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FILE NO.

SUBJECT National Mid-Range COMSEC Program

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DATE 12 April 1954

COMMENT NO. 1

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F. E. HERRELKO
Colonel, USAF
Deputy Director,
Communications Security

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a/s

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NATIONAL
MID - RANGE
COMSEC PROGRAM

1954

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NATIONAL
MID - RANGE
COMSEC PROGRAM

MARCH 1954

NATIONAL SECURITY AGENCY

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9 March 1954

MEMORANDUM FOR: THE SECRETARY OF STATE
THE SECRETARY OF DEFENSE
THE SECRETARY OF THE TREASURY
THE DIRECTOR, FEDERAL BUREAU OF INVESTIGATION
THE SECRETARY OF THE ARMY
THE SECRETARY OF THE NAVY
THE SECRETARY OF THE AIR FORCE
THE DIRECTOR OF CENTRAL INTELLIGENCE
THE ATOMIC ENERGY COMMISSION

SUBJECT: The National Mid-Range COMSEC Program

The Director, National Security Agency, has the responsibility for formulating, for consideration by the Board, integrated programs for the research, development, production, and procurement necessary to meet the requirements of the departments and agencies for crypto-equipments and materials.

In accordance with this responsibility, the program contained herein has been compiled. For practical reasons, this initial statement is the current NSA program and may not reflect all of the special requirements of the civil agencies. Future statements of the program will be more comprehensive.

Comments and suggestions on the program content and presentation will be welcomed.

RALPH J. CANINE
Lieutenant General, US Army
Director, National Security Agency

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INTRODUCTION

1. This program, prepared by NSA, shows the principal requirements of the government for communication security materials and the NSA production available to meet them, and outlines the equipments available or under development to fulfill new needs. The program consists of three parts as follows:

I. Current Equipments and Mid-Range Development (1954-1959)

II. Current Cryptomaterial Production (1954-1956)

III. Long Range Research (1954-1964)

2. The portion presented here consists of Parts I and II. Part III is in preparation and will be submitted when completed.

3. The program is based upon an assumption that peacetime conditions will prevail, that the government will continue its present high level of international activity, support of international forces, and assistance to those countries opposed to communism, and that no significant change will be required in operations to absorb the initial impact of war.

4. The objectives of the program are:

a. To assure the production of the cryptomaterial required:

(1) By all departments and agencies for operating their communication security programs.

(2) To meet the U. S. share of international communication security requirements (NATO, U. K., etc.).

b. To build a reserve of both produced material and production capacity sufficient to meet the impact of full mobilization.

c. To develop or initiate the development of a minimum of one communication security equipment for each of the important methods of communication.

PART I – CURRENT EQUIPMENTS AND MID-RANGE DEVELOPMENT

1. Communication security equipments are, of course, basic to NSA's program for providing overall support to the national communication security effort. The types of equipment currently in use and the extent of that usage determine directly the type and volume of keying material which must be produced. Similarly, the types of equipment currently under development determine the trend which that production will take in the future.

2. The current equipment and mid-range development program is shown in the following Chart I. It covers the principal equipments now in use and under development. It has been limited to equipments conceivably of use to both Civil and military Federal agencies. The chart is organized on the basis of the major communication fields in which security is needed and shows the equipment available or under development to fill the need; the principal types of using agencies; the echelons of usage, and its status during the 5-year period.

3. The detail of a typical program, and one of the principal current ones, for getting new equipment into use is shown in Chart II. This shows the planned rates for the production and distribution of new literal electro-mechanical crypto-equipment for all echelons (AFSAM 7 and AFSAM 47B) and the rotors used in them. Similar detailed charts will be added to the program as equipments progress from development to production.

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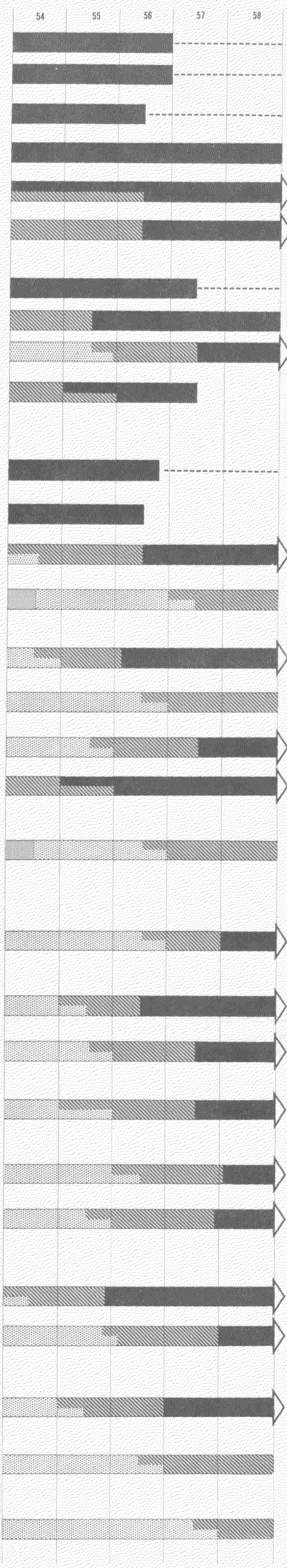
CHART 1

