SUBJECT: PROGRESS REPORT FOR AN/FSQ-7 - May 20, 1954

To: J. W. Forrester, R. R. Everett, Division 6 Group Leaders
From: P. J. Gray
Date: May 20, 1954

Abstract: A recent meeting at ADC Headquarters covered several phases of Transition System planning. The situation display selection frame has been eliminated. Miscellaneous Radar Inputs (Fine Grain Data, Automatic Height Finding and Mark X) will be included in XD-1.

1. Transition System Planning

At a recent meeting at ADC Headquarters several items regarding the Transition System were discussed by Lincoln, ADES and Air Force personnel. Briefly, the material covered was the following:

a. For normal operation the AN/FSQ-7 will have a capability of accepting data simultaneously from six heavy radars and seven gap fillers. This assumes data transmission from each heavy radar will be with the Fine Grain Data System. This ratio of heavy to gap filler radars may be modified on the basis of five gap fillers being equivalent to one heavy.

b. The latest thinking regarding the mode of operation of the two computers in the Duplex Central was outlined at the meeting. Also, discussion was held regarding the probable time (about 5 seconds) to switch over by the computer and a review of latest estimates on equipment reliability based on data gathered from performance of WWI.

c. The ability of the AN/FSQ-7 to control weapons was discussed. Data from simulation experiments and WWI experiments was reviewed and the ability of the FOD system to provide sufficient accuracy was outlined.

d. The communication transmission (telephone) requirements were discussed and the phone company advised that they saw no problem in supplying sufficient lines of the required performance level to meet the planned Transition System program. The telephone lines to be used for data transmission will be slightly higher in quality than standard voice lines.
The design and layout of equipment in the building for the Duplex Central was reviewed.

2. Display

Visits to Convair and Hughes indicate both companies are preparing production facilities and continuing engineering development for the tubes to be used in the FSQ-7. A Charactron is now connected into MTC with provisions for digital expansion. The addition of an RF pulse in connection with Typotron operation has resulted in improved contrast.

Review of the logic for display selection has resulted in a decision to eliminate the central display selection frame and to include the necessary hardware in each console. This change results in simplified logic, cabling and savings of tubes and diodes. Specifications for the display system will be re-issued to reflect this and other minor changes which have been agreed upon.

Study of the question of testing consoles in connection with routine maintenance has led to the decision that this should be done by inserting suitable programs into the computer at times when the normal operating load is low. All of the consoles will be connected so that they will receive display information from the same computer and will be switched as an entire group from one computer to another.

The experimental IBM designed light gun has been installed and tested on the Cape Cod System and after some adjustment was found to work satisfactorily. The system for projecting a red spot on the face of the tube works quite well and appears helpful to the operator.

3. Prime Power

Recent discussions of sources of prime power and the problem of power interruption indicate that there are several alternatives which should be carefully evaluated. Batteries are not suitable to back up the DC supplies due to voltage variation of about 8% depending on the state of the battery charge. The possibilities which appear to be open are:

a. Use of three part motor generator sets consisting of an AC motor, DC motor and an AC generator. Under normal operation the AC motor would drive the generator, receiving its power from the utility transformers. In the event of utility failure the DC motor would drive the generator, receiving power from standby batteries. This would carry the central until diesel standbys could be put into operation.

b. Providing no special back up power other than diesel standby and relying on the ability to start the diesels and switch them on to the line rapidly enough to allow resumption of operation of the central without serious loss of data.
c. Steam generation of all power at the central location.

Further study of the problem is under way.

4. Memory

Six new type sense amplifiers are being constructed for incorporation in MTC. After evaluation, a full complement will be installed in MTC. This activity ultimately is expected to lead to a recommendation to include this model in AN/FSQ-7.

5. Drums

Decision has been made to use diode switching for the read-write circuits associated with the drums. This will be used for XD-1 and 2 and the initial Duplex Centrals. Investigation of magnetic switching is continuing however with the view to possible application later in the production program.

6. Miscellaneous Radar Inputs

It has been decided to incorporate provision for miscellaneous radar inputs (Fine Grain Data, Automatic Height Finding and Mark X) in the XD-1 system. Amendment 3 to Exhibit AFCRC-1 is being prepared to cover this.

Signed: [Signature]

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Approved: [Signature]

A. P. Kromer

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