

Memorandum 6M-3291, Supplement 2

page 1 of 5

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

SUBJECT: SPECIFICATIONS FOR THE CENTRAL COMPUTER SYSTEM FOR THE AN/FSQ-7,
SUPPLEMENT 2

To: S. H. Dodd

From: R. R. Shorey and J. J. Carson

Date: 15 May 1955

Approved:

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Abstract: The AN/FSQ-7 specifications for the Central Computer System, as recommended by Lincoln Laboratory, were listed in 6M-3291 (released by TIR #1-57) and supplement 1 (released by TIR #1-66). This supplement (supplement 2) lists status changes and modifications in the following areas:

- a) Reduction in the number of spare memory plane frames;
- b) Concurrence on parity count and check controls;
- c) Addition of two index registers to the program element;
- d) Changes in the selection and input-output control;
- e) Revision of magnetic tape element specifications;
- f) Specification of a core memory assignment switch;
- g) Revision of PERSELBSN Codes.

1.0 Introduction

The specifications for the Central Computer System of AN/FSQ-7 are defined by Lincoln Laboratory Memorandum 6M-3291, Specifications for the Central Computer System of AN/FSQ-7, (released by TIR 1-57) and supplement 1 (released by TIR 1-66). Modifications to and changes in the status of specifications since the release of 6M-3291 and supplement 1 are listed, but not described in detail, in this supplement. In addition, Lincoln Laboratory recommendations on the importance of certain modifications are included. "Concurrence", as used below, means that Lincoln and IBM have agreed on the adequacy of the technical design specified in a particular document.

2.0 Specifications

2.1 Memory Element

A concurrence letter dated 10 February 1955 indicates Lincoln-IBM concurrence on IBM document, Spare Plane Frames of the AN/FSQ-7 Production System Memory Element D-114-1, dated 7 February 1955. The number of spare plane frames is thereby reduced from three to one. This change is incorporated to reduce the manufacturing effort since experience had indicated that more than one spare plane does not significantly facilitate maintenance. Lincoln recommends that this change should be incorporated at the manufacturer's convenience in such a manner as not to adversely affect presently scheduled work. The core memory assignment switch as described in 2.6 below should be mentioned in the memory specifications. (Ref: subsection 1.1 of 6M-3291).

2.2 Arithmetic Element

IBM document D-6-2 Parity Count and Parity Check Controls, dated 18 March 1955 describes the functions of the parity count and check circuits in such a manner that some equipment changes are required. Lincoln-IBM concurrence is indicated in a letter dated 18 March 1955. (Ref: subsection 2.1 of 6M-3291). This document is the equivalent of XD-1 Parity Count and Parity Check Controls D-22, by Kurkjian and Macdonald, dated 21 September 1954 and replaces it for the production machine. It states that the parity circuits are fail safe. As previously stated in section 2.3 of 6M-3291, if not incorporated initially, these changes should be made in all machines as soon as present delivery schedules permit. (Ref: subsection 2.3 and 2.5 of 6M-3291).

2.3 Program Element

IBM document D-5-1, Revision to the Program Element Production System, dated 14 February 1955 provides for the addition of two index registers to the program element. This increases the total number to four as recommended in subsection 3.1 of 6M-3291. Lincoln-IBM concurrence is indicated in a letter dated 15 February 1955. As indicated in section 3.1 of 6M-3291, verbal agreement has existed to the effect that four index registers will be provided. These registers are necessary for the performance of **air defense work**.

The core memory assignment switch described in 2.6 below requires the addition of a relay to the program element.

2.4 Selection and Input-Output Control Element

IBM document D-19-2, Selection and Input-Output Control Specifications for the Production System, dated 11 March 1955 provides for the deletion of an alarm pulse to control a flip-flop in each computer in the event of power failure. Lincoln-IBM concurrence is indicated in a letter dated 18 March 1955. Lincoln recommends that this change should be incorporated at the manufacturer's convenience in such a

manner as not to adversely affect presently scheduled work.

Lincoln Laboratory Memorandum 6M-2877, Supplement 6, Specifications for Automatic Camera and Control for AN/FSQ-7 (IBM No. D-82) dated 12 April 1955 received concurrence with modifications in a letter dated 29 April 1955. The camera control system will require connections to be made to the selection control frame. (Ref: subsection 5.1a of 6M-3291).

Lincoln-IBM concurrence on IBM document D-19-3, Selection Control, dated 30 March 1955 is indicated in letter of the same date. This document describes the operate unit, PER (75)₈, lock address counter function, and requires some change in the equipment of the selection and input-output control element. (Ref: subsection 5.1a of 6M-3291).

