

AD-A028 091

RIA-76-U467

Cy No. 1

TECHNICAL LIBRARY

AD
A0 28091

DRSAR/SA/R-07

USADACS Technical Library



5 0712 01000855 4

AUTOMATED PRODUCTION BASE ANALYSIS SYSTEM (APBA) MANUAL

CPT. MEADE S. CURTIN
MR. WAYNE G. AAMODT
MR. STEVEN KARON

MAY 1976

Approved for public release; distribution unlimited.



US ARMY ARMAMENT COMMAND
SYSTEMS ANALYSIS DIRECTORATE
ROCK ISLAND, ILLINOIS 61201

DISPOSITION

Destroy this report when no longer needed. Do not return it to the originator.

DISCLAIMER

The findings in this report are not to be construed as an official Department of the Army position.

WARNING

Information and data contained in this document are based on input available at the time of preparation. Because the results may be subject to change, this document should not be construed to represent the official position of the Army Materiel Development and Readiness Command unless so stated.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER DRSAR/SA/R-07	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) AUTOMATED PRODUCTION BASE ANALYSIS SYSTEM (APBA) MANUAL		5. TYPE OF REPORT & PERIOD COVERED Report-Final-July 72 to Apr 74
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) CPT Meade S. Curtin Mr. Wayne G. Aamodt Mr. Steven Karon		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Armament Command Systems Analysis Directorate (DRSAR-SA) Rock Island, Illinois 61201		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS US Army Armament Command Systems Analysis Directorate (DRSAR-SA) Rock Island, Illinois 61201		12. REPORT DATE May 1976
		13. NUMBER OF PAGES 117
14. MONITORING AGENCY NAME & ADDRESS (If different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Computer programs Mobilization production PBACOR program AMC Form 1447 Production base analysis Ammunition data PBAVER program PBAPBS program Industrial preparedness UPDAT program PBAMOV program PBAREQ program APBA programs End-item requirements PBAPRNT program GOGO, GOCO Master data file Component requirements AMC Form 1446 COCO facilities		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The automated production base analysis system (APBA system) comprises many computer programs which aid in producing an updated master data tape file. The capabilities of industrial organizations to produce military equipment needed for war or other operations are summarized in this report. The industrial organizations may be of the GOGO, GOCO, OR COCO type. The various types of cards needed to produce a reliable file are described. Many computer operations are outlined.		

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)



SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

PREFACE

At the time of the merger of the US Army Munitions Command and the US Army Weapons Command into the new US Army Armament Command, the new command inherited responsibility for industrial preparedness planning of nonnuclear ammunition items as well as the weapons designed to utilize the ammunition. For more than a year before the merger, the Munitions Command had utilized an automatic data processing system in industrial preparedness planning. That system, with certain revisions that were developed since the merger, is described in this report.

The system and programs described in this report are designed to meet the specific needs of ammunition base retention studies. However, since the basic action of the system is to plan and pace production of end items and components, the system is also suitable for weapons planning or for any other similar production planning problem.

Most of the programs used in this system are written in Fortran and all the programs utilize sequential files. This sequential organization, while it complicated the programming and data preparation effort, was necessary at the time the system was developed because the programs were run at various installations with a variety of equipment. The Joint Committee on Ammunition Procurement (JCAP) at Rock Island Arsenal is now undertaking an effort to restructure the system which utilizes direct access files; however, the programs described in this report will continue to be used until that JCAP effort is completed.

Although much of the information discussed or reviewed in this report was originally obtained before July 1972, the methods of obtaining, recording, and updating are correct as of March 1974. In general, methods of obtaining, recording, and updating information, rather than the information itself, are discussed.

Organizations or individuals who obtain this report from DDC or NTIS and who consider utilizing the system should correspond with Systems Analysis Directorate (DRSAR-SAM) of the US Army Armament Command to receive up-to-date information since changes in industrial planning guidance sometimes necessitates changes in the data base.

CONTENTS

	<u>Page</u>
INTRODUCTION	7
OBJECTIVE	7
BACKGROUND.	7
THE AUTOMATED PRODUCTION BASE ANALYSIS (APBA) SYSTEM	8
GENERAL SUMMARY	8
MANUAL OPERATIONS	14
APBA SYSTEM PROGRAMS.	18
PREPARATION OF THE APBA SYSTEM INPUT	24
ESSENTIAL INPUT ELEMENTS.	24
BASIC TYPES OF DATA CARDS	28
ITEM AND FACILITY DATA SETS	32
AGGREGATION OF DATA SETS.	41
FORMULATION OF THE APBA INPUT-DATA TAPE	45
REFERENCES	47
GLOSSARY OF INDUSTRIAL READINESS PLANNING TERMS.	49
APPENDIX A STANDARD DATA CARD FORMATS	53
APPENDIX B SPECIAL-PURPOSE DATA CARD FORMATS.	81
APPENDIX C NUMERIC DESIGNATIONS FOR SELECTED DATA	93
APPENDIX D SAMPLE PAGE OF THE "DIF" OUTPUT OF THE PBAREQ PROGRAM.	109
APPENDIX E INSTRUCTIONS FOR USE OF THE PBACOR PROGRAM	113
DISTRIBUTION LIST.	117

Next page is blank.

INTRODUCTION

OBJECTIVE

1. This document is intended to provide the industrial preparedness planner with a general knowledge of the operation of the Automated Production Base Analysis (APBA) system and to assist the ammunition-production-data specialist in the formulation, revision, and validation of the APBA master data file necessary to operate the system.

BACKGROUND

2. The U.S. Army Munitions Command was responsible for the development of industrial preparedness planning relevant to ammunition and chemical equipment items up until July 1973. At that time, the merger of Munitions Command with Weapons Command resulted in the formation of a new organization entitled Armament Command. Thus, the Armament Command (ARMCOM) inherited industrial-preparedness-planning responsibility for nonnuclear ammunition items as well as the weapons designed to utilize the ammunition.

3. The basic document developed for industrial-preparedness-planning by Munitions Command is entitled "The Industrial Readiness Assurance Program Production Base Analysis",¹ formerly referred to as the "Base Retention Study." This document provides an analysis of the capability of the Army to meet requirements for ammunition in the event of mobilization. This analysis is carried out on an individual item and facility basis to determine whether the allocation of resources is sufficient to meet mobilization requirements or not. Consequently, the Production Base Analysis is published in two volumes: Part I - Item Analysis Summary and Part II - Facility Analysis Summary. Part I is subdivided into four sections, each of which is composed of functionally related items, as follows: end items (items ready for issue), metal parts (including selected nonmetallic materiel), propellants and explosives (including selected chemicals), and loaded components (subassemblies). The data for the analysis of each item is supplied by the applicable responsible agency, determined as follows: small arms ammunition (less than 40-mm) planning is the responsibility of Frankford Arsenal; major-caliber ammunition (40-mm and larger, but nonnuclear/nonchemical) planning is the responsibility of the ARMCOM Production and Procurement Directorate; chemical ammunition and equipment planning is the responsibility of Edgewood Arsenal. Part II, the facility analysis summary, contains an analysis of each of the GOGO, GOCO, and COCO facilities that are scheduled to produce the ammunition and equipment items listed

¹The Industrial Readiness Assurance Program Production Base Analysis, AMSU-PP-PDIM, January 1974; U.S. Army Armament Command, Rock Island, Ill. SECRET Report.

in Part I. Each analysis includes the Government-owned equipment integral to that facility and is prepared by the agency responsible for the item produced by that facility.

4. Prior to the development of an Automated Production Base Analysis (APBA) System in July 1972, preparation of the Production Base Analysis was a protracted manual process requiring approximately 6 man-years of work over a 9 month period. The APBA system, developed by Munitions Command Operations Research Group, consists of a series of computer programs that reproduce, with a high degree of accuracy, most of the manual procedures formerly employed to prepare a Production Base Analysis. The remaining manual operations are necessary to update the APBA master data file and validate the subsequent system output.

5. Modifications to the APBA system are currently being formulated that will reduce the effort required for the remaining manual operations and simplify operation of the overall system. Subsequent system changes will address incorporation of additional improvements and the provision of additional capabilities for increased system applications. Included in the latter category is modification of the system to provide a production base plan in consonance with AMC directives² and adaptation of the system to meet the industrial preparedness model requirements established by the Joint Committee for Ammunition Procurement (JCAP).³

THE AUTOMATED PRODUCTION BASE ANALYSIS (APBA) SYSTEM

GENERAL SUMMARY

6. System Description. The Automated Production Base Analysis (APBA) System consists of a series of computer programs that assist the data specialist in preparing a production base analysis by performing routine mathematical calculations in a timely manner. The program logic was developed with the assistance of personnel assigned to the MUCOM Production and Procurement Directorate and conforms to the procedures and guidelines outlined in the DOD Industrial Preparedness Planning Manual.⁴ The logic and procedures of the APBA programs are not presented in this user's manual. It is felt that these program details will only be of

²Letter, US Army Materiel Command, AMCRP-OIP, Subject: "Production Base Plan (RCS AMCRP-124)," dated 8 June 1972, UNCLASSIFIED.

³Memorandum, Joint Panel for Development of a Coordinated Management System for the Ammunition Production Base, RCS: DD-I&L(AR) 1072, subject: "Final Report on the Ammunition Production Base Economic Decision Models", 10 April 1972, UNCLASSIFIED.

⁴DOD Manual 4005.3-M, Industrial Preparedness Planning Manual, Department of Defense, 24 July 1972, UNCLASSIFIED.

use to programmers or systems analysts who must alter or build on the APBA programs or data bank. Because the programs have been and are subject to revision, the detailed documentation has been incorporated into comment cards in the programs themselves, and pertinent comments, together with narrative descriptions of programs, can be extracted as needed for those interested. A printed listing of these comments and narratives, combined with the programs flow charts printed by the AUTOFLOW system, constitutes the APBA Programmer's Manual.⁵ To utilize the APBA system, the data specialist must construct initially a master data file. This file is transferred to a standard computer tape and contains the information necessary to analyze each item and facility selected for inclusion in the mobilization production base. The steps that are required to produce a master data file on a data tape are outlined in FIGURE 1. This master-file data tape is then used as the primary input to the programs that comprise the APBA system. Each program requires the latest master file (data tape) as input, performs various operations with the data, and produces either a new master-file data tape, a printed summary of the data operations performed, or both. In general, the master file output from one program becomes the input to the succeeding program. One cycle of the APBA system operation, depicted in FIGURE 2, would involve the following:

7. The ammunition data specialist uses the latest master-file data tape as a reference point for preparation of a new production base analysis. Initially, he prepares source documents, from which data cards are punched, that update the master-file data tape, i.e., that reflect such additions, deletions or revisions to the item and facility data stored on the master file as are required at that time. The data cards and the master-file data tape constitute the input data required by the UPDAT program. The UPDAT program incorporates the data changes into the existing master data file and produces a new (updated) master-file data tape. The data specialist then prepares a set of requirement cards reflecting the revised mobilization requirements for each ammunition and equipment end item listed in the master file. (Such cards need not be prepared for end item requirements that remain unchanged.) The requirement cards and the updated master-file data tape then provide the input to the PBAREQ program. The PBAREQ program calculates the quantity and type of components required to satisfy the end item requirements using the component breakdown data stored in the master file. The PBAREQ program provides as output a new master-file data tape (that includes the new end item and component requirements), a listing of the new master-file data tape, and a difference summary. The difference summary lists the end item/component requirements and the facility

⁵Aamodt, W. and Karon S., US Army Munitions Command Operations Research Group, APBA Systems Programmer's Manual, US Army Systems Analysis Office, Rock Island Arsenal, Illinois, UNCLASSIFIED. (A Computer Tape)

