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Division 6 - Lincoln Laboratory
Massachusetts Institute of Technology
Cambridge, Massachusetts

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To: Jay W. Forrester
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SECTION I - CAPE COD SYSTEM

1.1 Group 61

1.10 General

(R.J. Horn, Jr.) (CONFIDENTIAL)

Summary

Equipment for testing the IBM radar-mapping console for XD-1 has been assembled, and delivery of the mapper is expected in the next biweekly period. Work on the new radar-mapping consoles for the Cape Cod System is continuing. In connection with the current mappers, considerable promise is shown by a new mapping method which consists of applying a mixture of "Flo-Master" transparent inks with a "Flo-Master Fountainbrush."

The AFCRC ground-to-air data link is still undergoing extensive testing and evaluation. A C-47 is being used to permit in-flight maintenance.

Mark X data has proved very successful in improving the tracking of interceptors during Direction Center Operations.

The primary emphasis of the Weapons Direction Section has been on evaluating the various operating stations. In addition, considerable time has been spent with visiting ADC personnel.

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1.3 Group 651.31 Activities of Group 65

(P. Youtz) (CONFIDENTIAL)

Groups 25 and 65 and C. L. Corderman of Group 62 are doing considerable work on the electron optics of the Charactron and Typotron tubes to complement the works of Convair and Hughes respectively on these tubes. Two research tubes, Cht 11 and Cht 12, which implement this program, were discussed in the last Biweekly Report. Another research tube used for this program, Cht 13, was constructed during this period. This tube has a sliding target which slides almost 18 inches. This will be used to find the focal points of the Hughes convergence coil for the case of 90° rotation of the image. The convergence-coil designs for Charactron tubes will be evaluated with Cht 16. This tube will be constructed during the next biweekly period.

Another tube scheduled for construction is Cht 14, which is similar to Cht 12 except that it will have an improved selection of electrode parameters based on the tests of Cht 12. The purpose of this tube will be to evaluate methods of reducing registration problems in Charactrons and increasing deflection sensitivity in Typotrons.

In the case of Charactrons the problem in post-acceleration is to get sufficient accelerating voltage without serious loss of deflection sensitivity. Tektronix developed a helical-dag coating which permits a low voltage in the deflection region and a very high voltage at the phosphor screen. They indicated they were not getting reproducible results without a large number of failures. Our program to produce helical coatings indicates that it may be difficult to get reproducible results. However, we will continue our work on these helical coatings. We will also investigate the feasibility of multiple-band tubes. Group 65 will make some tubes for this investigation. Group 25 will compare the trajectories in different types of multiple-band tubes with those of helical-coated tubes. Corning Glass Works is not eager to put multiple anode buttons in glass envelopes for multiple-band tubes. A helical-coated tube would require only one anode button.

C. L. Corderman and I with representatives from IBM and Convair visited Corning Glass Works. There was technical agreement upon details of the envelope for the 19-inch Charactron tube. The envelope is sketched on our drawing SD-57725. This envelope will be a sealed bulb with the front face panel of the 19-inch color-television tube. The funnel will be spun in an enlarged mold made from the 19-inch color-television mold. In order to expedite the program while negotiations between IBM and Convair on the Charactron tube continue, IBM has agreed to buy the molds and tools to make these 19-inch envelopes. The envelopes for the 19-inch Charactron will not be ready before 1 May 1954. Meanwhile developmental work will continue with commercially available 16- and 19-inch glass envelopes.

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SECURITY INFORMATION

1.31 Activities of Group 65 (Continued)

(P. Youtz) (CONFIDENTIAL) (Continued)

Work continued for Group 25 on the sublimation of cadmium sulphide, coating of glass aperture masks, settling of phosphor screens, and study of properties of potassium-chloride films. W. L. Gardner of Group 25 also requested some work on molded thermionic cathodes.

A two-day trip to IBM at Poughkeepsie was made during this period in support of the reliable-receiver tube program as well as the Charactron program.

1.33 Research and Development

(J. S. Palermo) (UNCLASSIFIED)

During this past period several 16-inch tubes were coated with ink helices. One such tube will be prepared and processed in order to obtain further data on this ink. We are continuing the evaluation of several variations of ink for this purpose.

The methods of preparing phosphor screens have been the subject of study during this past week for use on the Charactron.

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