EQUIPMENT	USERS	USAGE LEVEL	STATUS
I. LITHAL (26-CHARACTER), OFF-LINE			
A. ELECTRO-MECHANICAL, KEYBOARD-OPERATED, TAPE PRINTING			
1. AFSAM 25 B, C (FIVE 26-PT ROTOR MAZE, 97 LBS) FAIR LONG-TERM SECURITY	MIL (INTRA, JOINT, COMBINED, NATO)	MED, HIGH	
2. CSP 2900 (FIVE, OR TEN 26-PT ROTOR MAZE, 97 LBS) FAIR TO HIGH LONG-TERM SECURITY DEPENDING ON MODE OF OPERATION	MIL (INTRA, JOINT)	MED, HIGH	
3. CSP 889 (FIVE OR TEN 26-PT ROTOR MAZE, 97 LBS) FAIR TO HIGH LONG-TERM SECURITY DEPENDING ON MODE OF OPERATION	FED & MIL (INTRA, JOINT, COMBINED)	MED, HIGH	
4. MEC-1 (FIVE OR TEN 26-PT ROTOR MAZE, 97 LBS) FAIR TO HIGH LONG-TERM SECURITY DEPENDING ON MODE OF OPERATION	FEDERAL	MED, HIGH	
5. AFSAM 7 (EIGHT 36-PT ROTOR MAZE, 20 LBS) HIGH SHORT-TERM TO HIGH LONG-TERM SECURITY DEPENDING ON MODE OF OPERATION	FED & MIL (INTRA, JOINT, COMBINED, NATO)	LOW, MED, HIGH*	
6. AFSAM 47B (EIGHT 36-PT ROTOR MAZE, 45 LBS) HIGH SHORT-TERM TO HIGH LONG-TERM SECURITY DEPENDING ON MODE OF OPERATION	FED & MIL (INTRA, JOINT, COMBINED, NATO)	LOW, MED, HIGH*	
B. MECHANICAL, TAPE PRINTING			
7. M-209/CSP 1500 (6 ROTORS, HAGELIN TYPE, 9 LBS) FAIR SHORT-TERM SECURITY	FED & MIL (INTRA, JOINT)	LOW	
8. AFSAM 36 (12 ROTORS, HAGELIN-TYPE, 18 LBS) FAIR SHORT-TERM SECURITY	FED & MIL (INTRA, JOINT)	LOW	
9. AFSAM 17 (ELEVEN 26-PT PNEUMATIC ROTOR MAZE, 18 LBS) HIGH SHORT-TERM TO HIGH LONG-TERM SECURITY DEPENDING ON MODE OF OPERATION	FED & MIL (INTRA, JOINT, COMBINED, NATO)	LOW, MED*	
10. AFSAM 21 (M-209/CSP 1500 MODIFIED FOR ONE-TIME TAPE, 9 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT)	LOW, MED, HIGH	
II. TELETYPE (32-CHARACTER), ON/OFF-LINE			
A. NON-SYNCHRONOUS FOR NETWORK OPERATION			
11. ASAM 2-1 (FIVE 26-PT ROTOR MAZE, 74 LBS) FAIR LONG-TERM SECURITY (ASAM-2-1 IS CURRENTLY BEING MODIFIED TO PROVIDE HIGH LONG-TERM SECURITY)	FED & MIL (INTRA, JOINT, COMBINED, NATO)	MED, HIGH	
12. AFSAM 4A (MODIFIED SIGNIN) (EIGHT 26-PT ROTOR MAZE, SELF-CONTAINED KEYBOARD AND TAPE PRINTER, 252 LBS) HIGH LONG-TERM SECURITY	MIL (INTRA)	MED, HIGH	
13. AFSAM 9 (NINE 36-PT ROTOR MAZE OR ONE-TIME TAPE UNIT, 46 LBS) HIGH SHORT-TERM OR LONG-TERM SECURITY DEPENDING ON MODE OF OPERATION	FED & MIL (INTRA, JOINT, COMBINED, NATO)	LOW, MED, HIGH*	
14. AFSAM 30 (ELEVEN 36-PT ROTOR MAZE, SELF-CONTAINED KEYBOARD AND PAGE PRINTER, 250 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT)	MED, HIGH	
B. SYNCHRONOUS, FOR POINT-TO-POINT OPERATION			
15. AFSAZ 7315 (SINGLE CHANNEL, TAPE INPUT ONLY, USES AFSAM 9 WITH ROTOR MAZE OR TAPE UNIT, 210 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT, COMBINED)	MED, HIGH	
16. AFSAM 26 (ELECTRONIC CRYPTO-UNIT, SINGLE CHANNEL, ACCEPTS INPUT FROM REMOTE TELEPRINTER, 250 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT)	HIGH	
17. AFSAM 22 (ELECTRONIC CRYPTO-UNIT, MULTI-CHANNEL FOR USE WITH AN/FGC-5, 500 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT, COMBINED)	HIGH	
18. AFSAX 500 (ELECTRONIC CRYPTO-UNIT, MULTI-CHANNEL FOR USE WITH AN/FGC-5 AND SINGLE SIDE-BAND EQUIPMENT, 2500 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA)	MED, HIGH	
C. SYNCHRONOUS, FOR FOX BROADCAST OPERATIONS			
19. AFSAM 37 (ELECTRONIC CRYPTO-UNIT, RECEIVE TERMINALS PROVIDED WITH SEMI-AUTOMATIC MEANS FOR INDEPENDENTLY SYNCHRONIZING WITH TRANSMITTER, 250 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT, COMBINED)	LOW, MED, HIGH	
III. SPEECH			
A. NARROW BAND, FIXED PLANT			
20. AFSAY 809 (SINGLE CHANNEL, PUSH-TO-TALK SYSTEM FOR USE OVER COMMERCIAL WIRELINES, 300 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT)	MED, HIGH	
B. WIDE BAND, FIXED PLANT			
21. AFSAY 801 (SINGLE CHANNEL, PUSH-TO-TALK SYSTEM FOR USE OVER SHORT WIRELINES, OR SPECIAL RADIO CIRCUITS, 300 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT)	MED, HIGH	
22. AFSAY 807 (MULTI-CHANNEL, FULL DUPLEX SYSTEM FOR USE OVER MICROWAVE RADIO LINKS, 1700 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT)	HIGH	
C. NARROW BAND, MOBILE			
23. AFSAY 806 (SINGLE CHANNEL, FULL DUPLEX SYSTEM FOR USE OVER LAND LINES OR HF RADIO, 2300 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT)	MED, HIGH	
D. WIDE BAND, MOBILE			
24. AFSAY 804(X-2) (SINGLE CHANNEL, PUSH-TO-TALK SYSTEM FOR VEHICULAR USE OVER TACTICAL VHF RADIO, 35 LBS) HIGH SHORT-TERM SECURITY	FED & MIL (INTRA, JOINT, COMBINED)	LOW, MED	
25. AFSAY 808 (SINGLE CHANNEL, PUSH-TO-TALK SYSTEM FOR AIRBORNE USE OVER VHF/UHF RADIO, 52 LBS) HIGH SHORT-TERM SECURITY	FED & MIL (INTRA, JOINT, COMBINED)	LOW	
IV. FACSIMILE			
A. FIXED PLANT, POINT-TO-POINT OPERATION			
26. AFSAX 500/AFSAJ 700 (SINGLE CHANNEL SYSTEM FOR USE OVER LONG WIRE LINES AND HF RADIO, 2500 LBS) HIGH LONG-TERM SECURITY	FED & US MIL (INTRA)	MED, HIGH	
27. AFSAX 503 (SINGLE CHANNEL SYSTEM FOR USE OVER SHORT WIRE LINES AND VHF RADIO, AND WITH ANCILLARY EQUIPMENT OVER LONG WIRE LINES AND HF RADIO, 475 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT, COMBINED)	HIGH	
B. FIXED PLANT, FOX BROADCAST OPERATION			
28. AFSAX 505 (FOR USE OVER LONG WIRE LINES AND HF RADIO, 300 LBS) HIGH LONG-TERM SECURITY	FED & MIL (INTRA, JOINT, COMBINED)	LOW, MED, HIGH	
V. AIRCRAFT IDENTIFICATION			
29. REQUIREMENTS NOT YET FIRM. PRELIMINARY MODEL DEVELOPMENT UNDERWAY ON A HIGH SECURITY, COMPLETELY AUTOMATIC SYSTEM FOR USE WITH MARK X IFF. BASIC RESEARCH CONTINUING ON MORE SOPHISTICATED SYSTEM.	MIL (INTRA, JOINT, COMBINED)	LOW	
VI. GUIDED WEAPONS CONTROL			
30. REQUIREMENTS NOT YET SPECIFIED. IF SECURITY IS NEEDED, WILL BE PROVIDED AS INTEGRATED PART OF COMMUNICATION CONTROL EQUIPMENT.	MIL	LOW	



* USAGE LEVEL DEPENDS ON MODE OF OPERATION.

RESEARCH DEVELOPMENT PRODUCTION USAGE REDUCED USAGE

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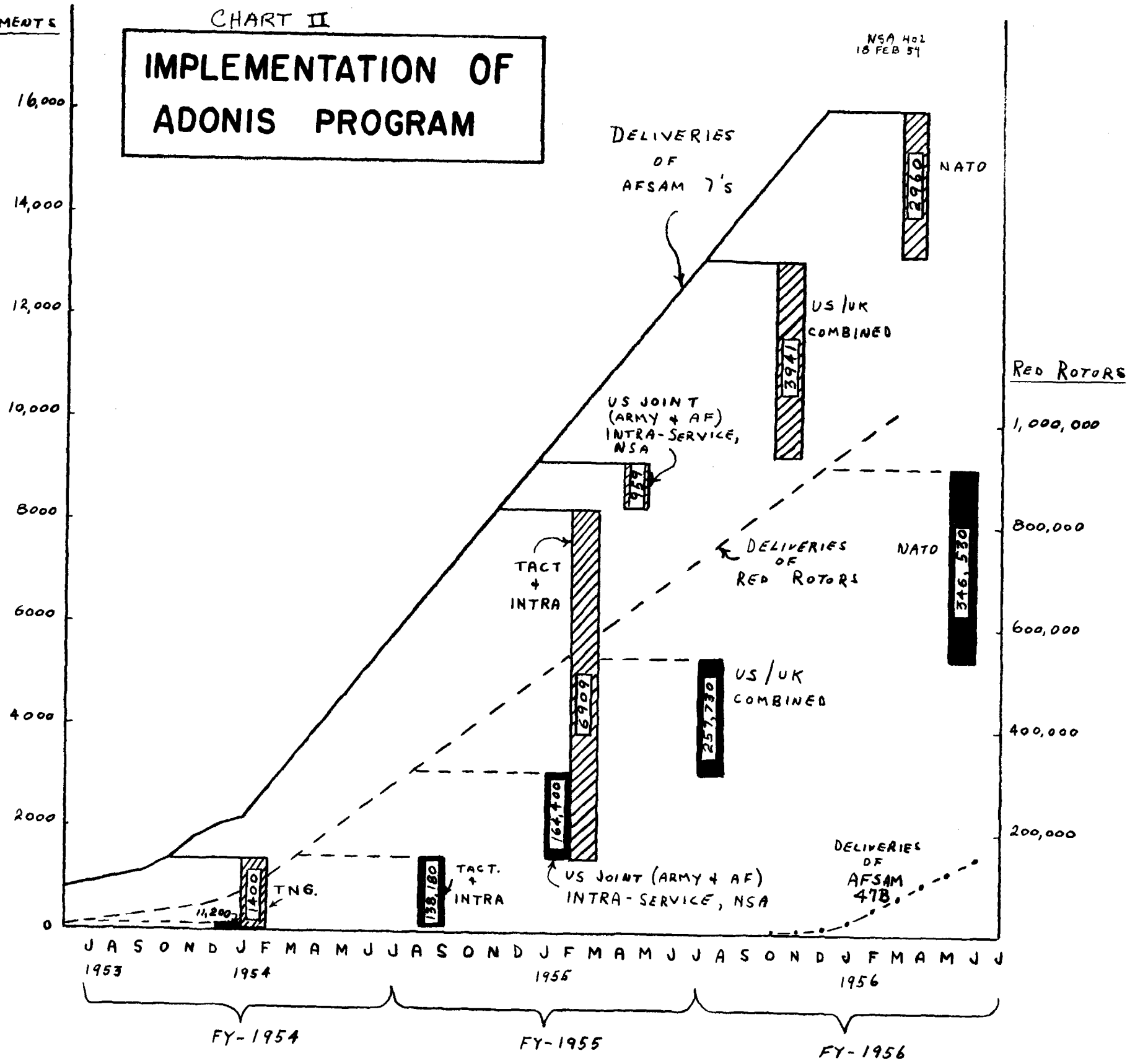
CHART II

IMPLEMENTATION OF ADONIS PROGRAM



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PART II – CURRENT CRYPTOMATERIAL PRODUCTION

1. PRODUCTION - The production of cryptomaterial to support the government's communication security activities constitutes a major segment of this program. The types of cryptomaterial which constitute the bulk of the production activity are one-time tapes (Chart III), one-time pads (Chart IV), rotors (Chart V), key lists (Chart VI), codes (Chart VII), and instructional documents (Chart VIII). The total requirements of the government for the principal types of material and the NSA production planned to meet them are shown in the following charts.

