour each morning.

The equipment for the London station was originally made by EMI and Marconi. The relay stations for the Birmingham-London tie-up is to be made by G. E. Co., the mobile equipment by Pye, and the camera tubes by EMI.

Television Receiving

It is estimated there are 50,000 home receiving television sets in operation at the present time. These are 9" sets purchased before and since the war, and approximately 15,000 12" sets purchased before and mostly since the war. Most of the television activity is in the production of direct vision home receivers. Whatever work is being done on projectors, is still in the laboratory stage.

There is a purchase tax of 66.7% on television sets, in addition to a license fee of \$4.00 (this fee is again in addition to the \$4.00 for a regular sound receiver).

There is a great demand for television receivers, but the supply is limited by the number of cathode-ray tubes that can be produced which, in turn, is limited by the supply of bulbs.

The present trend for all television manufacturers is to try to reduce the price of their receivers. AC-DC series circuits are being considered, but have not been used as yet. Another trend is to try to increase the brightness of the picture by using higher anode voltages. Pye (largest manufacturer of television receivers) are leading in this. Pye uses 6.8 KV and the same circuit on their 9" and 12" receivers. Others are using 5.8 - 6.0KV on the 9" and around 7.0 on the 12". The limitation appears to be the "sticking" voltages.

About seven months ago, at the Olympia Show, it was apparent that the demand was for 12" tubes. Since that time, however, the supply has been far below the demand. At the same time, it was agreed not to bring out any projection receivers.

The average number of receiving tubes, per television receivers, is eighteen. The larger sets use up to twenty-five. Magnetic focusing and deflection are practically universal.

It is difficult to obtain published data and other information on cathode-ray tubes and television receivers. It appears that, because of the shortage of bulbs, the entire program has moved slowly, and manufacturers have not tried to push their products.

Below, are listed the leading television cathode-ray tube manufacturers, together with some comments.

1. Edison Swan Electric - They are making about 270 9" and 180 12" tubes per week, but are slowly tooling up for several times this number, because of the great demand. At present, production is limited by the bulb supply (Chesterfield). They use the blown bulb with the rounded face (bulb cost 9" - \$2.00, 12" - \$3.00). Other details are:  $E_f = 2.0$ ,  $I_f = 1.4$ ,  $E_a = 6KV$  max. Triode gun, British octal base. List price 9" - \$36.00, 12" - \$48.00, plus 67% tax.

They have made 15" tubes experimentally and would make them in production, but to do so would disproportionally limit their production of smaller sizes because of the bulb shortage.

Although they are familiar with aluminizing process, they have only tried it on a few experimental tubes. Their objections to it are that at the low anode voltages in use in England, the brightness of the aluminized tube is too low.

They have made projection tubes experimentally only. However, they plan to develop two projection types in the near future, along the lines given below:

- A. A 5" tube giving a 13" X 16" (20 $\frac{1}{2}$ " diag.) for general home usage.
- B. A tube giving a 16" X 20" (27" diag.) for pubs, bars, etc.

The 27" picture is thought to be too large for most British homes.

Both of the above tubes would be used in conjunction with a Schmidt lense system which might be sold with the tube. These tubes would use an anode voltage of around 27KV, and would have the aluminized screen.

The writer had every opportunity to observe their cathode-ray tube manufacture, obtained their construction and phosphor screening specifications, drawing of their contemplated projection tube, etc. This information is being given to people interested in these details.

2. Cinema Television - At present, this concern is carrying on research work on cinema projection, i.e. they are not supplying television tubes or sets. It is rumored they have completed a system giving a  $12\frac{1}{2}$  foot diagonal projected picture, and are working on one that will give a 25 foot diagonal picture. The  $12\frac{1}{2}$  foot is rumored to be air-cooled, the 25 foot water-cooled. 45KV are used on both.

3. A. C. Cossor (affiliated with Sylvania) - Although they make cathode-ray tubes for oscillographs for general usage, they make television cathode-ray tubes for their own receivers only. They are making 9" and a few 15" tubes. Their tubes have a "stocking net bag" lacquered to the whole bulb, except the face, as a guard against implosion. They are the only manufacturer in England who use an ion trap (built into the magnetic field). The bulbs are blown with rounded face, and have a long neck for the ion trap. American octal base is used  $E_f = ?$ ,  $E_a = ?$  Prewar, they made a 15" consol receiver which sold for \$200.00.

It is rumored that Cossor's plans on cathode-ray tubes, receiving tubes, etc. is to copy American practice to the extent that their development and design work will be conducted in the States, and that most of their work will be production only.

4. EMI - This concern makes only television cathode-ray tubes, and only for their own use. Their receivers use 10" tubes with a few using 15". The bulbs are of hard glass, the leads of tungsten. Prewar, they used a pentode gun with the #1 and #3 grids tied together. They claimed this gave a better graduation of tones. Do not know their present type of gun. Their tubes are very long, to reduce scanning power.  $E_f$  and  $E_a = ?$  American octal base. The anode voltage in their sets is 4KV on the 10", 5KV on the 15".

5. Mullard (Phillips) - They make 9" and 12" tubes for their own use and for the general market. Although they have announced the 12" tube, they have not supplied any yet. They use the blown bulb with the rounded face, a triode or tetrode gun.  $E_f = 6.3$ ,  $I_f = .6$ ,  $E_a = 8500$  (not aluminized) and American loctal base. They are developing a 12" tube with a 6.3 volt 0.3 amp. heater for series operation.

6. Ferranti - They have only entered the television market recently, and make cathode-ray tubes exclusively for their own use. Have no information on their tubes.



7. G.E. C. - They make cathode-ray tubes for their own equipment, and for others. They make a 9" and 14", but have not sold any 14" (weights 30 lb.). They use pressed glass faces (but rounded). Their tubes have American octal bases, triode gun.  $E_p = ?$ . The rated maximum anode voltage of the 9" is 5000.

8. Standard Telephone and Cable - They purchase their requirements from Edison Swan.

9. Baird Television - They purchase their requirements from Edison Swan. At one time, they made a 28" tube.

Some of the larger television receiver manufacturers are listed below, somewhat in the order of their production. The writer was not able to obtain published information on their products.

1. Pye
2. E. K. Cole
3. Cosser
4. Murphy
5. HMV (His master's voice)
6. Mullard
7. Plessey (manufacture only for CWS - Cooperative Wholesale Society, which is alleged to have a vast market).

Receiver manufacturer's generally consider 400 - 500 receivers per week as the most economical production rate. At present and since the war, their production has not been continuous because of inability to get components as well as cathode-ray tubes. The shortage of regular receiving tubes has been almost as serious as that of cathode-ray tubes.

Although it has nothing to do with television, it should be mentioned that a FM station is being built in Kent. Completion date is some time in 1949.

G. F. Callahan  
5/7/48