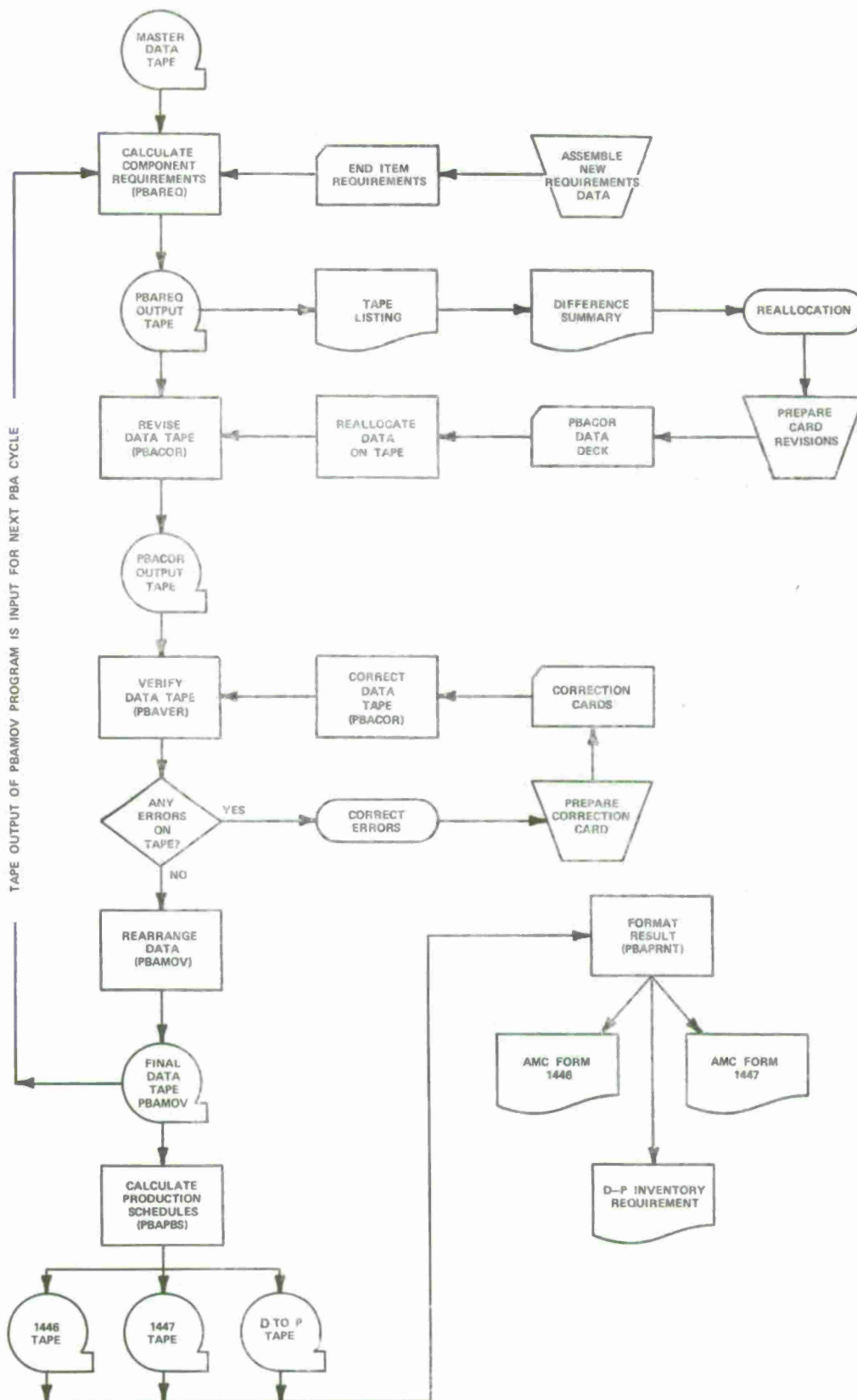


Figure 1. Procedure for Production of Automated Production Base Analysis

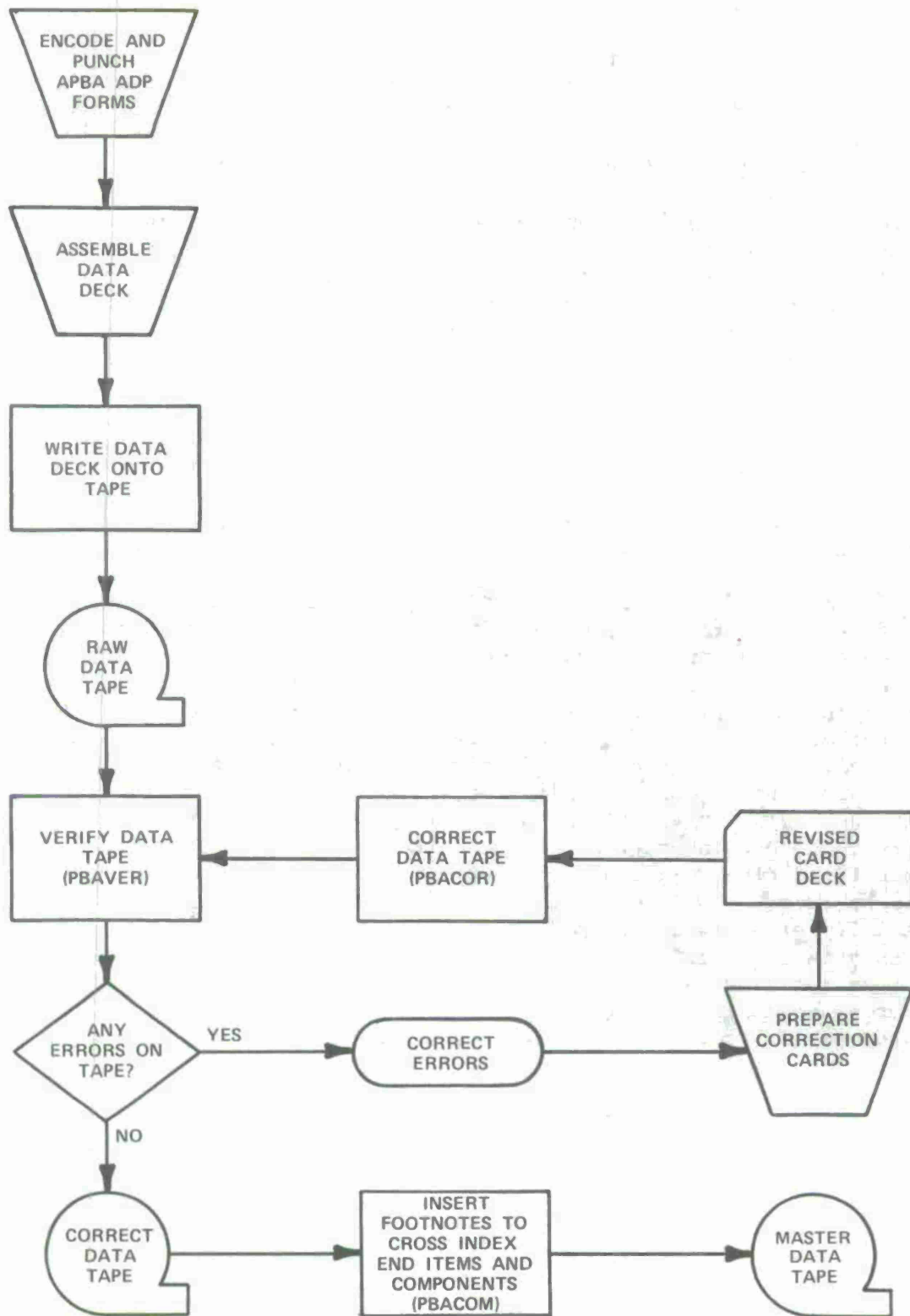


Figure 2. Procedures for Creation of a Master Data Tape

production assignments specified on the input master data tape as well as the newly calculated requirements transcribed onto the output master data tape. The data specialist uses this difference summary to reallocate facility production assignments and/or capabilities manually so that a new production base is planned to meet the new mobilization requirements. These data revisions entered on source documents and keypunched to provide data cards are incorporated into the PBAREQ output master data tape using the UPDAT program. A printout of the UPDAT master data tape is then reviewed by the data specialist to determine if the necessary facility reallocation data have been entered completely and correctly. If not, the UPDAT program or the PBACOR program is utilized to make the final master-file data-tape changes. (The PBACOR program is a data correction program that is employed when there are a limited number of data corrections to be made. Correction of the data on the tape is accomplished on a one-for-one basis, using as a reference point the location of each data card on the master-file data tape, i.e., one corrected data card is inserted for each incorrect data card. As this data correction process is very sensitive to input data errors, the PBACOR output must be validated for content and correctness using the PBAVER Program. The PBAVER program examines a master-file data tape and determines if the data are stored on the tape in the format required to operate the APBA system program.) The master-file data tape that includes the latest revisions and has been validated is used as the input to the PBAPBS program. (This same master data tape is also utilized as the input tape for the succeeding cycle, where another new production base analysis is to be produced.) The PBAPBS program calculates a planned schedule of production for each facility assigned production responsibility for an item, compiles an item and facility analysis for each item and facility listed on the tape, and determines the D-P inventory requirement for each item. These results are then transcribed, in condensed form, to an output tape. This tape is read by the PBAPNT program and a production base analysis is printed on specially prepared computer paper. Multiple copies of the production base analysis are obtained using one of two methods: 1) The PBAPNT program is rerun as many times as necessary to provide the number of computer-paper copies desired; 2) the computerized production base analysis is photographically reduced and reproduced to provide the number of hard copy documents desired. In general, the first method is employed for limited distribution (fewer than 10 copies) while the second method is utilized for final distribution to the applicable industrial-preparedness-planning agencies.

8. System Input. The basic input to the APBA system is a master data file assembled by the data specialist and transcribed onto a standard computer tape. This tape contains a series of data sets, each representing one facility, end item or component included in industrial preparedness planning. Each data set is assembled from a series of data cards, with each data card used to store a particular type of information. (The July 1974 APBA master-file data tape contains approximately 21,000 data cards representing nearly 400 facilities and 1000 end items and components.) The first 2 card columns on each data card are used to identify

the type of data stored while the remaining 78 card columns contain the applicable data. Card column 1 invariably contains a letter while card column 2 contains a number, e.g., U0, A1, B3. Thus, while 260 types of data cards are available for use with the APBA system, only 23 are necessary to meet the current requirements for data storage. (The data content and card format for each type of card used in the APBA system are detailed in Appendixes A & B of this manual.) The addition of new data to the master file is accomplished using the existing card types or by the formation of new card types for the specific data requirements. The end item and component data presently stored includes: item nomenclature (description, DODAC, SSN, etc.), mobilization requirements (Levels 1 through 4 and retention level for each using service), month by month build-up of user requirements, planned buy quantities {FYDP or the Deputy Chief of Staff for Logistics Data Processing Center (DCSLOGDDPC) budget run}, responsible agency, component breakdown data (procurement factor limiting component/operation, etc.), and related cost data. The facility data currently filed includes: facility description (firm's name and address), Government-owned equipment data {Assistant Secretary of Defense (PEP) package, number of pieces, replacement value, maintenance value, etc.}, retention priority for each item produced, product assignment(s), production capabilities {minimum sustaining rate (MSR), 1-8-5, 2-8-5, and maximum production rate (MAX)}, production leadtime(s), and various conversion, replacement or construction cost estimates.

9. Retrieval of the data stored on the tape is keyed to a particular data card type and a specific item or facility. Each discrete end item or component is assigned a unique four- or five-digit number while each facility is assigned a unique six-digit number. Thus, only the information required for a given operation is secured from the file at a given instant during execution of the APBA system programs.

10. System Output. The output produced by the APBA system is a Production Base Analysis (PBA). This document provides an analysis of the capability of the production base (developed by the industrial preparedness planner) to meet approved mobilization requirements for ammunition, given the supposition that M-day occurs the last day of the current fiscal year. The PBA itself consists of item and facility analyses and a D-P inventory requirement summary. Each item analysis, modeled after AMC Form 1446, consolidates the information necessary to evaluate the readiness status for post M-day production of an individual item of materiel. (The resultant production schedules are feasible, but may not be optimal in terms of time or cost, as they are based on the resources allocated manually by the specialist responsible for industrial preparedness plans relevant to that item.) Each facility analysis, modeled after AMC Form 1447, consolidates the information necessary to evaluate the readiness status of selected Government-owned Government-operated (GOGO), Government-owned contractor-operated (GOCO), and contractor-owned contractor-operated (COCO) facilities to produce assigned items of materiel post M-day against specific production

schedules. The D-Day to P-Day* (D-P) inventory-requirement summary displays the net production deficit or surplus (mobilization requirement versus production offset) of each item, given the applicable base temperature, for each month in the D-P period as well as for the entire D-P period itself. (The D-P inventory-requirement summary presently contains neither item cost data nor assets on hand, although the inclusion of both factors in the APBA system is planned.) The current PBA, produced using the APBA system consists of approximately 3000 pages of linked computer paper. Options exist in the PBAPBS program to produce this output without headings, to be printed on preprinted stock, or with headings to be printed on plain paper. Each pair of computer pages corresponds to a single item or facility analysis form. The total print-out is subsequently separated into pairs of computer sheets and a more compact and manageable document obtained by photographic reduction and reproduction of the original computer pages. The PBAPBS program also produces a tape (Data set name = K43UNPAC) which lists all items and their fastest possible (unpaced) production schedule. This tape is useful as input for "true pacer" programs or for capability analyses.