2. Summarized, the situation is:

a. All operating requirements are met from production capacity currently existing in the various government agencies (NSA, State, FBI, CIA, and AEC).

b. Mobilization reserve requirements are being produced by NSA and will be maintained during the 5-year period to meet varying requirements. Increases in production capacity are planned mainly by improvements in methods and production equipment.

3. These charts cover only the NSA production capacity. However, a detailed survey of production capacity and techniques of other agencies which are producing cryptomaterial will be made in the near future and a system for effectively utilizing any capacity which is in excess of an agency's internal requirements will be established.

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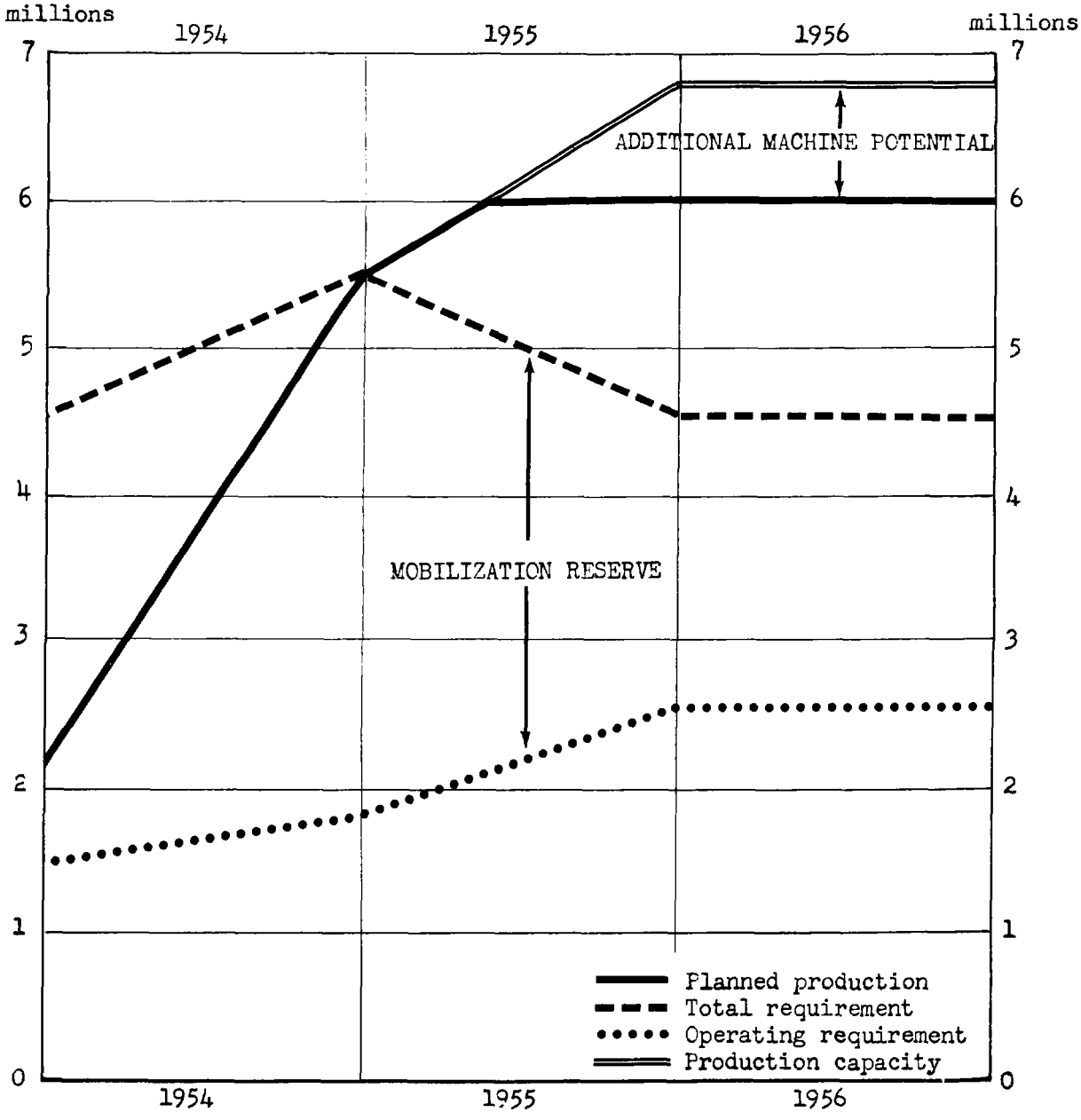
ESTIMATED TOTAL REQUIREMENTS AND PLANNED NSA PRODUCTION
OF ONE-TIME TAPES (3")

CHART III A



Note: The operating requirement includes 25,000 rolls per year needed by the State Department. Since the State Department produces their own tape, the planned production line does not reflect this production.

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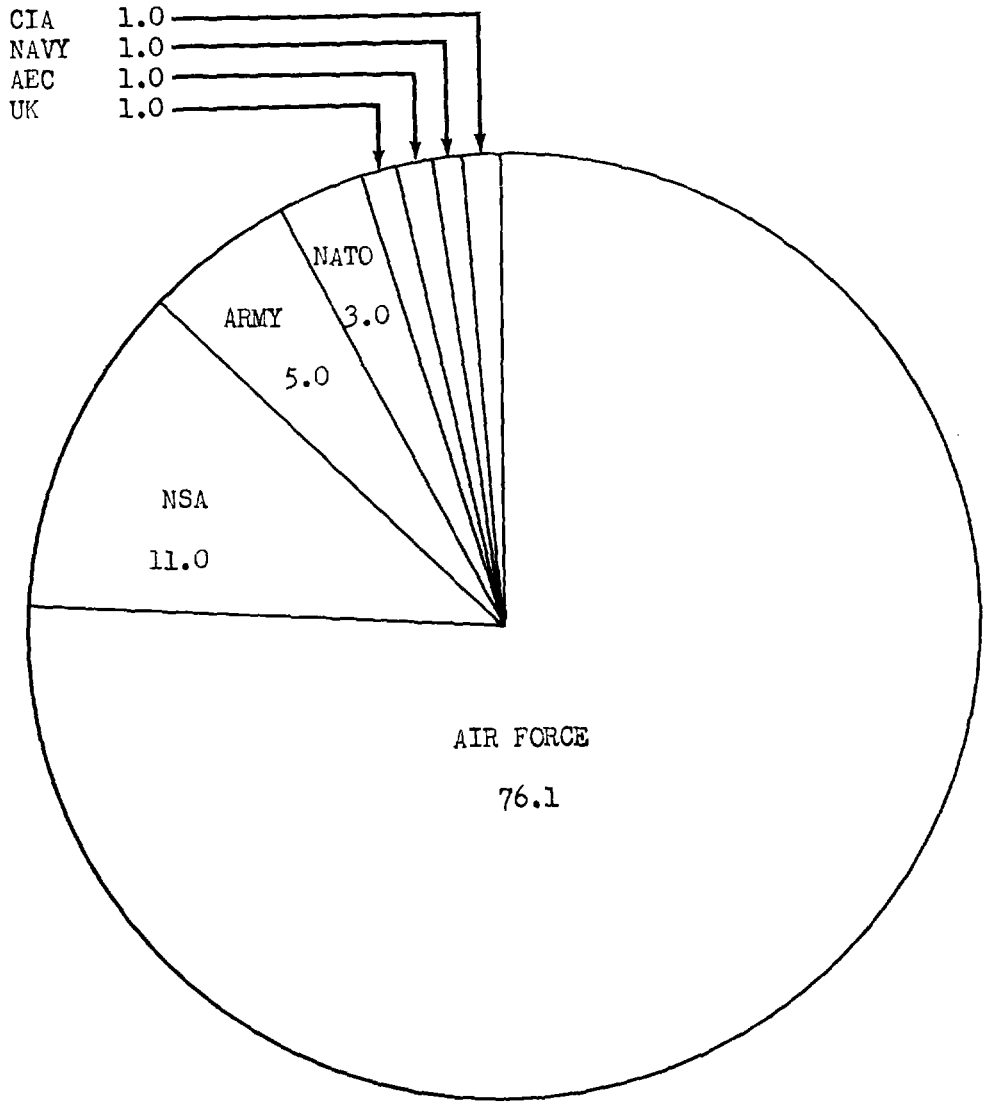
PERCENTAGE DISTRIBUTION OF 1954 NSA PRODUCTION
OF ONE-TIME TAPES (3")

