Memorandum M-2795

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

SUBJECT: BIWEEKLY REPORT FOR APRIL 23, 1954

To: Jay W. Forrester

From: Division 6 Staff

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SECTION I - CAPE COD SYSTEM

1.1 Group 61

1.10 General

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

Memos describing the results of the operation of the Identification, Antiaircraft, Height Finding, and Interception Sections of the 1953 Cape Cod System have been written and are being reviewed.

Memos discussing the track-while-scan stations and operations are being written. Those covering Track Monitors, Radar Mappers, Radar Mapping Supervisor, correlation program, and calibration of the Cape Cod System have been written and are being revised.

Detailed analyses of each Cape Cod test are now available in inter-office memo form. A formal memo on results will be issued about every two months.

It has been decided to have a version of the 1954 Cape Cod Weapons Direction program with which automatic target and battery evaluation and other weapon assignment programs may be tested.

A series of meetings of weapons direction and track-while-scan personnel has been begun to discuss problems of mutual interest.

1.3 Group 65

1.31 Activities of Group 65

(P. Youtz) (UNCLASSIFIED)

The week of 12 April was spent at Convair and Hughes Aircraft. F. A. Rodgers, T. F. Clough, and I reviewed the progress of these Corpoations and discussed our own work with them. We carefully evaluated their construction facilities and processing techniques. C. L. Corderman joined us for one day at each plant to discuss the electron optics of the tube and their future plans. In general, Convair's and Hughes' progress is satisfactory. Convair is rather slow in getting their tube-production facilities compatible with their development and production needs.

One day was spent at Sylvania. Saul Twicken took some pulse-test equipment to Emporium, so that Sylvania could produce tube characteristics under pulsed conditions compatible with the IBM-MIT results. At the present moment Sylvania is having cathode trouble with the SR-1782A tube. A vigorous program has been initiated at Sylvania to correct this trouble.

An IBM-MIT group visited Du Mont to discuss and investigate a 16-inch display tube for the video mapper and the photomultiplier tubes to be used with the mapper and in the light gun. This was a successful trip.

The Group put special effort on the helical-dag coatings to be used on the 19-inch Charactron bulb. George Sponsler's work on the electron-trajectory studies indicated that the helical-dag coating should be used. Convair is depending on MIT to develop a production technique for applying the helical-dag. Most of this technique is under control. A few of the first tubes made this period using this technique had faults not attributable to the dag. By the end of this period the tubes were very satisfactory. This program will be given top priority during the next period.

1.33 Research and Development

(J. S. Palermo) (UNCLASSIFIED)

A new series of helical-dag, 16-inch cathode-ray tubes has been assigned to supplement two tubes, CX-68 and CX-69, which were sent to the Test Group as scheduled. A tentative schedule for the daily construction of one 16-inch helical-dag CRT has been planned in order to obtain adequate data for the evaluation of helical dag for post acceleration and to perfect the many techniques involved in the construction of these tubes.

The mechanical tilt table for liquid settling of luminescent screens and the processing of lacquer films onto phosphor screens was received 22 April.

1.33 Research and Development (Continued)

(J. S. Palermo) (UNCLASSIFIED)

Another phase of our program has been the preparation of research tubes for the evaluation of lacquer-film formation for aluminizing. Two aluminized CRT's have been prepared for further processing. Some difficulty has been encountered with the lacquer films because of shrinkage. However, our latest formula has produced lacquer films that have good gloss, are tough, and have high elongation. Evaluation and study of this technique and process will continue together with our helical-dag program.

(P. C. Tandy) (UNCLASSIFIED)

One Charactron and several helical-dag tubes have been tested during the past two weeks.

The symbols of the Charactron remained fairly well defined even at zero bias. A splashing of electrons at zero bias, however, caused the symbols around the desired symbol to be illuminated also. A curve of cathode current vs. grid-cathode voltage and a curve of matrix plus screen current vs. focus voltage at several values of grid-cathode voltage were obtained for this tube.

The first helical-dag tube tested broke down when more than 2kv was applied across the helical coating; this tube was probably gassy. The next tube tested operated with 10.5kv across the helical coating. The cathode of this tube did not give satisfactory emission after a few hours of operation and would not respond to reactivation. Tests on helical-dag tubes will continue.