MANUAL OPERATIONS

11. There are basically three operations that the industrial preparedness planner must perform manually while utilizing the APBA system. These operations, outlined in paras 12 through 20 following, consist of preparing or revising a master data file, allocating production facilities or enlarging capabilities to meet new requirements, and validating the system output. Each of these operations may require several man-months of work over a period of several weeks, with the requirements for a particular run dependent upon the volume of data to be processed. Additionally, the individual APBA program outputs are examined to verify completion of the desired operation by the computer, but this rarely requires more than a few minutes for each program. A detailed discussion on the preparation of the master data file is provided in the section PREPARATION OF THE APBA SYSTEM INPUT of this manual. Discussion of the validation of the APBA system output is limited to paras 17 through 20 as the detection of data errors that are not a direct result of improper insertion into the master data file is beyond the scope of this manual. (Only the industrial preparedness planner responsible for an item or facility can confirm the accuracy of the data once they are properly entered on the master file.)

12. Preparation/Revision of the Master Data File. Preparation of the initial master data file involves the collection of the data elements detailed in PREPARATION OF THE APBA SYSTEM INPUT by the data specialist from various source documents. The data relevant to each item and facility that is considered in the final production base analysis must be included in the data assembled for this master file. The data so collected are

*See Glossary for better explanation of D-P inventory.

then transferred to special Automatic Data Processing (ADP) coding forms designed for use with the APBA system. Each form contains a series of distinct card formats that are used to store the diverse data for a single item or production facility.

13. Once the appropriate data are entered on the forms, data cards are punched from the formats on the forms, using a standard IBM 29 Key-punch machine. The individual data cards punched from each form are then aggregated into card sets representing individual items or facilities, as originally entered on the special forms. The card sets are then assembled into groups of related items or facilities, such as metal parts, end items, etc. These card groups are then arranged in a specific sequence, and certain data control cards added, to form an input data card deck. The data in the resultant card deck is then transferred to a data tape by the use of a standard card-to-tape transcription program. This data tape is then inspected, using the PBAVER program, to determine if the data are stored on the tape in the correct format and sequence. If no format errors are found, the data tape is ready for use as the input tape to the APBA system. If errors are found, the UPDAT program or the PBACOR program is utilized to correct the tape and the PBAVER program is used to inspect the revised tape.

14. The preparation of a new data tape is simplified considerably if an input data tape is available that was previously used with the APBA system. In this case, the basic framework utilized by the APBA system for data storage is already established on the tape. The obsolete data are then removed and the new data are added again using the UPDAT program or the PBACOR program and a deck of correction cards. The corrected data tape is then examined using the PBAVER program, and used as the input data tape for the APBA system (if no errors are found). Preparation of an input data tape by either method is a lengthy process that requires one to three man-months of work, depending upon the size of the data file. Hence, planning is currently in progress to reduce the manual effort required to prepare an initial input-data tape and revise an existing input tape.

15. Allocation of Production Facilities and Capabilities. The production readiness analyst develops an ammunition-production base plan by designating selected production facilities to furnish the materiel necessary to meet specified ammunition requirements at mobilization. Facility product assignments and production capabilities are apportioned so that the total ammunition demand at M+24 is satisfied by the aggregate ammunition production at M+24. The materiel required to support the production of ammunition at a specified level is determined using the PBAREQ program. The program utilizes a new set of ammunition end item requirements on data cards and the component breakdown data on the master data file (tape) to calculate the new materiel requirements. The program provides the user with a difference summary that lists, in worksheet form, the new requirements, old requirements, and the production base previously developed by the analyst to meet the old requirements.

(A sample difference summary is attached at Appendix D of this manual.) The data specialist uses this summary to reallocate the existing facility production base to meet the new requirements and to assemble a card deck that will insert the revisions on the PBAREQ output tape. This allocation process consists of comparing the total facility production capability assigned to each item and the requirement for that item. If the item requirement and the assigned production capability are equal, no action is required. If there is excess capability assigned to the item, based on the new requirement, the surplus production capacity may be assigned to another item or left as is, at the discretion of the analyst. (The final APBA printout will simply label unutilized production capacity as "Excess to the stated mobilization requirements"; the excess facility will not be automatically deleted by any of the APBA system programs.) If there is insufficient capacity to meet the new item requirement, additional production capability is allocated to the item. The additional capability is obtained by increasing the production capability of an assigned producer through the provision of additional resources (usually dollars or equipment), assigning additional existing facilities to produce the item (usually from items assigned an excess capability, based on the new requirements), or planning the establishment of a facility post M-day to meet the production deficit. Care should be taken in planning M-day actions to meet production deficits because, if these M-day facilities are added to the data tape, they may not be appropriate in subsequent runs. As a general rule, it is advisable to add M-day actions only when specific plans exist for construction of additional facilities. If no such plans exist, the computer will specify the needed M-day actions for a given run, without any need for revision in the data tape.

16. This allocation of production facilities and/or capabilities to meet the new mobilization requirements is performed with each item listed on the master data tape. A similar process is followed to meet the new hot-base requirement (the budget buy planned for the current fiscal year). The production facilities are assigned current production rates, starting with the facility assigned the highest retention priority, such that the facility is neither utilized below the MSR rate nor above the maximum rate. Once this allocation process is completed, the data specialist prepares a data deck, that is used with the UPDAT program or the PBACOR program, to incorporate the necessary revisions into the master data file. (Preparation of a PBACOR data deck is detailed in Appendix E; preparation of an UPDAT data deck is detailed in the UPDAT program users' manual.)⁶ The revised master data file is then validated using the PBAVER program, which checks for data elements improperly added to or deleted from the file. If no errors are found, the newly revised data tape provides the input to the next stage of the APBA system. The data

⁶User's Guide to the Base Retention Analysis System Update Procedure, AMSMU-MI-SE, US Army Munitions Command, 12 April 1973.

errors detected in the file are corrected using the UPDAT or PBACOR program and the tape is again examined using the PBAVER program, with the process repeated until an error-free master data file is obtained.

17. Validation of System Output. Validation of the APBA system output involves the review of each item and facility analysis form contained in the final production base analysis. Review of the data on each form is generally restricted to examination of section IV of the item analysis form and section III of the facility analysis form, since the other data are simply retrieved from storage on the data tape.

18. Section IV of the item analysis form contains the planned mobilization production schedule, from a hot and/or cold base, for each facility assigned to an item. Each production schedule is developed from the standard assignment of a production goal to the facility (generally equal to the maximum capacity) and standard production-acceleration curves, unless special override cards were previously inserted into the item data set. Hence, if an unusual or apparently incorrect production schedule is found in section IV, the data set for that item on the input tape should be examined to see if nonstandard production goal or acceleration cards are included. If they are, the cards may prove to be improperly formulated. (This is particularly applicable with respect to the production of propellants and explosives.) If the problem does not stem from nonstandard data cards, the entire item data set listed on the input tape should be examined for the proper entry of the unit of measure. An artificial production deficit can be created by the use of the incorrect unit of measure, i.e., the max capacity of a facility is entered as 100E (each) rather than 100K (thousands). Additionally, check the production leadtime ("40" months has been inadvertently entered when "04" months was correct) and the maximum capacity entries on the facility production capability data card. Finally, the desired production response, from hot or cold base, should be derivable from the applicable standard production-acceleration curve. If not, then nonstandard production-acceleration cards should have been used. If the production schedule problem is still not rectified, the solution may require modification of the program logic rather than correction of the input data. In this case, the activity responsible for operation of the APBA system should be notified of the difficulty.

19. Section III of the facility analysis lists the individual items each facility produces, the maximum capacity assigned for production of that item, the month the maximum production was attained (if applicable), and the maximum planned utilization of the facility for each of the items. The maximum planned use entry for a given item in section III of a facility analysis should be equal to the production goal assigned to that facility in section IV of the corresponding item analysis. If not, the problem can be corrected using the same procedures detailed above to solve production schedule problems.

20. If a significant number of data corrections are necessary, the input data tape is revised using the UPDAT or PBACOR program, with the PBAPBS and PBAPNT programs rerun afterwards to provide a new production base analysis. This new PBA must also be examined to insure that the proper production schedules and product assignments have been generated. If few changes are necessary, the corrections are made directly on the original printed output prior to reproduction and final publication of the production base analysis.

APBA SYSTEM PROGRAMS

21. A total of the eight programs have been developed to assist the industrial preparedness planner in the preparation of a production base analysis using the APBA system. The name, operation performed and approximate execution time of each program is summarized in Table 1. Each program utilizes a data tape (master file) and data or instructions provided by the user or included in the program to perform the required operation. Each program provides the user with a new data tape and/or a printed output summary. Each of the programs, with the exception of the PBAPNT program, are written in Fortran IV as the APBA system was originally designed on a UNIVAC 1108 computer. (The PBAPNT program is written in COBOL.) The programs were subsequently modified for use on an IBM 360 series computer, (a 360/40 model at Joliet, IL and a 360/65 model at APB, MD and Rock Island, IL) as operational responsibility was transferred from the USAMUCOM Operations Research Group to the USARMCOM Management Information System Directorate. Detailed program descriptions, including program listings and flow diagrams, are available in the APBA System Programmer's Manual.⁵ A brief description of each of the programs, their functions and input, is provided in paras 22 through 34 following.

22. The Component Requirements Program (PBAREQ). The PBAREQ program calculates the number of components necessary to satisfy specified end-item mobilization and/or hot-base (current production) requirements. The PBAREQ program input consists of a data tape and a set of data cards for end items assigned new mobilization or hot-base requirements. If a new requirement card for an end item is not included in the new end-item requirement card deck, the PBAREQ program calculates component requirements for that end item based on the requirements stored on the input data tape. Component requirements are calculated by multiplying the end-item requirement times the procurement factor for each component in the end item. Total component requirements are derived as a sum of the demands for that component by all end items. Both hot- and cold-base component requirements are determined. The PBAREQ program allocates the hot-base requirements to specific facilities based on the item hot-base requirements and the facility priority of retention. The PBAREQ program output consists of a data tape that includes the new requirements, a

⁵Loc. Cit.

TABLE 1. Summary of APBA System Programs

Program name	Operation	Computer time execution (min)	Print (min)
PBAREQ	Determines Critical component requirements Provides a "difference summary"	120	40
PBACOR	Corrects data using tape position	40	15
PBAVER	Verifies entry of data on tape	75	20
UPDAT	Updates, sorts and validates tape data	180	60
PBACOM	Creates end item and component footnotes Provides an end item/component breakdown	300	60
PBAPBS	Develops the planned production schedules Provides a production base analysis on tape	240	40
PBAPNT	Prints the production base analysis from tape	15	210
PBASLC	Extracts production data for selected end items Provides a miniature master data file on tape	60	20

listing of the tape, and a requirements difference summary. The difference summary lists the old and new level 2 are mobilization requirements, the old and new hot-base requirements, the differences for both, existing production assignments, and also lists all components required for a given end item, and all end items utilizing a given component. (A sample difference summary is attached at Appendix D.) If facility production assignments or capabilities must be revised in light of the new requirements, the UPDAT program or the PBACOR program is used to correct the data.