CHART III B



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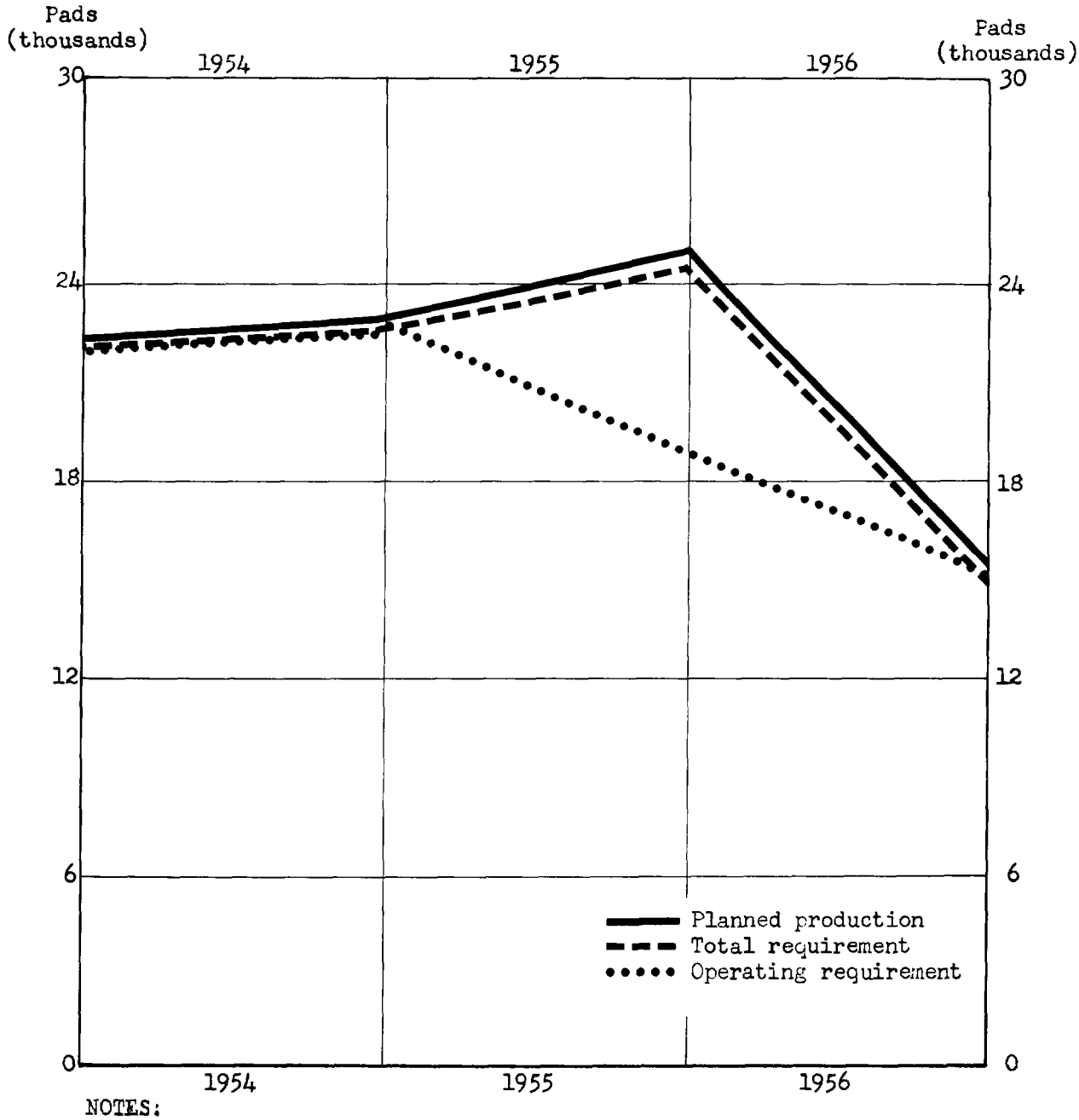
ESTIMATED TOTAL REQUIREMENTS AND PLANNED NSA PRODUCTION
OF ONE-TIME PADS (ALL TYPES)

CHART IV A



NOTES:

1. The downward trend in one-time pad requirements is due to completion of the mobilization reserve.
2. The yearly operating requirement includes 2400 pads for State Department and 100 pads for FBI. Since each produces this quantity for itself, the planned production line does not reflect this production.

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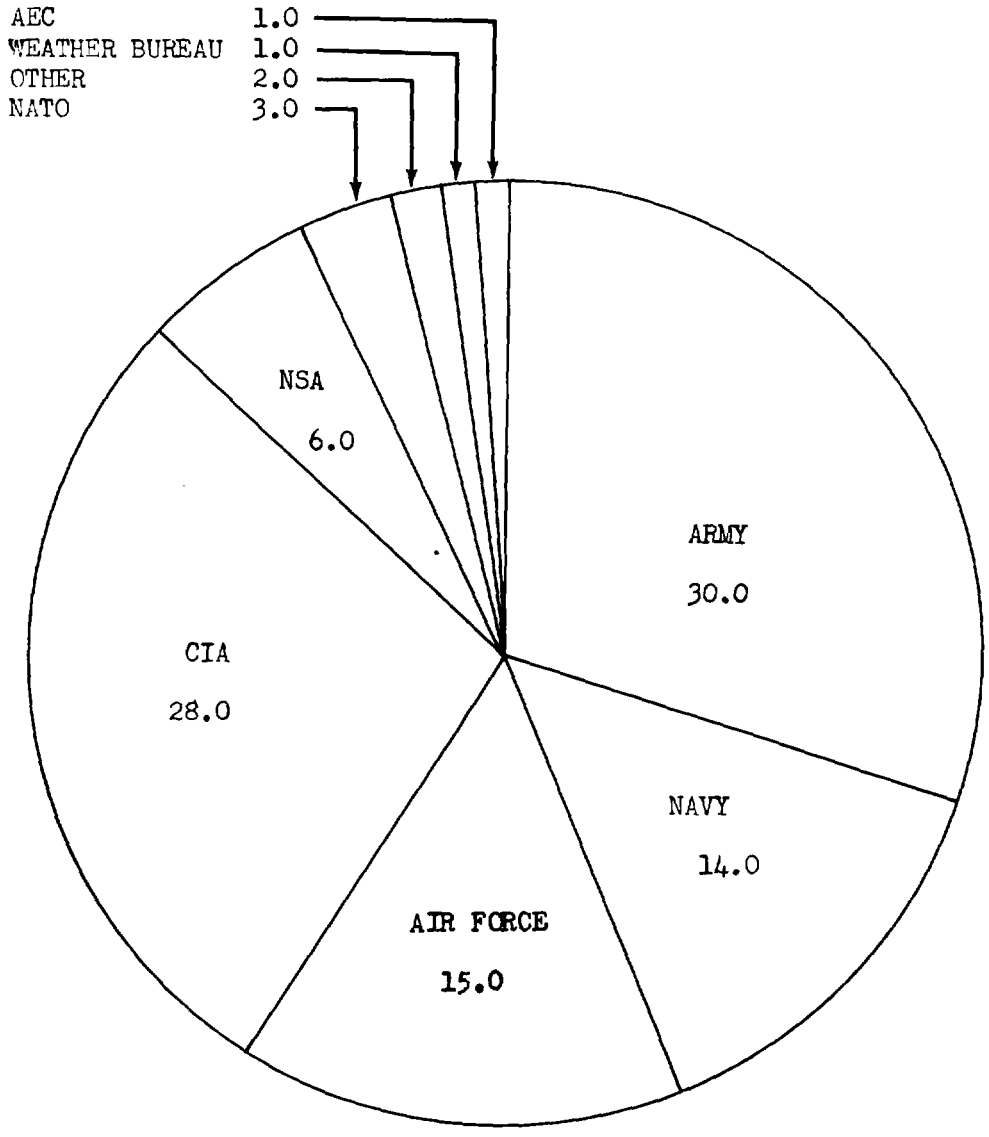
PERCENTAGE DISTRIBUTION OF 1954 NSA PRODUCTION
OF ONE-TIME PADS (ALL TYPES)

