

LANCASTER TRIP  
March 29, 1949

I visited Lancaster on March 29th with Messrs. Waugh and Campbell largely for the purpose of discussing cathode-ray tube standardization; in particular, the wide angle deflection tubes. The following points are of interest.

1. They are most anxious to cooperate in every way in agreeing on a proper deflection angle for the 16" tube and their initial thinking is much the same as ours, which indicates an angle somewhere in the order of 70°. It was agreed that this project would be carried out through JETEC but that we should have adequate data available before introducing the subject. Apparently each of us will have considerably more data in three weeks from now and it was hoped to get together again at that time or soon thereafter.
2. They were cognizant of the neutral filter face plate program but were quite luke-warm toward it, partly, I suspect, because aluminum backing is almost a necessary adjunct to this program.
3. The engineers do not seem to be particularly disturbed that we plan to aluminize a new 16" tube, as it was felt this was not an essential point of standardization. Doug Smith, however, was very critical of our whole aluminizing program, stating that if anything, their tests showed that people preferred the non-aluminized tube. He felt that we were taking an unfair advantage in exploiting the aluminized tube, particularly from the advertising standpoint.
4. They claim to have no immediate plans for a 12" tube, but if they do bring one out it will undoubtedly be a metal tube. I gather that they are fearful that they will be forced to do this sooner or later.
5. It appeared that they have had some difficulty in screening the large 16" tubes and want to be sure that the face plate radius on the wide angle tube is increased so that this job at least will not be made more difficult.
6. I inspected the production lines and both the 10" glass and 16" metal appeared to be produced in a very satisfactory manner.
7. I inspected the camera tube manufacture and saw nothing to change our opinion with regard to our entering this field. However, they are more than meeting their production schedules and, in fact, have been able to cut back a little and still meet the demand. I gather this was partly due to the fact that the new bismuth tube will be coming along and they do not want to build up too heavy stocks.

8. I gathered that the fact that components are the full responsibility of the Tube Division is of considerable help to them in coordinating new tube developments with these components. An example is the design of yoke to fit various deflection angles.

9. They were quite opposed, from a manufacturing standpoint, to rectangular tubes and felt that the recent activity on the part of the glass companies was due to a possible advantage they might have in competition with metal. They have tried to side step rectangular designs, but pressure is being brought on them and they felt they might sometime have to go into them. They said, however, that it would present real manufacturing difficulties and increase the cost of the tubes considerably.

O. W. Pike  
March 30, 1949

VC Campbell  
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MAR 30 1949

TUBE ENGINEERING

REPORT ON TRIP TO R.C.A.  
LANCASTER - MARCH 29, 1949

Mr. O. W. Pike, Mr. V. C. Campbell and I made the trip primarily for the purpose of discussing standardization of the wide deflection angle television picture tube. The other subjects of interest which were discussed were covered in Mr. Pike's report of March 30th; therefore, this report will primarily cover the details of the discussion on the wide angle tube.

Those in attendance at the meeting were (RCA) Dr. L. B. Headrick, Dr. Ulrey, D. Y. Smith, Lloyd Swedlund, C. P. Smith, H. P. Steier; (G.E.) V. C. Campbell, O. W. Pike, and G. T. Waugh.

#### Metal Funnel

RCA was concentrating on a  $70^\circ$  deflection angle tube. They have several different metal funnel shapes which they have been considering. Included in these shapes were straight-sided funnels and funnels which had various degrees of bulging of the sides. These funnels have been designed with a 6" opening at the bottom. This is necessary in order to have sufficient glass length for insulation purposes.

Their preliminary work has indicated that the straight-sided funnel is the most economical. In other words, the advantages gained in screening the bulged funnels were not sufficient to warrant the increased cost. They also experienced some warpage in the bulged funnels.

It was their thinking that  $70^\circ$  was a good compromise on deflection angle, and are therefore concentrating their preliminary work on this size. There is perhaps less to be gained in over-all length in going beyond  $70^\circ$ . Too, it is probably uneconomical from the sweep power standpoint to go beyond a deflection angle which would require more than two sweep tubes.

They are attempting to hold the over-all length of the tube to an 18" maximum. It was agreed that G.E. would carry on an investigation of  $60^\circ$  and  $80^\circ$  tubes with RCA obtaining data on a  $70^\circ$  tube. It was hoped that data would be available on the above, so that we could again get together in three or four weeks.

#### Face Plate

The face plate will have a greater radius of curvature. This may be somewhere between 35 and 40". This will depend somewhat upon the curvature required to stay within a  $7/32$ " thickness. This is the maximum thickness available in standard window glass. It is possible that the face plate may have a double radius. This should facilitate the screening process.

### Gun

In view of the shorter over-all length of the tube, it will be necessary to use a narrower beam and more accurately centered gun. In order to do this, RCA may use a cheaper and shorter ion trap gun with single pole magnet. They will consider the use of a triode gun similar to that used in the G.E. 8AP4. They plan to design the tube for 14KV design center anode potential. The tube will probably operate at 12KV.

### Glass Neck & Funnel

RCA is working with the glass companies in making the 6" glass funnel. These will probably be made of low-lead glass. They will investigate higher expansion glass to obtain a better seal to the metal funnel.

### Basing

Standard bases will most likely be used.

### General Comments

Some interest was expressed on stems having straight through leads. However, a stem of this type will not likely be used on the wide-angle tube.

RCA is working on a process for internal blackening of the funnel by chemical means.

We questioned RCA people regarding their interest in standardizing on a melt lot approval test for chrome-iron funnels. Their viewpoint on this was that their Licensee Lab. will submit their present test to the licensees. This will no doubt then be submitted to JETEC for a standardization proposal, along with other manufacturer's proposals.

A report on the stem machine set-up was given to Equipment Development Division people.

A number of other items concerning the manufacturing facilities and techniques were reported on to our Production Engineering Group.

G. T. Waugh  
4/4/49

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