23. The Data Correction Program (PBACOR). The PBACOR program is utilized to revise a data tape in order to update item or facility data and correct data errors on the input tape. The PBACOR program input consists of a data tape and a PBACOR data deck containing two types of cards: program instruction cards and item and/or facility data cards. Each instruction card uses the location of a data card listed on the tape as a reference point for the addition or deletion of a specified number of data cards. The revision of a data tape is directed by the PBACOR program as follows:

24. The card images on an input data tape are read and stored until the tape position specified on the first instruction card is reached. If the instruction card directs the deletion of "n" data cards, that number of card images on the tape are skipped. (These are not stored for future retrieval by the program.) If the instruction card directs the addition of "x" data cards, that number of cards follow the instruction card. The data cards are then read and stored (for future retrieval) by the program. The instruction card also permits a combination of these two operations in order to update data already on the tape, i.e. the obsolete cards are skipped and new data cards are added in their place. Upon completion of the operation(s) directed by the first instruction card, the PBACOR program then continues to read and store card images from the tape until the tape position specified on the next instruction card is reached. This operation is then repeated until all revisions are completed and all data on the tape are read. The data stored by the program is then retrieved and written on a new data tape.

25. The PBACOR program output consists of a revised data tape, a listing of the tape, and a summary of the revisions performed. The revised tape is then verified by the PBAVER program for correctness and completeness.

26. The Data Tape Verification Program (PBAVER). The PBAVER program is utilized to identify incorrect or improperly sequenced data cards on an input data tape or in a deck of cards used as input to an APBA system program. An instruction card employed with the PBAVER program specifies the type of input to be verified. The PBAVER program output is a listing of the data deck or data tape input and/or a listing of the cards found in error. Another instruction card permits a choice of listing the input data as well as the errors or limiting the output to a listing of

the data errors only. Data errors detected by the PBAVER program in a card deck are corrected manually while data errors on an input tape are corrected using the UPDAT program or the PBACOR program. The PBAVER program is scheduled after each APBA program that utilizes manually prepared input data, to preclude subsequent program termination due to data errors on the master data file.

27. The Master Data-File-Updating Program (UPDAT). The UPDAT program was developed after the PBACOR program in order to reduce the time and effort spent by the data specialist in revising the master data file. The UPDAT program accomplishes this by freeing the user from the necessity of specifying the exact location of the data stored on the master file. Instead, the UPDAT program utilizes the card type, an item schedule number and a facility plant index number as the means by which a single card is located in the file. If new data cards or data sets are to be added to the file, or, if data cards or data sets already stored in the file are to be revised, the UPDAT program requires only the addition of the new or revised cards; no instruction cards are necessary. Only if selected single data cards or complete data sets are to be removed from the file, without replacement, are instruction cards necessary. (A detailed discussion of the UPDAT program input requirements is contained in the UPDAT Program User's Guide.⁶) Hence, the preparation of a deck of data card revisions for the UPDAT program is simpler and more timely than the preparation of a corresponding deck of revisions for the PBACOR program. Additionally, the UPDAT program incorporates all of the features of the PBAMOV program and some of the PBAVER functions in its operation. That is, the UPDAT program automatically sorts the input data so that the output data are in the required array, the program detects selected input data errors during the same operation, and finally provides various error messages on the printed output that alert the user to the input data problems.

28. The primary drawback to utilization of the UPDAT program is the excessive computer time required. The UPDAT program requires over three times as much execution time as the PBACOR program for a data file of the same size. Consequently, the UPDAT program is primarily utilized to revise the data tape after the allocation process, when the sheer volume of data makes input data errors probable. The PBACOR program, on the other hand, is used to correct a small number of errors (less than 100) found in the data file, after examination of the file by either the data specialist or the PBAVER program. The input to the UPDAT program consists of a validated data tape (usually the PBAREQ output tape) and a validated deck of data cards, including such instruction cards as required. The UPDAT output consists of a new data tape, a printout of the new data tape (master file), and any error messages that are forthcoming as a result of input data problems. As the UPDAT program is used to incorporate data

⁶Loc. Cit.

revisions that establish a new production base, the UPDAT output tape is used as the input to the PBACOM or PBAPBS program.

29. The Critical-Component Footnote Program (PBACOM). The PBACOM program automatically formulates and incorporates selected end-item and component footnotes into the master data file tape and provides an end-item/component-breakdown printout similar to that prepared by the ARMCOM Production and Procurement Directorate.⁷ Both types of footnotes are derived from the critical-component (E-series) data cards included in each item data set. The footnotes are incorporated into the data sets as footnote (N1) cards so that the information appears in the remarks section of the appropriate final-item analysis. The end-item footnotes furnish a list of the critical components used to produce each end item; the component footnotes provide a list of all the end items requiring a given component. Both footnotes provide the data specialist with the cross-reference data necessary to verify the composition of each end item as well as the component requirements derived therefrom. The end-item/component-breakdown printout permits verification of the critical-component breakdown for each end item in the master file without the necessity of referring to the classified tape listing. The input to the PBACOM program is a validated APBA data tape. The PBACOM output is specified, on program option cards, by the data specialist, e.g., footnotes and printouts, footnotes only, printout only, etc. The usual output consists of a new data tape (with end item and component footnotes incorporated), a listing of the new data tape and an end item/component-breakdown printout. The output tape is then used as input to the PBAPBS program to develop the Production Base Analysis. Since the PBACOM program requires a great deal of computer time, it is normally run only when a master data tape is initially created or after extensive changes in component breakdown. At other times the required footnote cards are inserted by the PBACOR or the UPDAT programs.

30. The Production-Base-Scheduling Program (PBAPBS). A key element in the APBA system is the PBAPBS program. This program performs production scheduling and assignment operations that culminate in the formulation of a final-data output tape. This tape is then utilized by the PBAPNT program to print the final item and facility analyses and a D-P inventory-requirement summary. The PBAPBS output tape employs a format that is distinctly different from that utilized by any of the preceding programs. Hence, if the PBAPBS output tape is inadvertently used as input to any of these programs, the programs will not operate. A summary of the PBAPBS program operation is as follows:

31. A production goal is established for each facility assigned to produce an item. This production goal is based on the item production

⁷End Item and Component Master File, AMSMU-PP-PDIM, US Army Munitions Command, 30 August 1971, UNCLASSIFIED Report.

requirement and the facility priority of retention. A tentative production schedule is then developed for each facility, from a hot- and/or cold-production base, as applicable. This tentative production schedule is derived from the assigned production goal (total requirement for the item) and standard production-acceleration curves contained in the PBAPBS program or special acceleration curves inserted in the input data by the user. A final production schedule is determined by adjustment of the tentative schedule to reflect limitations of the planned production due to the nonavailability of components or the inadequacy of the end-item LAP operation. A list of the facility product assignments and the planned utilization of each facility for each product is then compiled from data extracted from the final production schedule. Finally, the monthly production requirements and the planned production of each item are compared to calculate the D-P production deficit and determine the D-P inventory requirement. Once these operations are completed, the results are written on an output tape that is used by the PBAPNT program to print the output.

32. The APBA Print Program (PBAPNT). The PBAPNT program prints a production base analysis on computer paper, using the output tape from the PBAPBS program. This printout consists of a series of item and facility analysis forms and a summary of D-P inventory requirements. The item and facility analysis forms provided by the PBAPNT program utilize the same basic format as AMC Forms 1446 and 1447. However, 2 to 8 computer pages are necessary to represent each item or facility, depending on the number of facility assignments and remarks. The D-P inventory-requirement summary lists the production requirements, the planned production, and the resultant production deficit for each item on a monthly basis and over the entire D-P period. The D-P inventory summary prints the data for three items on each computer page. The entire production base analysis consists of approximately 3000 linked computer pages.

33. An additional printout, termed the "debug" output, is also supplied by the PBAPNT program if the appropriate option was used in the PBAPBS program. This debug output contains detailed information on each operation performed by the PBAPBS program. It is used to verify PBAPBS program operations and as a source of information that is not printed on the item analysis forms, e.g., hot-base production data for cold facility. The volume of the debug output is approximately one and one-half times the volume of the corresponding production base analysis output; however, this output is generally written on tape, and only the data needed are printed on hard copy.

34. The Mini-Master File Selection Program (PBASLC). The PBASLC program is utilized to develop a production base analysis for a selected group of items rather than all of the items listed on the master data file, e.g., 105-mm munitions only, 2.75-inch rockets only, etc. The program extracts from the master data file all critical component and facility production data pertinent to industrial preparedness planning for those end items selected by the data specialist and creates a miniature

version of the master data file. This "mini-file" is similar in all respects to the complete master data file but contains only the data necessary to develop a PBA for the end items selected. Consequently, the data relevant to each of the critical components used to manufacture the selected end items, as well as the production facilities assigned to produce both the end items and components, are included in the new mini-file. A production base analysis is then developed from the mini-file using the same APBA system procedures as outlined for the complete master file. However, the computer time and manual effort required is much less, as the size of the data file has been greatly reduced. (A mini-file is generally one-tenth to one-twentieth the size of the complete master data file.) The input to the PBASLC program is validated APBA data tape and a set of data cards listing the end items selected. The PBASLC output consists of a new data tape (the mini-file), a listing of the new data tape, and an index containing each end item, component, and production facility selected by the program. The production base analysis developed from the mini-file is then used to evaluate various production base plans for the selected items that result from changes in the requirements guidance, modernization policy, or composition and activity of the original production base.

PREPARATION OF THE APBA SYSTEM INPUT

ESSENTIAL INPUT ELEMENTS.

35. The APBA system input data tape contains basically the same input elements as required to produce the base retention study manually. These input elements, which are listed below, consist of descriptive and quantitative data for each item and facility considered in the mobilization production analysis.

36. Those data elements that are essential to the operation of the APBA system are annotated in the list below with an asterisk (*). Failure to include these elements in the input data tape will preclude proper operation of the APBA system programs.

37. Facility Data Elements.

*a. Plant Index Number: Utilize the plant index number assigned in the latest listing of the DOD register of Planned Emergency Procedures (DOD-RPEP).⁸ If the Facility is not listed in the Register, assign a number that is not in conflict with the plant index numbers given in the Register.

b. Facility Name and Address: Obtain the complete name and address

⁸Defense Supply Agency, Register of Planned Emergency Producers (RPEP); DOD 4005.3-11, 1 April 1971; UNCLASSIFIED

of each facility from the DOD-RPEP or DD Form 1519. This data is then arranged into four lines of up to thirty-five characters each beginning with the facility name on the first line. If there is an assigned PEP number, it will be included as the last portion of the fourth line of the facility name and address. PEP numbers are listed in the SP33 and SP34 publications of the Defense Industrial Plant Equipment Center (DIPEC).⁹

c. Geographical Coordinates: Secure the facility location (zone, east and north coordinates) and identify the type of structure (PVN code) at the facility from the applicable DD Form 1519.

d. Production Equipment and Facility Layaway Data: The Government-owned equipment integral to each planned producer to provided in SP33 or SP34 as published periodically by DIPEC. Equipment data will include ASOD number, type, location, number of pieces of equipment, replacement value, and annual maintenance cost, if available.

e. Facility Remarks: Include additional information, as applicable, such as costs to complete deficits at existing producers, estimated costs to provide M-day action facilities, conversion costs, etc.

38. Item Data Elements.

*a. End-Item or Component Schedule Number: Utilize the schedule number assigned in the latest ARMCOM End-Item and Component Master File.¹⁰ Only those components assigned the prefix digit "1" (designating metal part), "5" (indicating propellants or explosives), or "8" (denoting a component LAP operation) are considered in ARMCOM mobilization planning and require extraction from the master file, as detailed in para 39.

*b. End-Item or Component Nomenclature: Use the end-item or component nomenclature given in the ARMCOM End-Item and Component Master File. Include applicable item identification, such as model number or drawing number. (End-item nomenclature also includes specification of the Department of Defense Ammunition Code (DODAC) and the Department of the Army Standard Study Number (SSN).

c. Modernization (MOD) Code: Specify the type classification of the item by MUCOM Research and Development Directorate as follows: Standard (STD), Limited Production (LP), Modernized (MOD), or Developmental (DEV).

⁹Army Industrial Plant Equipment Inventory - ASOD Items (DIPECSP33); Defense Supply Agency, 31 May 1972; UNCLASSIFIED.