CHART IV B



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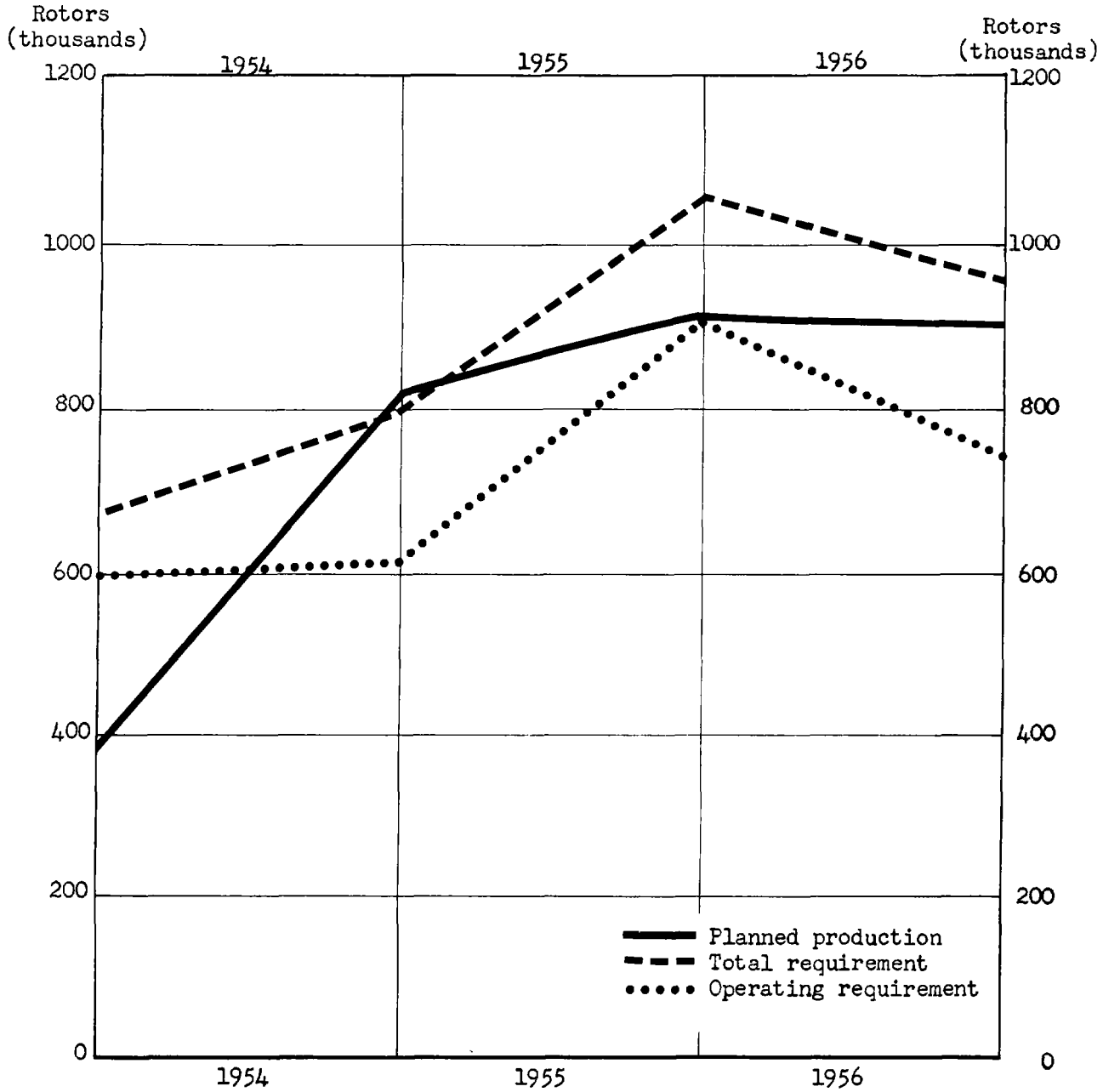
ESTIMATED TOTAL REQUIREMENTS AND PLANNED NSA PRODUCTION
OF ROTORS (ALL TYPES)

CHART V A



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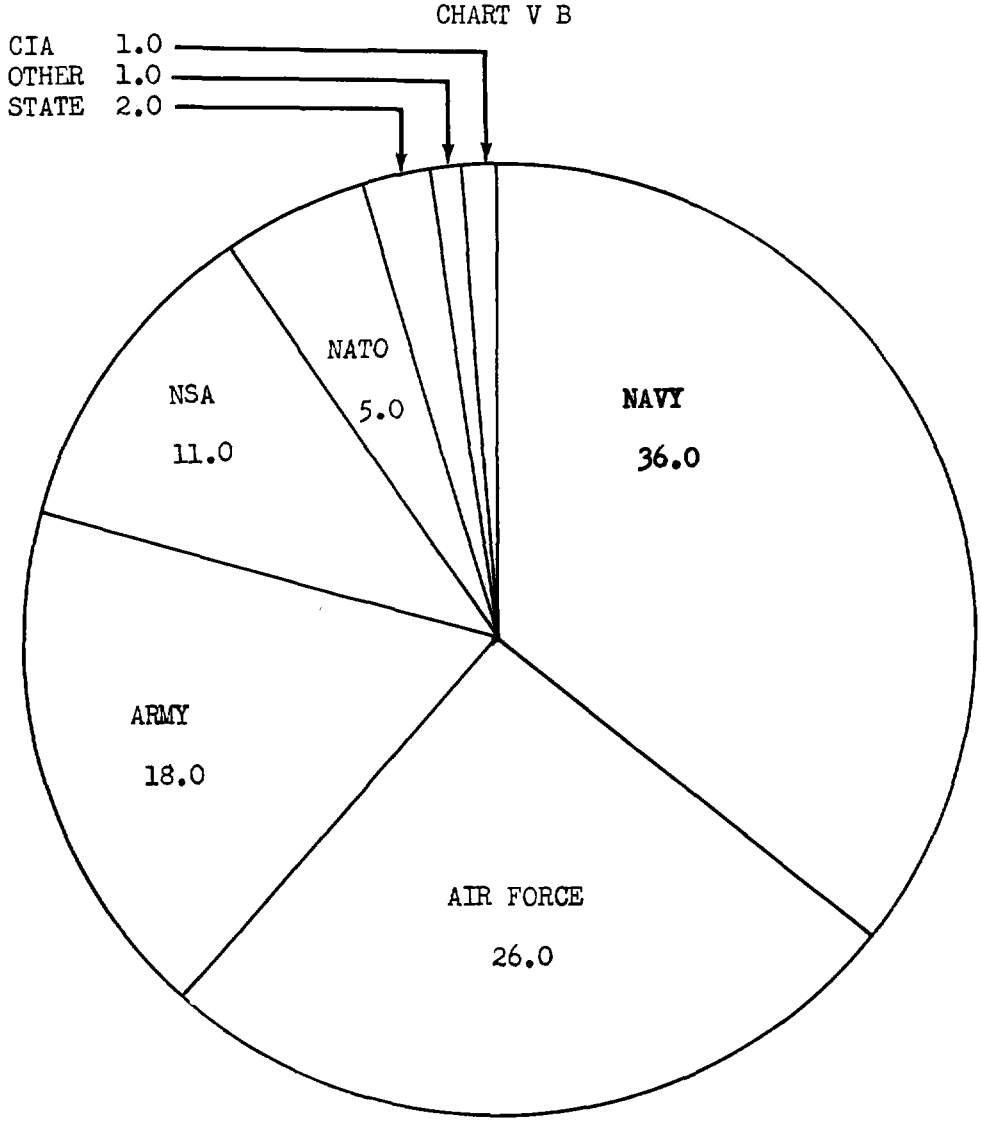
PERCENTAGE DISTRIBUTION OF 1954 NSA PRODUCTION
OF ROTORS (ALL TYPES)

CHART V B



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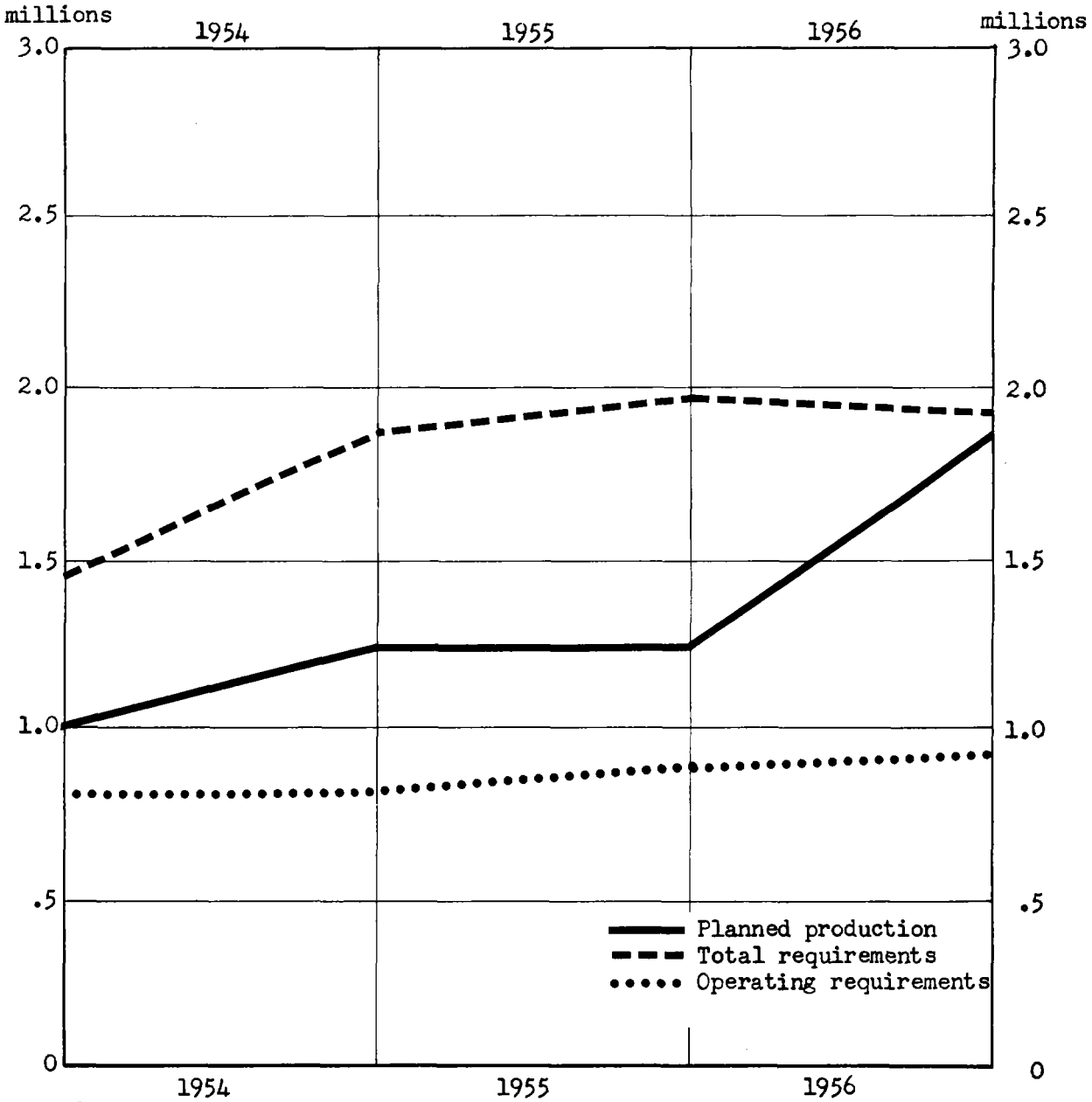
ESTIMATED TOTAL REQUIREMENTS AND PLANNED NSA PRODUCTION OF KEY LISTS
(Expressed in Terms of 3 Page Documents)

CHART VI A



NOTE:

The yearly operating requirement includes 13,500 documents for State Department and a very minor amount for FBI. Since these are produced by these agencies, the planned production line does not include it.

