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Division 6 – Lincoln Laboratory
Massachusetts Institute of Technology
Lexington 73, Massachusetts

SUBJECT: EPSCOM Biweekly Report for 18 May 1956

To: Distribution List

From: R. P. Mayer

Date: June 5, 1956

Approved: _K. E. McVicar_

Abstract: EPSCOM now includes 39 people. A report on most of the
            EPSCOM programs is given.

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One new WE programmer, D. F. O'Neill, has joined EPSCOM. The EPSCOM manpower now stands at 39 people.

Paul Coakley (BTL) will be available essentially full time in the EPSCOM area at Murphy. He will assist programmers in the use of the utility system, including the checker.

The planning subsection has started an inquiry into the present plans for master operational recording tape format and analysis. EPSCOM may need to make use of some of these programs for system integration and test. The planning subsection is assisting Group 62 in setting up a small-scale preliminary maintenance-procedure plan for ESS.

Further details on all of the EPSCOM programs can be found below.

(R. P. Mayer)

Specification and Documentation Subsection

A skeleton form of the SAGE (and ESS) version of the single-track tracking program has been coded. Final compilation is awaiting the completion of key-punching in the Card Preparation Room.

Several people are working on various portions of this program:

Margaret Tefft (BTL) is completing work on a 1024-numbers, single quadrant, $\pm 2^{-15}$ accuracy sine-cosine table routine which is to replace the less accurate routine currently being used in the tracking program. She is also beginning work on a data conversion routine which will be used in the tracking program to convert range, azimuth values of radar returns to x, y values with a conversion accuracy of $\pm 1/64$ mile (15 bits).

Don Dalin (WE) and Joe Flannigan (WE) are developing a routine which will be used in the tracking program for printing out via the line printer all tracking information. This routine will be developed for use of the standard "PRINT-PUNCH EDITOR" plug-board for the line printer. The print-out format will be a considerable improvement over the format of the present tracking program.

Wayne Gramling (WE) has been assigned the responsibilities of check-out engineer for the revised (SAGE and ESS) version of the LRI and GFI sub-system testing tracking program. He will also serve as check-out engineer for the Height-Finding equipment sub-system testing tracking program in conjunction with J. Maroney (WE) and F. Sweeney (RAND).

Several coding specifications (FIRST DRAFT) have been prepared by the Specification and Documentation Subsection of EPSCOM. These are the Coding Specifications of the following Programs:

(1) Data Coordinate Conversion Routine for Height Flight Test Tracking Program Print-out.

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#8508 - "Inverse Stereographic Conversion" x-y to Latitude, Longitude ± 1 mile accuracy.

(2) RI Drum Data B-Scan Display Program #8506

(3) Print and Punch Routine for the LRI and GFI equipment sub-system acceptance test tracking program #8900.

Several other coding specifications have been started. These include specifications for the following programs:

(1) Radar Orientation & Calibration Program #8905.

(2) Quick Radar Status Recapitulation Program #8904.

(3) Single-Track Tracking Programs #8900 & #8700 for SAGE External Equipment Sub-system Acceptance Testing.

(4) LRI Single-Message Test Program #8903.

(5) Site Constants Read-In Routine #8509 for the Tracking Programs #8900 & #8700.

(6) Computation of Site Constants (Routine #8503).

(C. S. Sherrerd)

A memo assembling material on the differences between the XD-1 and AN/FSQ-7 computers is near completion. This memo will contain the major differences in the operational instructions of the two computers and also references to other memos and prints for more detailed descriptions.

As soon as this memo has been completed, work on the Quick Radar Check Program will resume.

(Helen E. Quirk)

Pattern Checking Program

Considerable progress has been made on the LRI-GFI Pattern Check program. The program was assembled with extensive modification written by Marcia Tobin, Glen Paulsen and myself. These modifications have been debugged and the program will be used by the LRI test team.

The next assembly of the program will include modification to "LR" routine which will provide:

a. A check for consecutiveness of pattern returns between program cycles.

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b. A check for duplication of pattern returns within two pro-
gram cycles.

c. A print-out of number of tape records written, so far

d. A print-out whenever the number of words read from a "LR"
drum field is odd, if present program shows that this con-
dition exists.

e. Storage of LR site data obtained this program cycle that
will be needed next time this "LR" site's returns are
examined.

The above modification will be written by Miss Tobin.

(W. J. Marston)

The "missing word" and "matching extra" routines and various
minor modifications in other routines have been inserted in the "pattern
check" program and been debugged.

(M. J. Tobin)

Orientation Program

Work on the "Orientation" program is progressing. The method
of approaching the basic problem involved detecting errors which may ex-
ist in the location, orientation and/or calibration of each radar site
has been more thoroughly clarified. The fundamental steps now involved
in this data analysis program include:

(1) Read-In and interpretation of punched cards from
Tracking Program.

(2) Sorting of above data according to Site Number.

(3) (a) Computations on above data and display of results
to be photographed by S.D. Camera.

(b) Statistical analysis on above data with a printout
of results.

Step 3 (a) or (b) or both will be at the discretion of the
operator and will be repeated for each site.

At this date, a flow diagram has been written for the Card
Read-In section and the coding of same has been initiated. A general
coding specification memo is being prepared by Chris Sherrerd to serve
as a guidance for this program.

(M. Dolan)

Mathematical and Other Routines

We are modifying the routines for dual precision arithmetic to

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include negative numbers. We have also written a routine for conversion of decimal angles into azimuths. The latter routine involves dual precision so we cannot run it until the former is checked out.

> (Paula Titiev and
> Elaine Colleran)

A sub-routine for the Height Flight Test program to convert the x and y coordinates to latitude and longitude is being compiled. A pattern card conversion program is in the final stages of check-out.

> (C. Toohig and
> B. Awad)

Geography Display

The geography display program is finished and working. The sections of the Situation Display Translation Program pertaining to Information and Tabular messages has been coded and sent to the card preparation room.

> (Ann B. Tebbetts)

Crosstell Program

We are continuing to run full-scale tests with Whirlwind I.

The latest test (May 17) was only partially successful; there are two reasons.

First of all, there was equipment trouble which probably relates to the telephone lines. A number of messages were either garbled or completely lost on their return trip to the Barta Building. The outgoing transmission of data from Whirlwind I to XD-1 seemed to be almost free of trouble.

The second problem we had is due to a programming error that came about as the result of a minor modification of the coding. When Whirlwind I sent out the first eight messages with the second word of each message complemented (i.e. there were eight intentional errors), XD-1 did not send anything back to Whirlwind I, nor did it execute the printout.

Whirlwind I sends out intentional errors during each run to check the error-detection features of the XD-1 program. As of two weeks ago, the XD-1 program was apparently satisfactory in its handling of erroneous data; however, as mentioned above, a minor change was since made in the coding, and this change introduced a flaw. The exact nature of the trouble is now known, and it will be immediately corrected.

At the present time, the writer is re-doing the crosstell coding in compiler language. The new version has been greatly simplified, and will be far easier to document than the program which is now in use.

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Coding of the new program is almost half completed.

A post-mortem on the May 17 run will be held at Barta on Monday, May 20.

(L. J. Rose)

RPM/br

Signed: *R. P. Mayer*
R. P. Mayer

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