¹⁰End Item and Component Master File; AMSMU-PP-PDIM, US Army Munitions Command, Ammunition Procurement & Supply Agency, 30 August 1971; UNCLASSIFIED.

d. Responsible Activity: Designate the ARMCOM activity responsible for readiness planning of the item, e.g., Harry Diamond Laboratory (HDL), ARMCOM Headquarters (ARMC), Picatinny Arsenal (PA), Edgewood Arsenal (EA) or Frankford Arsenal (FA).

*e. Administrative and Production Leadtime: The administrative leadtime is assumed negligible at the time of mobilization. The production leadtime, obtained from DD Form 1519, is the elapsed time required by a given facility in order to produce one item, assuming startup from a cold base and all other necessary materiel is available at M-day.

*f. Unit of Measure: Utilize an alphabetic character to represent quantitative units, as follows: "E" for units of each, "T" for tens of units, "H" for hundreds of units, "K" for thousands of units, and "M" for millions of units. Although the program can handle all five of these units of measure, ordinarily only E, K, or M are used.

g. Planned User Requirements: The user specifies the month-by-month combat and training utilization of the items for months M+1 through M+6. It is assumed that requirements will level off at the M+6 level.

*h. Planned Monthly Requirements Levels: Utilize the Department of the Army, Data Processing Center, "President's Budget File",¹¹ to ascertain the end-item requirements levels (Budget, Planned Modernization, Permissive Modernization, NATO, and Retention) for the US Army and Selected Allies at mobilization. The remaining services (Navy, AF, and USMC) provide the respective requirements to ARMCOM P & P Directorate, Production Division. Component requirement levels are derived from the end-item requirements levels during operation of the APBA system. Current production requirements (planned budget buy quantities) are utilized as available.

*i. Facility Priority of Retention: The user specifies the facility priority of retention, i.e., first, second, etc., for each item included in production planning, after examination of the applicable DD Forms 1519. Up to 18 facilities may be specified for a given item.

j. DD Form 1519 Expiration Date: The expiration date for the industrial preparedness planning data applicable to each item is extracted from the DD Form 1519 submitted for each assigned production facility.

k. Armed Service Procurement Planning Office (ASPPO) Code: Determine the ASPPO code number from the facility listing of the DOD-RPEP.

¹¹Department of the Army DCSLOG DDPC, President's Budget File, August 1972, SECRET.

1. Business Classification: The classification of a business as "large" (L) or "small" (S) is made by the ARMCOM Production and Procurement Directorate.

*m. Planned Monthly Production Capabilities: Utilize the planned production capabilities listed on the DD Form 1519 for each producer as follows: Minimum Sustaining Rate (MSR), one-shift basis (1-8-5), two shift basis (2-8-5) and the maximum planned rate. If these planned capabilities correspond to all allocation of the total facility capability to production of various other items, then each item remarks section should include a statement of the production rate(s) possible if only that item were produced by the facility.

*n. Production Limitation Factor (Pacer): The planned production of an end item is limited by the availability of its constituent parts or by the end item load, assemble, and pack (LAP) operation during the period M+1 through M+23. The functional area consultant (AMSAR-PPW) will specify that component or operation which most limits the production of each item during this planning period, i.e., the "pacer" for each end item. (This information was obtained from the manufacturer's data on SMUAP Form 1220, provided by the ARMCOM P&P Directorate.)

*o. Component Procurement Factor: The user will list, by schedule number, each component, with its respective procurement factor, that is essential for the production of each end item included in mobilization planning. These data are secured from the latest ARMCOM END-ITEM and Component Master File.

p. Item Remarks: Include additional information with each item, as applicable, such as identification of a substitute item, components supplied by other services, etc.

39. Utilization of Component-Breakdown Data Elements. The component-breakdown data elements listed in para 38 under subparagraphs a, b, and n are secured from the ARMCOM End-Item and Component Master File. This file provides a breakdown of each end item considered in mobilization planning and lists the schedule number, procurement factor, and nomenclature of each component utilized in the production of an end item. However, not all components listed in this file are "base components", that is, all listed components are not included in the production base analysis. A listed component is not included in the production base analysis if it is commonly used or produced by private industry so that any quantity of the item is readily available from industry at mobilization without the necessity of production planning or contract arrangements. Examples of nonbase components are cloth (for bandoliers), ethyl alcohol, and ammonium nitrate. Base components, on the other hand, are included in the production base analysis as these items are not readily procured from industry in the quantity required at mobilization. Inclusion of an item requires the assignment of a specific production facility or a particular production equipment package, whether Government-owned and operated or contractor-owned and operated, to each component in

order to insure the availability of that component at mobilization. Examples of base components are 155-mm HE shell casings, Composition B, and artillery fuzes. These base components are subdivided into three categories to facilitate analysis of the production base: metal parts, propellants and explosives, and component LAP (loaded components). Each base component is assigned a five-digit schedule number with the first digit of the schedule number indicating the component category. The digit "1" indicates a metal part; the digit "5" indicates a propellant or explosive; the digit "8" indicates a loaded component (one that requires an intermediate LAP operation). The metal parts category includes the basic hardware of a munition, such as cartridge cases, fuze bodies, shell casings, jacketed bullets, etc. The propellant and explosive category includes chemical and pyrotechnic fillers as well as standard propellants or explosives. Additionally, if the production of a propellant or explosive requires a certain chemical and that chemical is not readily available from industry, the chemical itself is then treated as a base component. Hence, the propellant and explosive category includes such items as solventless rocket propellant, Composition A-5, chemical agent CS, and dinitrotoluene (DNT). The component LAP category includes each component that requires an intermediate operation to complete the component, such as detonators, primers, fuzes, and propelling charges. Two of these component categories include multipart components, i.e., components that utilize other components in their production. These are propellants or explosives that require selected chemicals treated as base items and loaded components that utilize base metal parts and propellants or explosives in their manufacture. Each multipart component, if considered separately, requires a component breakdown in the same manner as an end item. Two procedures are utilized in listing component breakdown data in the APBA system. The first method is to list a complete component breakdown, including the components used in multipart components, with the data on each end item. The second procedure is to list the major (multipart) component data with each end item and then list a component breakdown with the data on each multipart component. An example of each of the procedures, using the 2.75-inch HE rocket is given in Table 2. The first method, a complete breakdown with the end item, is recommended to the user as less confusing initially and ultimately more accurate, since errors in component requirements can be traced back to the appropriate end item.

BASIC TYPES OF DATA CARDS.

40. The APBA input tape consists of an array of ten different types of data cards, each of which is identified by a letter (F, B, A, G, R, C, U, N, E, or D) recorded in card column 1. Each type is used to store selected descriptive or quantitative item or facility production data, or to transmit instruction to the APBA system programs. Each card contains a reference to an end item or component by a schedule number, planned production facility by plant index number, or includes both numbers in order to facilitate data recovery during execution of the system programs. Each card is further subdivided, depending upon the quantity or type of data stored, by the insertion of a number (0-9) in

TABLE 2

TWO METHODS FOR BREAKDOWN OF COMPONENT DATA

Item Data Set in Which Entry is Made	Component Schedule No.	Component Nomenclature	Procurement Factor
2.75 inch M151 HE Rocket with M427 Fuze	Method One: Complete Breakdown Under End Item		
	14597	Fin and Nozzle Assy F/Motor Rocket MK40	1.030000 each
	15310	Fuze Rocket M427 (MPTS)	1.030000 each
	16743	Motor Tube F/Rocket 2.75 inch	1.020000 each
	17830	Warhead HE M151 2.75 inch	1.000000 each
	52735	Composition B	2.330000 lbs.
	54331	Dimethylaniline (DMA)	0.010460 lbs.
	56324	Lead Azide (dextrinated)	0.000311 lbs.
	56325	Lead Azide (RD 1333)	0.000166 lbs.
	57360	Propellant Solventless Rocket N5	6.500000 lbs.
	57525	RDX	1.398000 lbs.
	57615	Rocket Grain MK43	1.000000 lbs.
	59350	Tetryl	0.022020 lbs.
	59465	Trinitrotoluene (TNT)	0.732000 lbs.
	85310	Fuze Rocket M427 (Component LAP)	1.020000 each
	87243	Primer M104 (Component LAP)	1.040000 each
2.75 inch M151 HE Rocket w/M427 Fuze	Method Two: Breakdown Under Various Components		
	19830	Warhead 2.75 inch HE M151	1.000000 each
	85310	Fuze Rocket M427 (Component LAP)	1.020000 each
	88670	Motor Rocket 2.75 inch MK40	1.000000 each

TABLE 2

TWO METHODS FOR BREAKDOWN OF COMPONENT DATA (Cont'd)

Item Data Set in Which Entry is Made	Component Schedule No.	Component Nomenclature	Procurement Factor
Item 19830 Warhead 2.75 inch HE M151	52735	Composition B	2.330000 lbs.
	56325	Lead Azide (RD 1333)	0.000166 lbs.
Item 85310 Fuze Rocket M427 (Component LAP)	15310	Fuze Rocket M427 (MPTS)	1.009804 each
	56324	Lead Azide (dextrinated)	0.000305 lbs.
	59350	Tetryl	0.021588 lbs.
	87243	Primer M104 (Component LAP)	1.019706 each
Item 88670 Motor Rocket 2.75 inch MK40	14597	Fin and Nozzle Assy F/Motor Rocket MK40	1.030000 each
	16743	Motor Tube F/Rocket 2.75 inch	1.020000 each
	57360	Propellant Solventless Rocket N5	6.500000 lbs.
	57605	Rocket Grain MK43	1.000000 lbs.
Item 52735 Composition B	59465	Trinitrotoluene	0.400000 lbs.
	57525	RDX	0.600000 lbs.
Item 59350	54331	Dimethylaniline	0.475000 lbs.

NOTE: The multiple breakdown procedure results in component breakdown data through successive stages until only single-part components are obtained. The Procurement factor listed in the breakdown of each multipart component refers to the number of components (or subcomponents) required to produce exactly one basic item (the end item or multipart component to which the breakdown applies). Thus, the procurement factor for TNT of .932000, using a complete breakdown of the end item, is equivalent to the multiple breakdown of Comp B (2.330000) in the warhead and the percentage of TNT in that Comp B (40% or .400000) since $(2.33) \times (.4) = (.932)$. Similarly, the DMA requirement in the complete end-item breakdown (.010460) is obtained from the tetryl requirement in the fuze (.022020) and the percentage of DMA in tetryl (47.5%), i.e., $(.02202) \times (.475) = (.010460)$.

card column 2 in addition to the letter in card column 1.

41. The ten basic types of data cards are described below; the individual card formats for each basic type, including subdivisions, are detailed in Appendixes A and B of the manual.

42. Descriptive and Quantitative Data-Storage Cards.

a. "F" Card (Type 1): The F1 and F2 data cards store the facility name, address, and ASOD package number, if applicable. (Section I of AMC Form 1447).

b. "B" Cards (Type 2): The B3 data card contains the geographical coordinates, PVN code designation, production equipment, and facility layaway data, including cost data. (Sections I and II of AMC Form 1447).

c. "N" Cards (Type 3): The N1 Card contains the footnote or remarks data for end items and components (Section V of AMC Form 1446); the N2 contains footnote or remarks data for planned production facilities (Section IV of AMC Form 1447).

d. "A" Cards (Type 4): The A1 card is used to store end-item or component nomenclature, the MOD code, and the responsible activity; the A2 card is used for additional item nomenclature, if necessary. (Section I of AMC Form 1446).

e. "R" Cards (Type 5): A set of six "R" cards, R1-R6, are used to store the planned monthly mobilization requirements, current production requirements, DODAC, SSN, and unit of measure, as applicable. (Section II of AMC Form 1446).

f. "C" Card (Type 6): The C1 card details the facility production assignment to a given item, facility priority of retention, production capabilities (MSR, 1-8-5, 2-8-5, and MAX), DD Form 1519 dates, ASPPO code, business classification, unit of measure, production lead-time. (Section III of AMC Form 1446).

g. "E" Cards (Type 7): E1-E5 cards contain end-item breakdown data (type of components and procurement factor), identify the item pacer, and designate selected components for which special procedures are required. (ARMCOM End-Item and Component Master File and SMUAP Form 1220).