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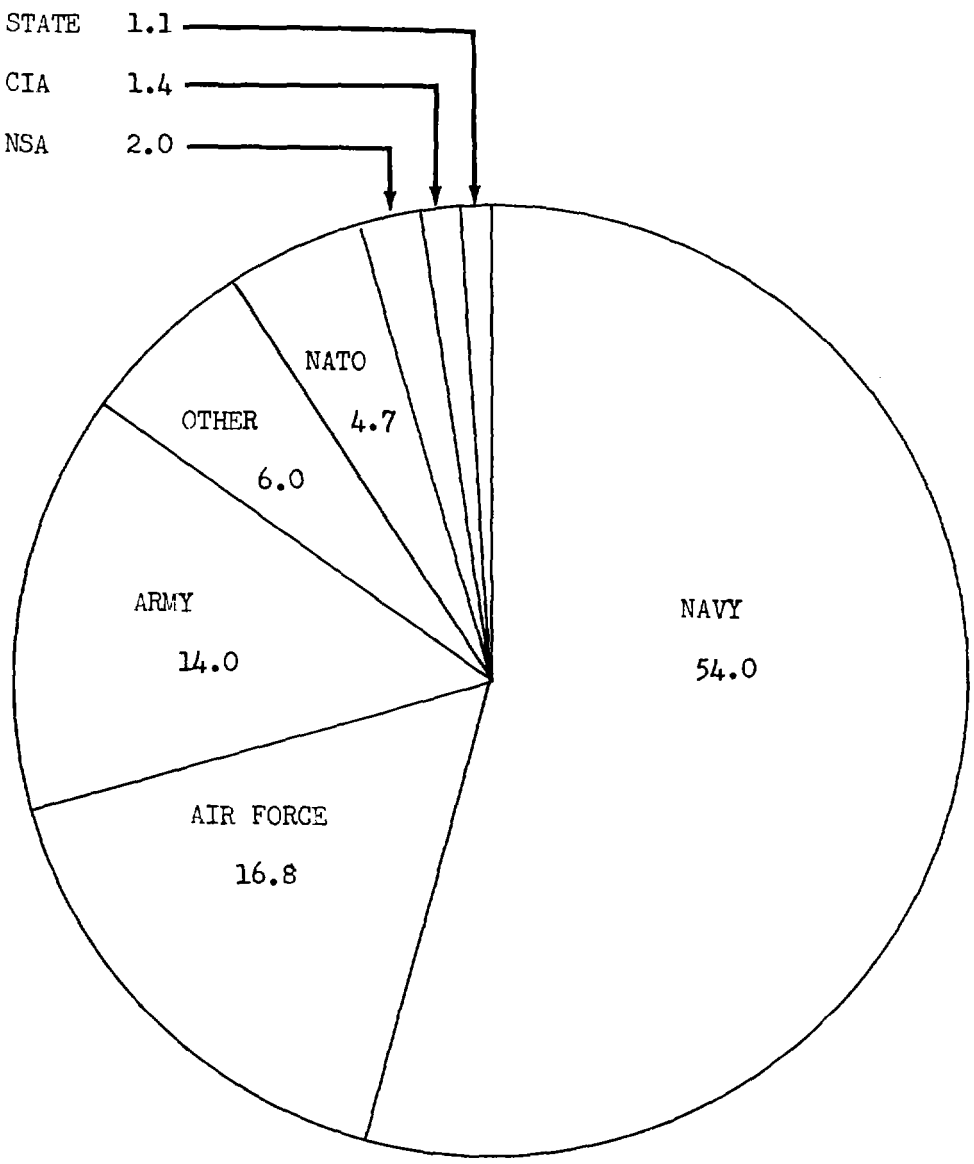
PERCENTAGE DISTRIBUTION OF 1954 NSA PRODUCTION
OF KEY LISTS

CHART VI B



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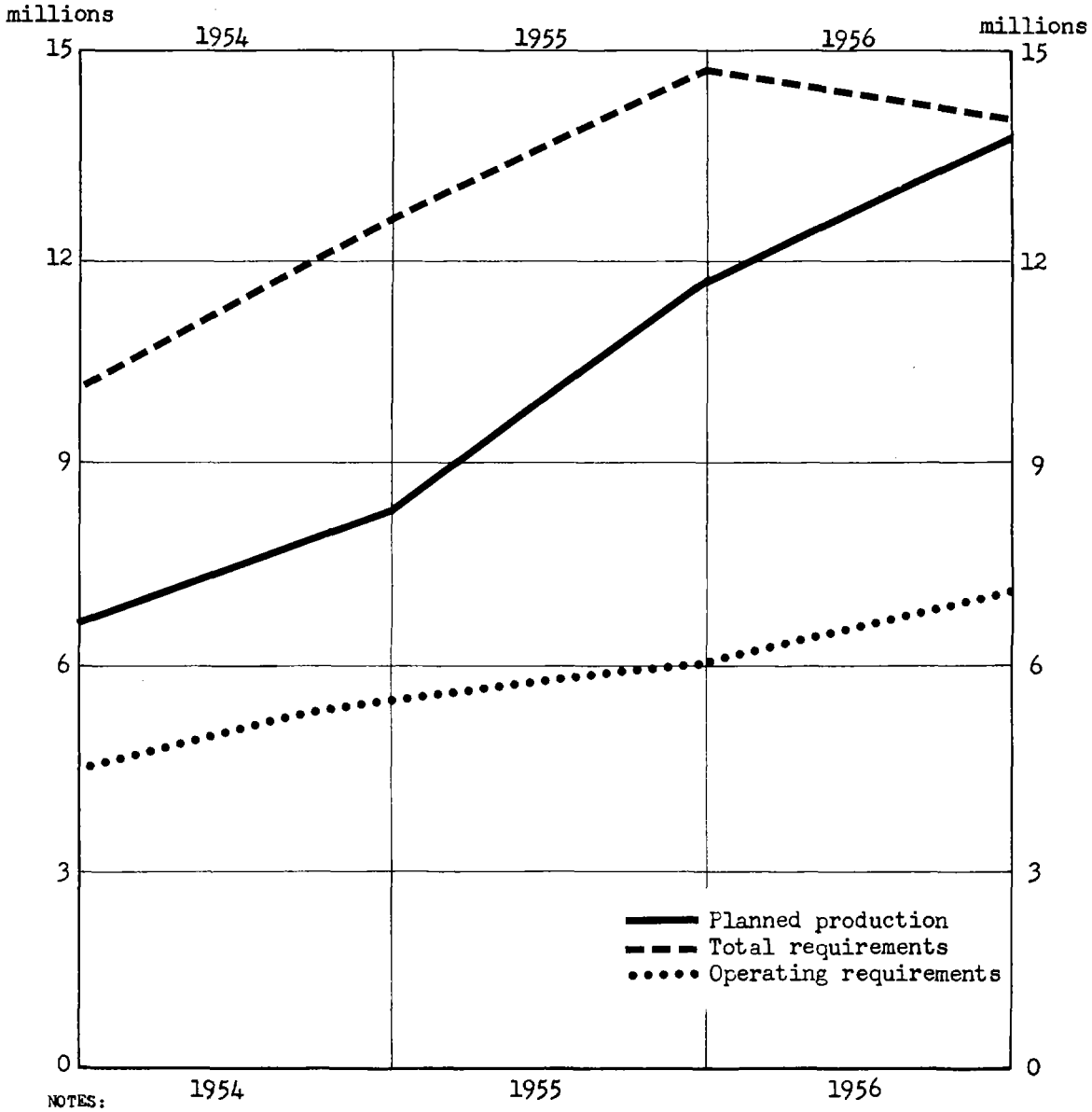
ESTIMATED TOTAL REQUIREMENTS AND PLANNED NSA PRODUCTION OF CODES
(Expressed in Terms of 16 Page Documents)

CHART VII A



NOTES:
1. The mobilization requirement is made up largely of frequently changing tactical codes.
2. The upward trend in operating requirements is caused by the introduction into active usage of some of the tactical codes required for COMBINED, UK/US, and NATO low level communications.
3. The increase in production capacity is due to:
   a. Activation in 1954 of an additional and dispersed unit to compile and prepare documents by IBM methods.
   b. Availability of new high speed (700 doc/min) press.