2.5 Magnetic Tape Units

IBM document, Specifications for the Magnetic Tape Element Production System, D-4-2, dated 8 February 1955 received Lincoln-IBM concurrence in a letter dated 10 February 1955. Magnetic Tape Proposal for AN/FSQ-7 Production System D-4, dated 2 July 1954 which had been previously concurred on is superseded. D-4-1, a proposal for a change in the method of switching tape select lines is incorporated in D-4-2. (Ref: subsection 7.1 of 6M-3291).

IBM document D-4-3, Revision of Specifications for the Magnetic Tape Element, dated 11 March 1955 proposes specification revisions to allow for greater latitude in design. Lincoln-IBM concurrence is indicated in a letter dated 18 March 1955.

2.6 Core Memory Assignment Switch

IBM document D-70, dated 16 February 1955 is a proposal for the addition of a core memory assignment switch. To facilitate this, a present spare toggle switch position at the Duplex Maintenance Console is to be used. This switch will make Core Memory Array #1 act as Core Memory Array #2 and simultaneously reassign array #2 to be referred to as Core Memory #1. Wiring changes at the program element will be necessary to incorporate this change. Lincoln-IBM concurrence on this addition to the production specifications is indicated in a letter dated 18 March 1955. (Ref: 6M-3300, Supplement 1, Maintenance System, AN/FSQ-7). Lincoln recommends that this change should be incorporated at the manufacturer's convenience in such a manner as not to adversely affect presently scheduled work.

2.7 Instruction Control Element

The addition of two index registers to the program element (see 1.3 above) requires modification of the instruction control element. The specifications for this element should be so revised. (Ref: subsection 4.1 of 6M-3291).

2.8 Instruction Codes

IBM document, PERSELBSN Codes, D-16-4, dated 15 March 1955 received concurrence with two corrections in a letter dated 6 April 1955. This document is a compilation of revisions to PM-8-5, Programmer's Reference Manual D-16, and supersedes all previous revisions listed under D-16 and D-16-1. (Ref: subsection 8.1 of 6M-3291).

3.0 Referenced Documents

The following documents should be added to the list of detailed specifications for the central computer system for the production machine:

<u>IBM DOCUMENTS</u>		
<u>IBM File No.</u>	<u>Document</u>	<u>Lincoln Laboratory Div. 6 Doc. Rm. No.</u>
D-14-1	<u>Spare Plane Frames of the AN/FSQ-7 Production System Memory Element, 7 February 1955</u>	6DR-149
D-14-1	<u>Concurrence letter, Spare Plane Frames of the AN/FSQ-7 Production System Memory Element, 10 February 1955</u>	6DR-150
D-6-2	<u>Concurrence letter, Parity Count and Parity Check Controls, 18 March 1955</u>	6DR-176
D-6-2 (replaces D-22 D-1 Parity Count and Parity Check Controls)	<u>Parity Count and Parity Check Controls, 18 March 1955</u>	6DR-177
D-5-1	<u>Revision to the Program Element Production System, 14 February 1955</u>	6DR-242
D-5-1	<u>Concurrence letter, Index Registers Program Element, 15 February 1955</u>	6DR-170
D-19-2	<u>Selection and Input-Output Control Specifications for the Production System, 11 March 1955</u>	6DR-245
D-19-2	<u>Concurrence letter, Selection and Input Output Specifications for the Production System, 18 March 1955</u>	6DR-175
D-19-3	<u>Selection Control, 30 March 1955</u>	6DR-206
D-19-3	<u>Concurrence letter, Selection Control, 8 April 1955</u>	6DR-241

Memorandum 6M-3291, Supplement 2

page 5
Lincoln Laboratory
Div. 6 Doc.Rm. No.

<u>IBM File No.</u>	<u>Document</u>	
D-82	<u>Lincoln Laboratory Memorandum 6M-2877, Supplement 6, Specifications for Automatic Camera and Control for AN/FSQ-7, 12 April 1955</u>	
D-82	<u>Concurrence on Automatic Camera and Control for AN/FSQ-7, 29 April 1955</u>	
D-4-2 (supersedes D-4 and D-4-1)	<u>Specifications for the Magnetic Tape Element, Production System, 8 February 1955</u>	6DR-165
D-4-2	<u>Concurrence on Specifications for the Magnetic Tape Element, 10 February 1955</u>	6DR-155
D-4-3	<u>Revision of Specification for the Magnetic Tape Element, 11 March 1955</u>	6DR-247
D-4-3	<u>Concurrence letter, Revision of Specification for the Magnetic Tape Element, 18 March 1955</u>	6DR-169
D-70	<u>Core Memory Assignment Switch, 16 February 1955</u>	6DR-255
D-70	<u>Concurrence letter, Core Memory Assignment Switch, 18 March 1955</u>	6DR-173
D-16-4 (supersedes D-16 and D-16-1 revisions)	<u>IBM document, PERSELBSN Codes, 15 March 1955</u>	6DR-219
D-16-4	<u>Concurrence letter, 6 April 1955</u>	6DR-223

SIGNED:


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Production Coordination Office