43. Program Instruction Data Cards. Three of the ten basic types are employed to transmit selected instructions to APBA programs as well as to store production data. Two of these cards transmit instructions to override standard operations performed by the PBAPBS program while the third transmits a signal to each APBA program at the end of each discrete set of data (end item or component) on the data tape.

a. "G" Cards (Type 8): G1 and G2 cards are used to assign a nonstandard production goal to a facility, that is, assign a planned production rate that is less than the facility maximum capability. These cards are employed by the user to plan utilization of two or more facilities where the first facility alone could actually satisfy the planned production requirements.

b. "U" Cards (Type 9): U cards are utilized to specify a particular production-rate acceleration curve, or production buildup, for an individual production facility. Such a facility is generally composed of a series of production lines or areas that achieve the same production rate but are activated sequentially or in pairs. Hence, the standard production acceleration tables, attached at Appendix B, are not applicable. The U cards are used to represent these nonstandard production rates as well as other production facility peculiarities such as "double buildup" a temporarily used facility (produces after M-day but not on P-day), and "dummy facilities" for special items or cases.

c. "D" Cards (Type 10): The D1 card is used with each set of standard end-item and component data so as to mark the end of the data applicable to one item. Four other data cards described above (B3, N2, E1, and E5) may be modified to perform a similar function for other sets of data, namely facility data and nonstandard end-item or component data.

ITEM AND FACILITY DATA SETS.

44. The APBA input tape contains a series of data card sets that represent each item and facility included in mobilization planning. The user assembles these data sets from the various types of data cards described in paras 40 through 43 and detailed in Appendixes A and B of this manual. The number and type of data cards in each set is dependent upon the quantity of data that is stored and the nature of the item or facility that is represented. Each data set contains the quantitative and descriptive data, and the instruction necessary to perform an analysis of the respective item or facility.

45. There are three general types of data sets used in the APBA system: facility data sets, standard-item data sets, and nonstandard-item data sets. The assembly of each is detailed in paras 46 through 48 below respectively. The data cards that are requisite to each data set are marked with an asterisk (*). Failure to include these cards in the respective data set will result in APBA program termination. Optional data cards for each set are listed without an asterisk and may be omitted without affecting program operation.

46. Facility Data Sets.

a. Facility Production Equipment Data Set. Three data cards are utilized to assemble a data set that identifies a facility with its Government-owned production equipment. One of these data sets is required for each producer considered in the mobilization production base

analysis. Facilities so represented by data sets include existing facilities, X-facilities, M-day action facilities, and "dummy" facilities. (The latter is a special facility, required in the APBA system, used for special cases, e.g., "Department of the Navy LAP facility", "Bulk Issue (external requirements) P&E facility", etc.) Each data set consists, in order of succession, of the following cards:

<u>Card type:</u>	<u>Card content</u>
*F1	Facility name and address (lines 1 and 2)
*F2	Facility name and address (lines 3 and 4)
*F3	Production equipment facility layaway data

b. Facility Remarks Data Set. The facility remarks data set consists of a series of footnote (N2) cards that contain the remarks pertinent to one facility. If there are no applicable remarks for a facility, no footnote cards (or facility remarks data cards) are required. Each N2 card includes sufficient information to constitute one-half of a footnote line as printed in the final APBA system output. That is, each N2 card stores 56 characters while each final footnote line includes 112 printed characters. Hence, two N2 cards are utilized for each line of facility remarks, and the number of lines is dependent upon the length of the footnote. A typical facility remarks data set, if one is required, consists of the following cards:

<u>Card type:</u>	<u>Card content</u>
N2	Remark #1 (first half-left side of line 1)
N2	Continuation of remark #1 (second half-right side of line 1)
N2	Continuation of remark #1 (first half-left side of line 2)
N2	Remark #2 (first half-left side of line 3)

47. Standard Item Data Sets. A majority of the item data sets that are listed in an APBA data tape are standard end-item or component data sets. Each data set contains the following information pertinent to each item: nomenclature, descriptive data, mobilization and hot-base (budget) requirement levels, assigned facilities and the corresponding capabilities special production goal or buildup data, component breakdown data (end items), and remarks data. At least ten data cards are utilized to store this data in each set, with the last data card marking the end of each data set. One item data set, standard or nonstandard (see section 48), is required for each end item or component included in the mobilization production base analysis. If an end-item data set is missing, no requirements for components of that end item are derived.

If a component data set is missing and the component is listed as part of an end item, the component requirements are derived but there is no place to store them in the master data file. Data sets that are incorrectly assembled may preclude operation of the APBA system programs altogether. Thus, special care must be exercised in assembling a standard end item or component data set. The required array consists of the following cards:

TABLE 3. CARDS FOR STANDARD END-ITEM DATA SET

Card type	Card content
*A1	End-item or component nomenclature and description
A2	Additional nomenclature (as applicable)
*R1	Month by month buildup of requirements for M+1 to M+6 (see Appendix A)
*R2	US Army mobilization requirements
*R3	USMC mobilization requirements
*R4	NAVY mobilization requirements
*R5	USAF mobilization requirements
*R6	Selected Allies mobilization requirements/Hot Base (current production requirements)
C1	First assigned facility - production capability data
C1	Second assigned facility - production capability data
U	Nonstandard production data applicable to second facility, as required
*C1	Last assigned facility - production capability data
*N1	Item remarks: first entry (as applicable)
N1	Item remarks: last entry (as applicable)
E3	Component breakdown data: padding component (end item)
E2	Component breakdown data: first nonspacing component (end item)**
E2	Component breakdown data: second nonspacing component (end item)

TABLE 3. CARDS FOR STANDARD END-ITEM DATA SET (Cont'd)

Card type	Card content
E2	Component breakdown data: last nonpacing component (end item)
D1†	Data card used to mark the end of a data set.

*Inclusion of this card type is mandatory for proper data file preparation.

**Once the pacing component has been determined in an end item, all other components in that end item are considered as nonpacing components, since the APBA system considers only one pacer for each end item.

†A D1 card is always used to mark the end of a standard end item or component data set. However, nonstandard data sets may end with an "E1" or "E5" card. See subsection 4 of paragraph 48.

NOTE: An E3 card used in an end-item data set indicates that the availability of a component is less than the end-item LAP capability sometime during M+1 and M+23. If the end-item LAP operation is, in fact, the limiting factor for end item production, an E3 card is not used and all components are included on E2 cards. Hence, no E-type cards are required in the data set of an end item that has no components and is limited in production by the end-item LAP operation.

48. Nonstandard-Item Data Sets. Nonstandard item data sets are included in the APBA data tape so that two special types of end items and two special component categories are considered. These special data sets represent bulk issue items, separate issue artillery or grenade fuzes, pacing components and prime items. Each type of nonstandard item-data set is described in subparagraphs a to d below.

a. Bulk-Issue Item Data Set. In the APBA system, a requirement for a component is determined only in those instances where a requirement exists for an end item and the end-item breakdown identifies the component and its respective procurement factor. Hence, if an end-item data set that requires a particular component is missing or if a component is not included in the component breakdown data of an end item, a zero demand would be calculated as the requirement for that component. There are several components, however, for which ARMCOM is assigned production planning responsibility but to which another service is assigned the end-item LAP responsibility. These are the bulk explosives and propellants supplied by ARMCOM to Department of the Navy. The inclusion of these component requirements in the APBA data tape requires the formulation of a bulk-issue "end item" data set. This data set lists the component requirements as "end item" requirements, assigns a "dummy" facility to produce the bulk-issue "end item", and specifies one pound of the appropriate propellant or explosive as necessary to

produce each bulk-issue "end item." In this manner, component requirements that are not derived from the end items for which ARMCOM has responsibility are included in the final production base analysis. In some cases two or more component breakdown (E-type) cards may be necessary as the bulk-issue "end item" represents a component composed of two or more parts. For example, a requirement of 100 pounds of Composition B represents a 100-pound requirement of the component "Comp B" and a 40-pound requirement of the component "TNT". (Information of this type must be supplied by the user since the bulk-issue "end item" data set will not provide the desired component requirements data.) A minimum of twelve data cards is required to assemble a bulk-issue "end item" data set, as follows:

TABLE 4. BULK-ISSUE END-ITEM DATA SET CARDS

Card type	Card content
**A1	Nomenclature and description of the bulk-issue item
A2	Additional nomenclature (as applicable)
*R1+	Requirement buildup
*R2	Bulk-issue requirements (Army)
*R3	Bulk-issue requirements (USMC)
*R4	Bulk-issue requirements (Navy)
*R5	Bulk-issue requirements (USAF)
*R6	Bulk-issue requirements (selected allies)
*C1	Production capability data ("phantom" facility)
*U	Nonstandard Production override (production equals requirements for all periods from M+1 through M+24)
*N1	Bulk-issue item remarks or remarks filler
*E2	Component breakdown; identification and procurement factor
E2	Component breakdown; identification of subcomponent (as applicable)
*D1	Data set card marker

*Inclusion of this card type is mandatory for proper data file preparation. While the R1 card is required for program operation, no data need to be entered. If data are missing, the program will operate normally, but the D to P listing will be distorted.

b. Separate-Issue-Fuze Data Set. The terminology "separate issue fuze" is applied to an artillery or grenade fuze that is produced for utilization by another end item as a component and for issue as a separate end item. Component fuze requirements are based on requirements for those end items that utilize the fuze in the final LAP operation. Requirements for fuzes issued only as end items are derived using the bulk issue end-item data set previously described. Separate-issue fuze requirements, however, are the sum of these component and end-item fuze requirements as the separate-issue fuze combine characteristics of both. Since the number of fuzes produced prior to P-day is usually insufficient to meet the aggregate demand, separate issue fuzes are first allocated to the end-item LAP facilities that utilize the fuze as a component while any remaining fuzes are scheduled for issue separately as end items. This procedure precludes a reduction in planned LAP capabilities, which might occur if the fuzes were allocated equally for end-item LAP and separate issue. The inclusion of a separate issue fuze in the APBA data tape requires the assembly of two data sets for each fuze. The first, a separate-issue fuze-identification data set, identifies the item as a separate issue fuze and contains the separate issue requirements. This data set is quite similar to the bulk issue end item data set. The second, a separate issue fuze schedule data set, establishes a fuze allocation schedule such that no fuzes are issued as end items until all fuze requirements for end-item LAP operations are satisfied. Only the first data set appears in the final APBA output, but the second set is required for internal APBA program operations. The array for each data set is listed in Table 5.

c. Pacer (Limiting-Component) Data Set. The production of an end item is generally limited by the planned capability to load, assemble, and pack (LAP) the components required to produce each end item. However, an end-item production rate that is equivalent to the planned LAP capability assumes that all components are available in the necessary quantities during the M-day through P-day period. In some instances, this end-item production rate is less than the LAP capability, as the quantity of a particular component available for LAP is less than the quantity necessary to achieve the planned LAP capability. This limitation to an end item LAP operation occurs only prior to M+24, since the planned goal at M+24 is to produce all components in quantities sufficient to satisfy all LAP requirements and to produce all end items at a rate equal to the planned mobilization consumption rate of each item. Components that limit the planned end item LAP capabilities are termed "limiting components" or "pacers," and require the formulation of a special component data set, which is stored at a different location on the master file than is a standard component data set. Different end items may utilize the same pacer, that is, the availability of the same component may restrict the production of several end items. However, only one component is designated as a pacer for each end item, due to the original APBA system logic.* Hence, the functional area user must determine which component most restricts the planned end-item production prior to M+24. Once specified, the availability of each pacer is utilized to determine the reduction in capability for the LAP of each end item.

*Planning is presently in progress to develop a program that will allow any component to pace (limit) the production of an end item on a monthly basis.

TABLE 5. SEPARATE ISSUE FUZE DATA SETS

CARD TYPE FOR INDICATED DATA SET		CARD CONTENT
IDENTIFICATION (Deck 6)	SCHEDULING (Deck 8)	
*A1	*A1	Nomenclature and description
A2	A2	Additional line of nomenclature (optional)
*R1	*R1	Monthly requirements buildup
*R2	*R2	Army requirements
*R3	*R3	Marine Corps requirements
*R4	*R4	Navy requirements
*R5	*R5	Air Force requirements
*R6	*R6	Requirements for selected allies
*C1	*C1	Production capability data ("phantom" facility)
U	U	Nonstandard production buildup (optional)
*N1	*N1	Footnotes for item analysis (Form 1446)
*E5		Cross-reference to principle metal part of fuze (prime item)**
	*E3	Cross-reference to stored availability of separate issue fuze
	*D1	Data set end marker

*Inclusion of this card type is mandatory for proper data file preparation.