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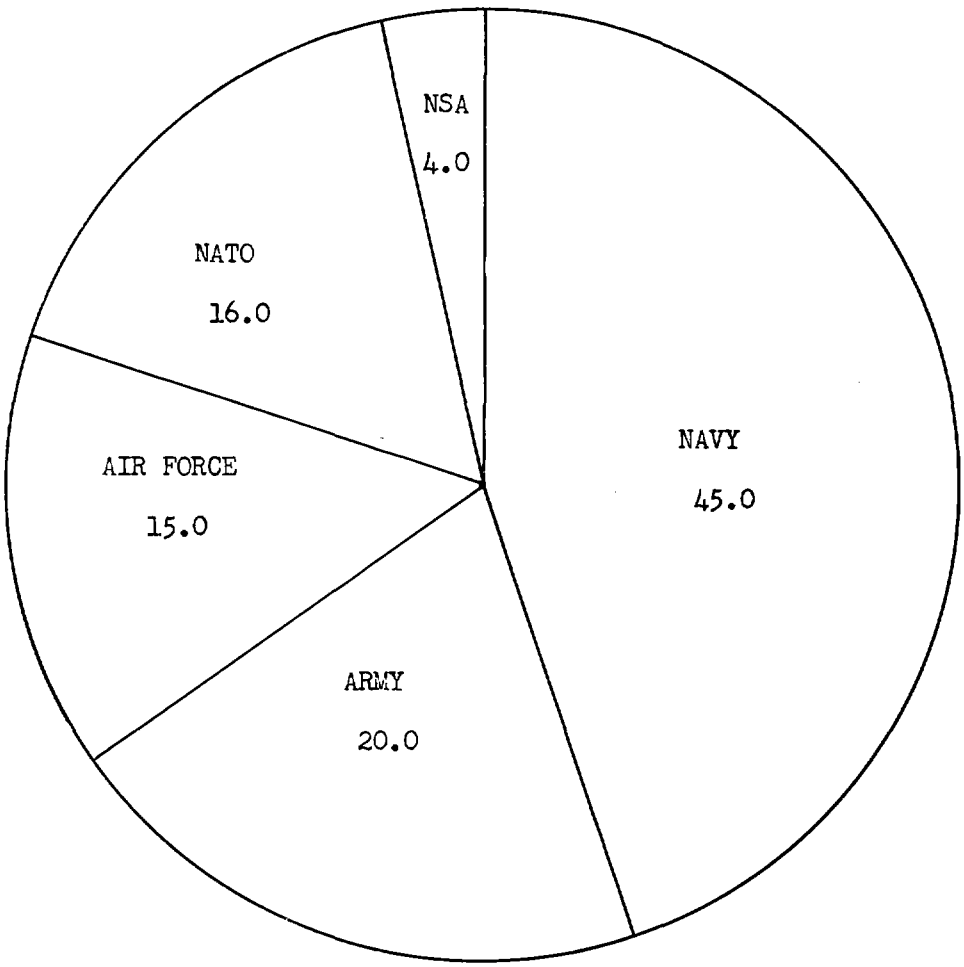
PERCENTAGE DISTRIBUTION OF 1954 NSA PRODUCTION OF CODES

CHART VII B



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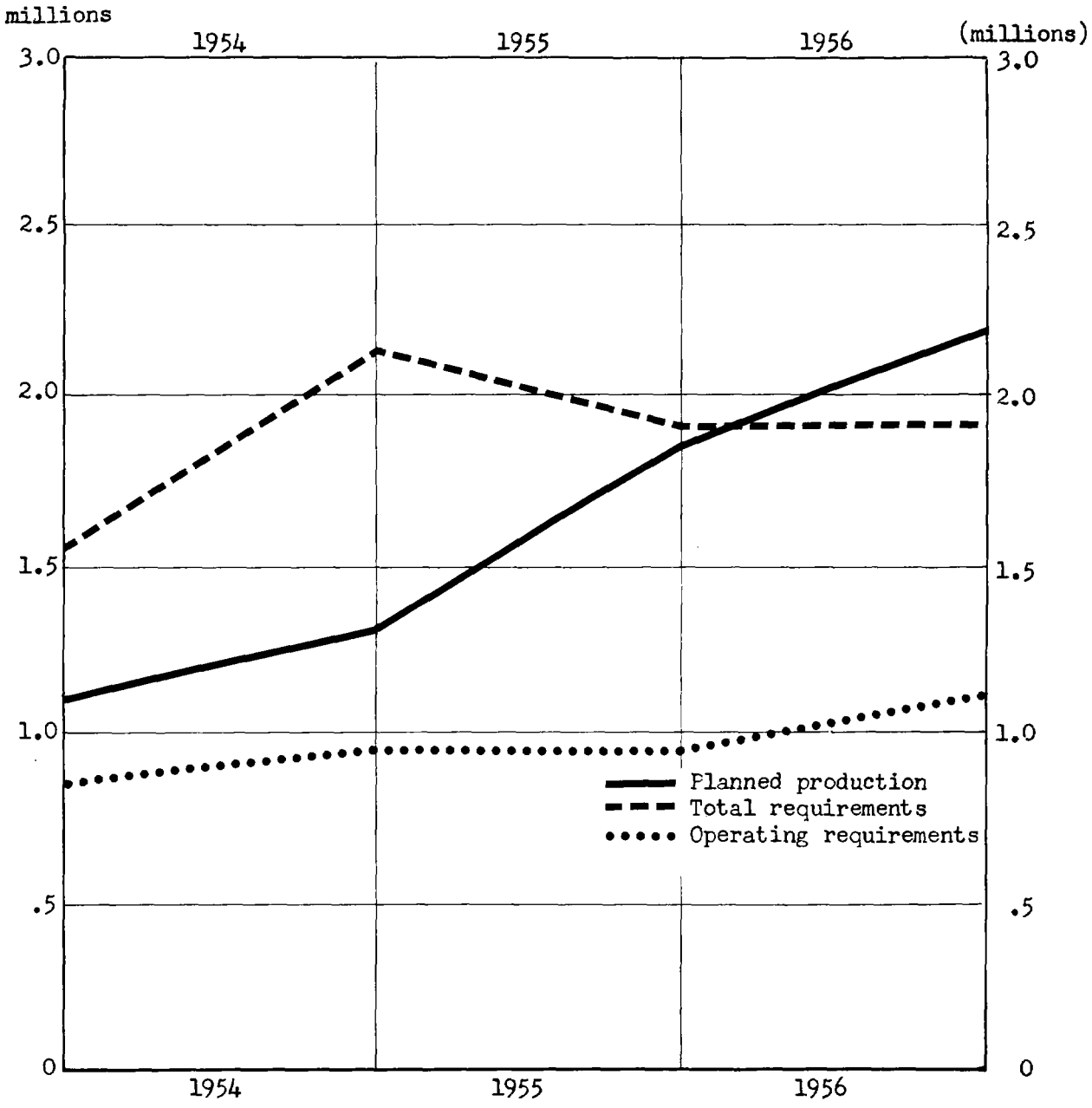
ESTIMATED TOTAL REQUIREMENTS AND PLANNED NSA PRODUCTION
OF GENERAL INSTRUCTIONAL DOCUMENTS
(Expressed in Terms of 32 Page Documents)

CHART VIII A



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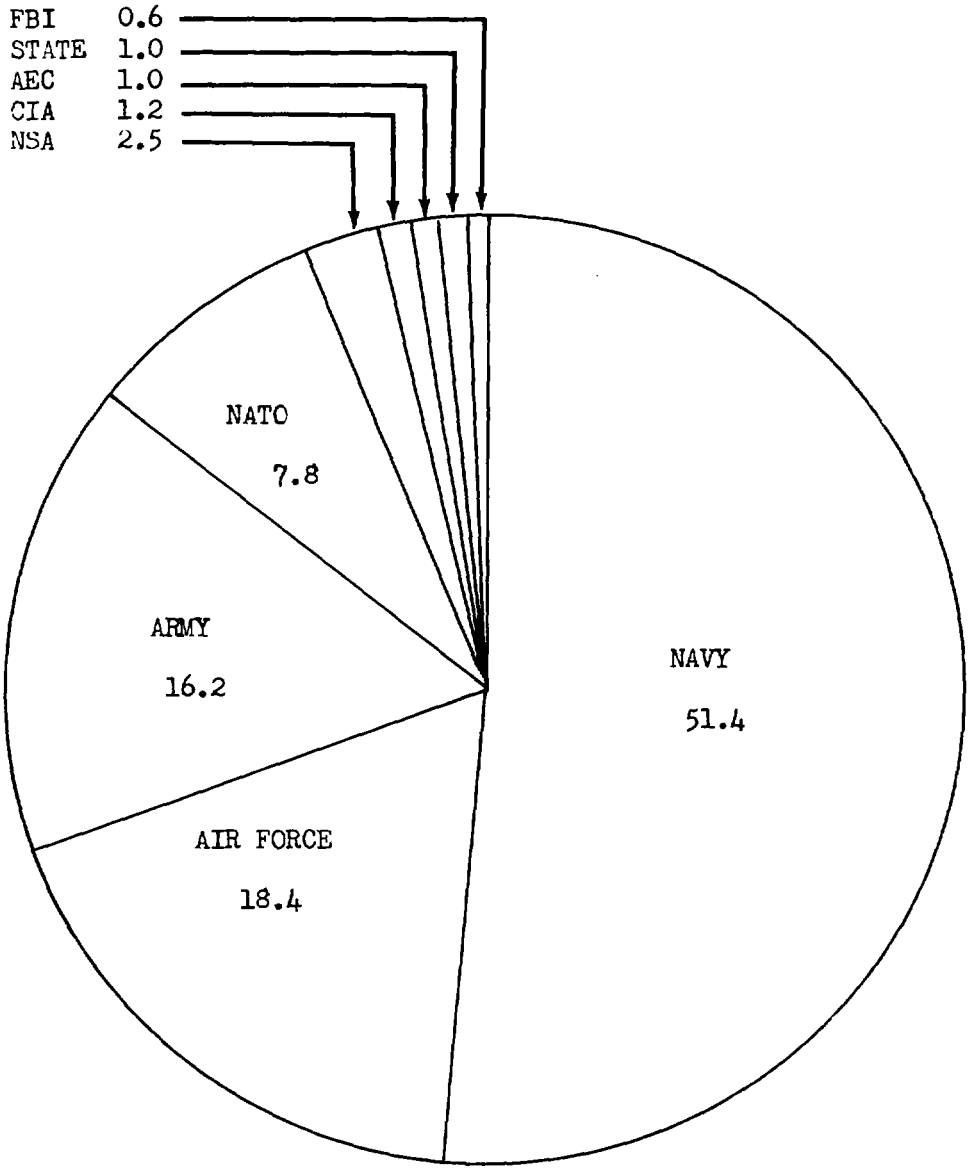
PERCENTAGE DISTRIBUTION OF 1954 NSA PRODUCTION
OF GENERAL INSTRUCTIONAL DOCUMENTS

CHART VIII B



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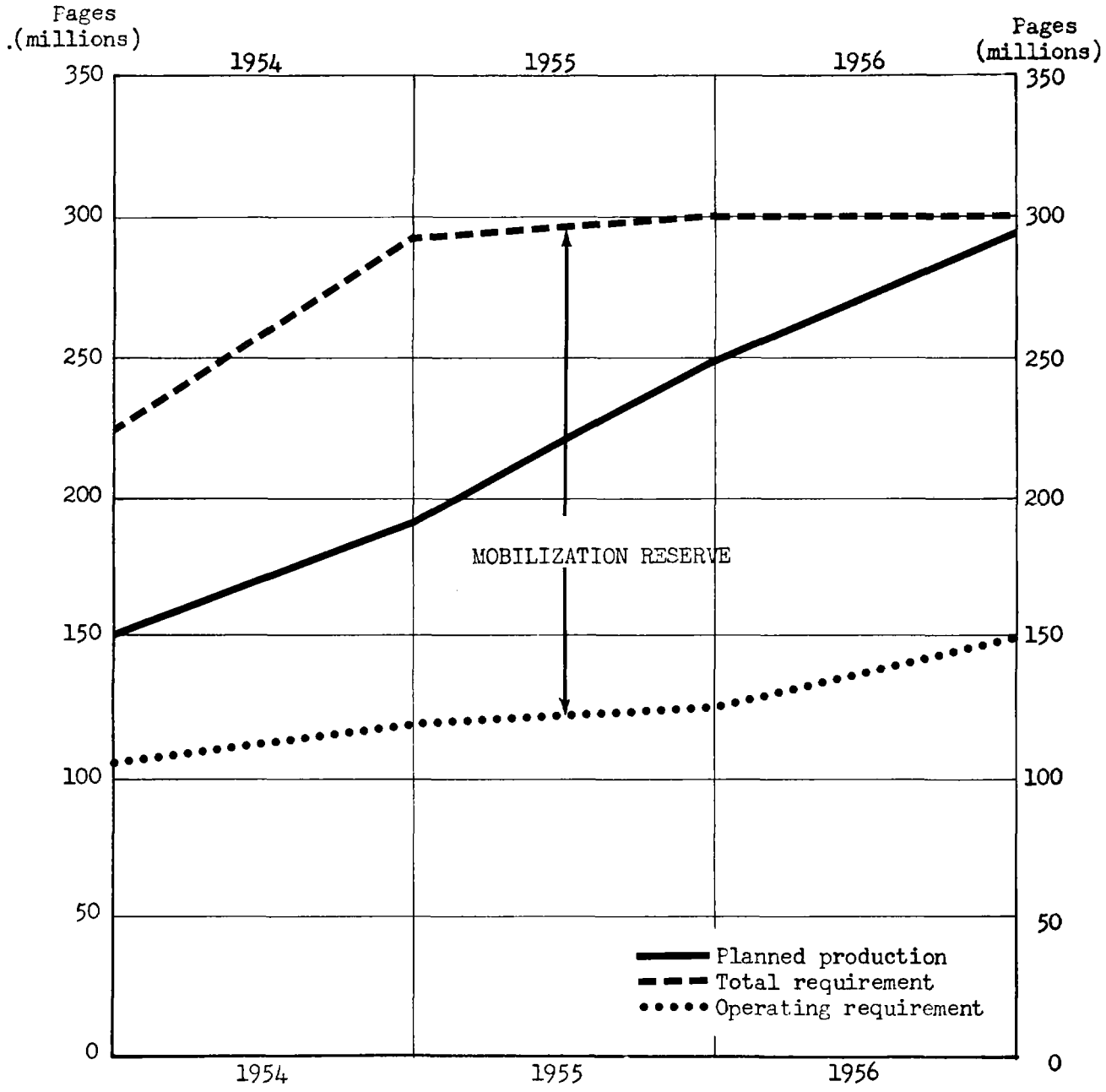
ESTIMATED TOTAL REQUIREMENTS AND PLANNED NSA PRODUCTION
OF PRINTED MATERIALS (Expressed in Pages)

CHART IX A



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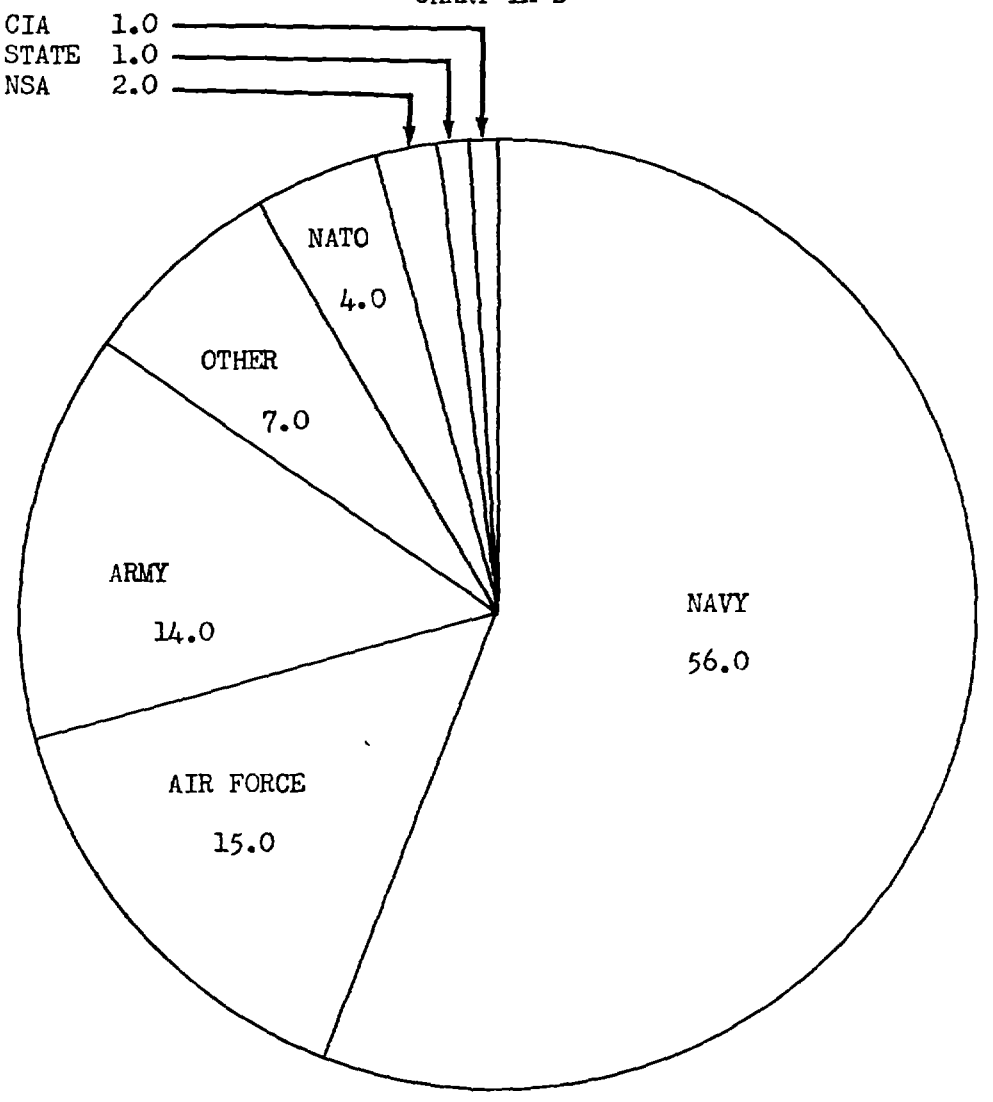
PERCENTAGE DISTRIBUTION OF 1954 NSA PRODUCTION
OF PRINTED MATERIALS (PAGES)

CHART IX B



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