**The data set for the prime item must be loaded in deck 7 in order to be located between the identification (deck 6) and the scheduling (deck 8) data sets.

If only one end item utilizes a particular pacer, then all planned production of that pacer is allocated to the end item. If more than one end item contains the same pacer, the availability of that pacer is distributed to each end item using a prorate system based on the end-item mobilization requirements. Once the pacer availability for each end item is determined, all other components in that end item are assumed available in the quantities required by the restricted end-item LAP capability. Thus, the designation of a pacer can be checked by examining the availability of the remaining components. If another component shows less availability than the specified pacer, then that component will be designated as the pacer and the system rerun. A minimum of ten data cards are used to assemble a pacer data set, as listed in the array below.

TABLE 6. PACER (LIMITING-COMPONENT) DATA SET

Card type	Card content
*A1	Pacer nomenclature and description
A2	Additional Nomenclature (as applicable)
*R1	Monthly requirements buildup
*R2	Limiting component requirements (Army)
*R3	Limiting component requirements (Marine Corps)
*R4	Limiting component requirements (Navy)
*R5	Limiting component requirements (Air Force)
*R6	Limiting component requirements (selected Allies)
*C1	Production capability data (first planned facility)
C1	Production capability data (second planned facility, as applicable)
C1	Production capability data (last planned facility, as applicable)
*N1	Pacer remarks (first entry) or remarks filler card
N1	Pacer remarks (second entry, as applicable)

*Inclusion of this card type is mandatory for proper data file preparation.

TABLE 6. PACER (LIMITING-COMPONENT) DATA SET (Cont'd)

Card type	Card content
N1	Pacer remarks (last entry, as applicable)
*E1	Pacer-component data card** (also marks end of data set)

*Inclusion of this card type is mandatory for proper data file preparation.

**A pacer data set will include only one E-type data card; this is the E1 card which designates the component as a limiting factor in an end-item LAP operation; it also marks the end of the pacer data set.

d. Prime-Item Data Set.

The terminology "prime item" is applied to the principal metal part of a separate issue fuze, normally the body of the fuze. The prime-item data set is used to determine the monthly availability of the principal metal part (the pacer of each fuze) and project the monthly production of each separate issue fuze. This planned separate-issue-fuze production is then allocated by end-item LAP operations that require the fuze with the remainder of the fuze production allocated to separate issue as an end item. The prime-item data set also includes the component breakdown data for each separate issue fuze. (Component breakdown data is not included in either the separate-issue-fuze data set or in the separate-issue-fuze schedule data set; these data sets are only used to establish the separate-issue fuze requirements and schedule the special fuze allocations necessary.) In this component breakdown, the principal metal part (prime item) is listed as the pacer of the separate issue fuze and all other components (tetryl, primers, detonators, etc.) are listed as nonpacing components. Each prime item data requires as least eleven data cards for assembly, as outlined below.

TABLE 7. PRIME-ITEM DATA SET

Card type	Card content
*A1	Prime-item nomenclature and description
A2	Additional nomenclature (as applicable)
*R1	Monthly requirements buildup
*R2	Prime item requirement (Army)
*R3	Prime item requirement (Marine Corps)
*R4	Prime item requirement (Navy)

*Essential to proper data set formulation.

TABLE 7. PRIME-ITEM DATA SET (Cont'd)

Card type	Card content
*R5	Prime item requirement (Air Force)
*R6	Prime item requirement (Selected Allies)
*C1	Production capability data (first planned producer)
C1	Production capability data (second planned producer)
C1	Production capability data (last planned producer)
*N1	Prime item remarks (first entry) or remarks filler card
N1	Prime item remarks (second entry, as applicable)
N1	Prime item remarks (last entry, as applicable)
*E3	Prime-item (fuze-body) component data card
E2	Nonpacing fuze component #1 (as applicable)
E2	Nonpacing fuze component #2 etc., (as applicable)
*D1	Prime-item data set end marker

*Essential to proper data set formulation.

AGGREGATION OF DATA SETS.

49. Once data sets are assembled to represent each item and facility considered in a production base analysis, the data sets are aggregated into ten data groups. Each data group contains item or facility data of a related type, e.g., facility descriptive data, pacer component data, etc., and the data groups are arranged in the sequence required for data analysis by the APBA system. The aggregation of data sets into data groups and the arrangement of the data groups results in a semifinal deck of data cards. Finalization of this data deck requires the addition of only two data cards, with the resultant final deck depicted in Figure 3. The data deck is then transcribed onto a data tape using the procedures given in para 61 of this manual. Although the data sets within each group are arranged in alphabetical or ascending schedule number order, the final data deck does not list all items in a similar sequence due to APBA system requirements. The final APBA system output, however, does list the printed item analysis forms in ascending schedule number order and the printed facility analysis forms in alphabetical order.

50. The ten data groups are described in paragraphs 51 through 60 following, each of the data groups are listed in the order necessary to

assemble a semifinal data deck.

51. Deck 1 Facility Descriptive Data Group. This group consists of a series of facility and equipment data sets that are arranged in alphabetical order by facility name. The end of this data group is marked by a special "B3" card (see appendix B).

52. Deck 2 Facility-Remarks Data Group. This data group consists of sets of explanatory footnote (N2) cards for each facility listed in the facility descriptive data group, if such remarks are applicable. The sets of remarks cards are usually arranged in numerical order, based on the plant index number, but the program does not require any particular order as long as note cards for a particular facility are grouped together. The end of the facility-remarks data group is marked by a special "N2" card (see Appendix B).

NOTE: Only the two previous data groups require a special data card to mark the end of the data group. For the succeeding data groups, the last card of one data group is immediately followed by the first card of the next data group.

53. Deck 3 Pacer (Limiting-Component) Data Group. The pacer data group is composed of pacer data sets, that is, the data set for each component identified as a limiting factor in an end item data set by an "E3" card. The pacer data sets are arranged in ascending schedule number order within the data group. Each pacer data set terminates with an "E1" card; thus, the pacer data group terminates with the "E1" card of the pacer with the largest schedule number.

54. Deck 4 Hot-Base End-Item Data Set. The group contains a data set for each end item assumed to be actively produced the month prior to M-day. These hot-base end-item data sets are identified by a hot base requirement on the R6 card or a planned hot-base production rate on the C1 card(s) or both. If the hot base requirement or production rate are both zero, then the end item is not actively produced and should be transferred to the cold end-item data group. Each data set in the hot-base end-item data group is listed in ascending schedule number order.

55. Deck 5 Cold-Base End-Item Data Set. This data group consists of a data set representing each end item that is not produced the month prior to M-day (all facilities are inactive). Each cold end-item data set is identified by a zero hot-base requirement on the R6 card and a zero planned hot-base production rate on the C1 card(s). Cold-base end-item data sets are listed in ascending schedule number order within the cold end-item data group.

56. Deck 6 Separate-Issue-Fuze Data Group. The separate-issue-fuze data group includes a data set for each separate issue fuze, with the data sets listed in ascending schedule-number order. The user must insure that only fuzes required as both components and end items are

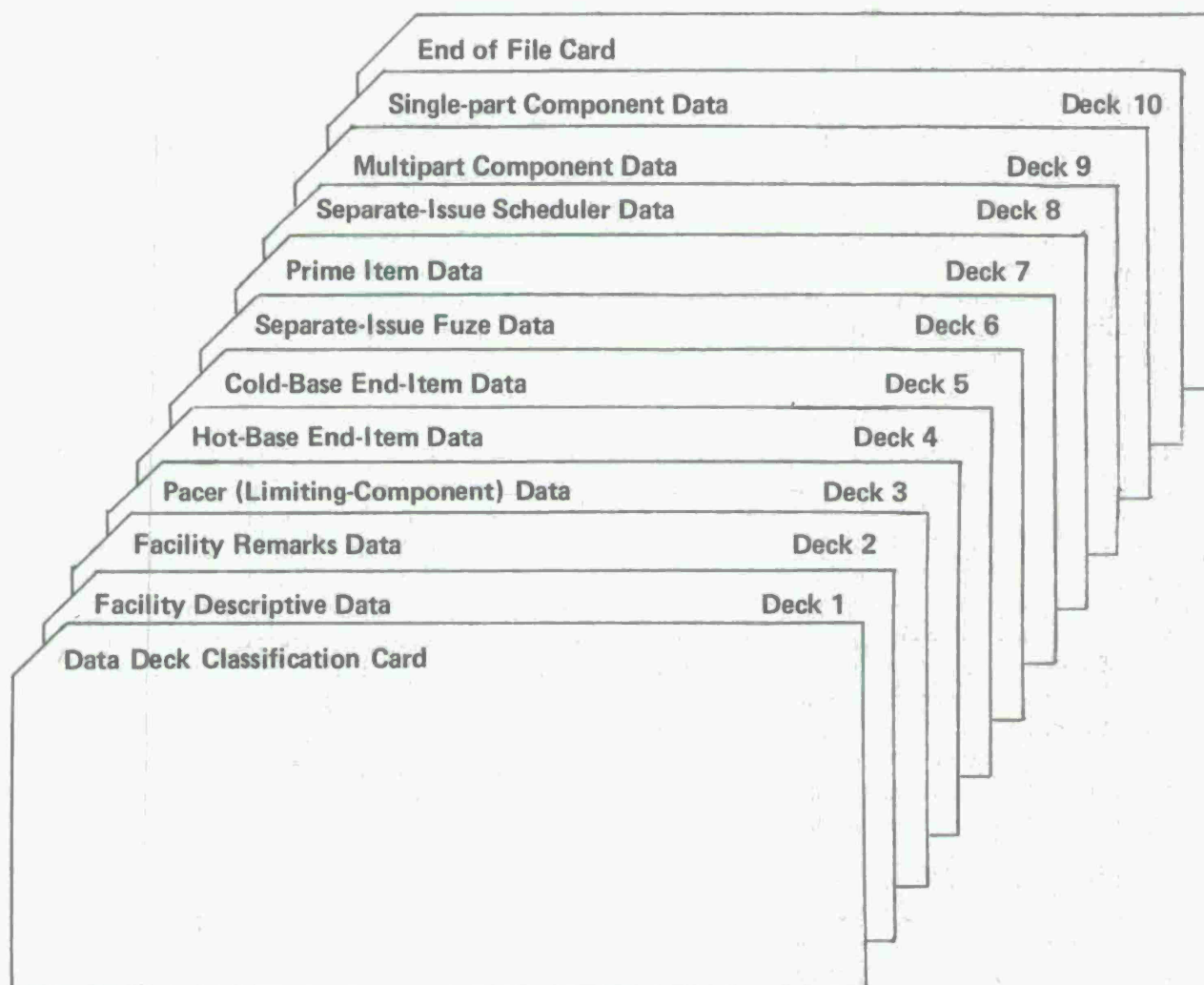


FIGURE 3. Final APBA Data Card Deck

included in this group.

57. Deck 7 Prime-Item Data Group. The prime-item data group consists of data sets for the principal metal part of each separate issue fuze. These prime-item data sets are arranged in ascending schedule-number order. The user should inspect each prime-item data set and insure that all component necessary to produce the appropriate separate issue fuze are listed therein.

58. Deck 8 Separate-Issue-Fuze Schedule Data Group. This data group consists of a series of separate-issue-fuze schedule data sets, and is almost identical to the separate-issue-fuze data group. The former group loads the requirements for separate issue fuzes as end items while the latter group computes the schedule of availability for issuance of separate issue fuzes. As in the separate-issue-fuze data group, the separate-issue-fuze schedule data sets are listed in ascending schedule-number order. In order to distinguish deck 8 from deck 6, in the update sort routines, a dash is placed in column 3 of each card in deck 8.

59. Deck 9 Multipart Component Data Group. This data group is not included in the master data file if a complete component breakdown is provided in each end-item data set. That is, if the procedure recommended in para 39 is followed, no multipart component data group is used. In this case, the separate-issue-fuze schedules data group (para 58) is followed by the single-part component data group (para 60). However, if an incomplete breakdown is furnished, multipart components are required and a multipart component group is necessary. These multipart component data sets utilize E2 cards, in a manner similar to end-item data sets, to provide additional component breakdown information. The multipart component data group consists of a series of multipart component data sets that are arranged in ascending schedule-number order. Hence, only those component data sets that generate requirements for other components are included in this group.

60. Deck 10 Single-Part Component Data Group. This data group consists of data sets that represent the nonpacing components specified in each end-item data set (and each multipart component data set, if utilized) in the preceding data groups. Each nonpacing component is identified by an E2 card in an end-item data set and the resultant number of component data sets in the single-part component data group is the greatest of all ten data groups. Each of these single-part components is said to be "end-item paced" that is, the production of each component is limited by the production capability of the end items which will utilize that component. Hence, each component data set utilizes one E3 card to specify call in from storage the month-by-month end-item utilization. These component data sets are arranged in ascending schedule-number order to formulate the single-part component data group. NOTE: As related components are assigned similar schedule numbers, arrangement in this manner results in the aggregation of components into three subdivisions: metal parts, propellants and explosives,

and component LAP operations. Components included in the metal parts category have schedule numbers assigned from 10,000 to 19,999; components in the propellants and explosive category have schedule numbers from 50,000 to 59,999; components that fall in the component LAP category have numbers assigned between 80,000 and 89,999.

FORMULATION OF THE APBA INPUT-DATA TAPE.

61. With the assembly and arrangement of the data groups as directed in paras 51 through 60 (also see Figure 3), the user completes the formulation of a semifinal input-data deck. Only two additional data cards are necessary to complete finalization of this data deck so that the information contained therein can be transferred onto a data tape. The first is a classification card that is placed at the front of the data deck and specifies the classification of the information listed in the data deck. This card is fashioned by punching the letters "UNCLASSIFIED" or "CONFIDENTIAL" as applicable, in card columns 1-12 respectively, with the remainder of the card left blank. The second card is an end-of-file card of the data deck and indicates the end of the input data file. Where the IBM 360 series computer is used, this card is fashioned by entering the characters "/"* in card columns 1 and 2 respectively, with the remainder of the card left blank. The final input-data deck is then transferred to a data tape by using any standard card-to-tape write program. The resultant data tape, upon verification of the data by the PBAVER program, is then used as the initial input-data tape to the APBA system.

Next page is blank.

REFERENCES

1. The Industrial Readiness Assurance Program Production Base Analysis, AMSU-PP-PDIM, January 1974; U.S. Army Armament Command, Rock Island, Ill. SECRET Report.
2. Letter, US Army Materiel Command, AMCRP-OIP, Subject: "Production Base Plan (RCS AMCRP-124)," dated 8 June 1972, UNCLASSIFIED.
3. Memorandum, Joint Panel for Development of a Coordinated Management System for the Ammunition Production Base, RCS: DD-I&L(AR) 1072, subject: "Final Report on the Ammunition Production Base Economic Decision Models", 10 April 1972, UNCLASSIFIED.
4. DOD Manual 4005.3-M, Industrial Preparedness Planning Manual, Department of Defense, 24 July 1972, UNCLASSIFIED.
5. Aamodt, W. and Karon S.; US Army Munitions Command Operations Research Group, APBA Systems Programmer's Manual, US Army Systems Analysis Office, Rock Island Arsenal, Illinois, UNCLASSIFIED. (A Computer Tape)
6. User's Guide to the Base Retention Analysis System Update Procedure, AMSMU-MI-SE, US Army Munitions Command, 12 April 1973.
7. End Item and Component Master File, AMSMU-PP-PDIM, US Army Munitions Command, 30 August 1971, UNCLASSIFIED Report.
8. Defense Supply Agency, Register of Planned Emergency Producers (RPEP); DOD 4005.3-H, 1 April 1971; UNCLASSIFIED.
9. Army Industrial Plant Equipment Inventory - ASOD Items (DIPECSP33); Defense Supply Agency, 31 May 1972; UNCLASSIFIED.
10. End Item and Component Master File; AMSMU-PP-PDIM, US Army Munitions Command, Ammunition Procurement & Supply Agency, 30 August 1971; UNCLASSIFIED.
11. Department of the Army DCSLOG DDPC, President's Budget File, August 1972, SECRET.

Next page is blank.

GLOSSARY
OF
INDUSTRIAL READINESS PLANNING TERMS

(Used in Conjunction With)

THE APBA SYSTEM

Allocation of Capacity - An allocation of capacity means the specified plant is capable of manufacturing the designated item in accordance with the planned schedule. Such production will not interfere with current military production or with the planned production of other items for which plant capacity has also been allocated.

Approved Forces - The level of forces (U.S. and allies) approved by the Secretary of Defense for industrial preparedness planning.

Armed Services Production Planning Officer (ASPPPO) - The DOD designee responsible for performing industrial preparedness planning in plants under his jurisdiction.

Base Component - Synonymous with the term "critical component".

Base Item - An ammunition or materiel item required at mobilization that is included in industrial preparedness planning as the item is not normally produced in the commercial sector during peacetime and Government-owned equipment and/or specialized knowledge is required for production at mobilization, e.g., 2.75 inch rockets, Composition B, etc. (Note: Industrial Preparedness Planning for an end item that has no critical components, but is required at mobilization, will only include planning for the end item LAP operation.)

Bulk Issue End Item - An ammunition or equipment item that is both issued as a complete end item in the field and utilized in the manufacture of another end item, e.g., the M34 WP smoke grenade, which is issued as produced but also used to produce the XM176 WP/MC launcher.

COCO Facility - A contractor-owned, contractor-operated facility that is included in industrial preparedness planning for production of ammunition or materiel. The planned production rates, duration of the planning period, and the Government-owned equipment utilized for production (if any) are specified on DD Form 1519.

Cold Base - A planned production facility that is not currently producing and/or is not scheduled to be producing the planned item on the designated M-Day.

Critical Component - Any constituent part of an ammunition or equipment end item that is included in Industrial Readiness Planning as it is unavailable in sufficient quantity from the commercial sector. (A non-base component is not a critical component for Industrial Preparedness

Planning purposes, by definition, although it may be required for manufacture of a base end item.)

D-Day - The day on which an operation commences or is to commence. This may be the commencement of hostilities, military operations, or other operations. (D-Day and M-Day may occur simultaneously or M-Day may precede D-Day.)

D-P Concept - The idea of providing for the full materiel support of the approved forces during a limited war by the advance accumulation of reserve stocks in quantities which, combined with peacetime operating stocks and estimated incremental deliveries from post D-Day production, will be sufficient to satisfy the total post D-Day military demand until P-Day.

D-P Inventory Deficit - The materiel that must be stored as inventory to supplement the incremental post D-Day production in order to support the approved forces until P-Day, after mobilization.

End Item - An item of ammunition or equipment that is produced in the same configuration as issued to the user in the field, e.g., M1 105-mm cartridge WF, M107 155-mm projectile WOF, ABC-M18A2 Cml Agt Detector Kit, 8-Inch Propelling-Charge M1 GB. (For special categories of end items, see also "Separate Issue Fuze" and "Bulk-Issue End Item".)

Facility - Industrial property (other than material, special tooling, special test equipment, and military property) utilized for production, maintenance, research, development or test, including real property and rights therein, buildups, structures, improvements, and plant equipment.

GFE - Government-owned equipment that is furnished to a facility in order that the designated mobilization production schedule is met.

GOCO Facility - A Government-owned, contractor-operated facility that is planned for production of ammunition or materiel.

Hot-Base - A planned production facility that is currently producing and/or scheduled to be producing an item when M-Day occurs. (Various degrees of a "hot base" may exist, i.e., production from the minimum sustaining rate up to production at the planned maximum capacity.)

Industrial Preparedness Planning - Planning designed to maintain an adequate industrial base to support DOD requirements for selected essential military items in a national emergency.

Level-Off Rate - The planned monthly production quantity which, when attained, is sufficient to sustain the required monthly consumption of ammunition and materiel by approved forces.

Limited War - Armed conflict short of Nuclear War, exclusive of incidents,

involving the overt engagement of the military forces of two or more nations.

Limiting Component - That component of an ammunition end item that precludes production of the end item at the planned LAP rate due to the limited availability of the component sometime prior to P-Day.

Load, Assemble and Pack (LAP) - A term describing the production process whereby selected components are integrated into a single assembly. Such an assembly is either a loaded component, e.g., an artillery fuze, or an end item.

M-Day - The term used to designate the day on which mobilization is to begin.

Minimum Sustaining Rate (MSR) - The lowest monthly rate at which the planned item can be produced without increasing the unit cost above the cost of the item which would apply in a maximum single shift operation.

Mobilization - The act of preparing for war or other emergencies through assembling and organizing national resources; the process by which the Armed Forces or part of them are brought to a state of readiness for war or other national emergencies.

Mobilization Production Requirement - The quantity of an item, expressed as a rate, which must be produced after M-Day in order to provide the materiel support necessary for approved forces in a limited war.

Mobilization Production Schedule - A planned schedule of production for a specific source applicable to an individual item or group of selected items, which has been validated by the responsible ASPPO.

Nonbase Item - Ammunition or materiel, required at mobilization, that is not included in Industrial Preparedness Planning, as the item is readily available from the commercial sector in the quantity required or if requirements for the item are so insignificant that mobilization production planning is not required.

P-Day - That point in time at which the mobilization requirement of a military item is satisfied and will continue to be satisfied solely from production. Current Industrial Preparedness Planning for ammunition items assumes that P-Day will occur no later than M+24.

Pacer - A contraction of the term "pacing component."

Pacing Component - Synonymous with the term "limiting component."

Planned Producer - An industrial firm which has indicated its willingness to produce specified military items in a national emergency by consummating a production planning schedule. (DD Form 1519).

Planning Item - Any item selected for industrial preparedness planning under the criteria of DOD Instruction 4005.3.

Plant Index Number (PIN) - A unique six-digit number assigned to each facility listed in the DOD Register of Planned Emergency Producers (DOD-RPEP).

Prime Item - The limiting component of a separate issue fuze; usually the principal metal component, i.e., the fuze body.

Procurement Factor - The average quantity of a single component that is required to produce one end item. (The procurement factor, expressed to six decimal places, includes a loss element of 1-10% that compensates for components found to be unsuitable, e.g., rusty, damaged, etc.)

Production Acceleration Table - A production rate table, utilized to compute the monthly incremental acceleration in the production rate of a planned facility. Input to the table consists of the planned production rate at P-Day and the state of readiness or planned production rate at M-Day.

Production Goal - The production rate which each planned producer is schedule to attain by M+24 in order to satisfy mobilization production requirements, i.e., the maximum planned utilization of each facility.

Production Leadtime - The number of months required for a facility to produce the first unit of output, starting from a cold (inactive) state, assuming all necessary input (personnel, materiel, equipment, etc.) are available upon activation of the facility.

Register of Planned Emergency Producers - An annual publication of the Department of Defense listing every planned producer and every procuring activity, as well as the address of the officially assigned ASPPO for each plant.

Schedule Number - A unique four- or five-digit number assigned to each ammunition end item and critical component, as listed in the USAMUCOM End-Item and Component Master File.

Self-Pacer - An end item whose production is limited only by the assigned LAP production capability. Such an end item has no limiting component even though several critical components may be necessary to produce the item.

Separate Issue Fuze - A fuze that is both utilized in the LAP operation of an ammunition end item and issued as a separate item of ammunition.

M-Day Readiness Status - Synonymous with the term "production leadtime".

APPENDIX A
STANDARD DATA CARD FORMATS

Next page is blank.

APPENDIX A

STANDARD DATA CARD FORMATS

A-1. This appendix details the data content and the format specifications for each type of standard data card utilized in the Automated Production Base Analysis (APBA) System. (Nonstandard/special data card formats are detailed in Appendix B.) Examples of each type of data card are included after the format specifications for each card. Individual data card types are described herein as follows:

Table A-1. Standard Data Card Types

Type of Data Card	Content	Page
F1	Facility Description (Part 1)	54
F2	Facility Description (Part 2)	54
B3	Production Equipment/Facility Layaway Data	55
N2	Facility Remarks (Footnotes)	57
A1	Item Description (Part 1)	59
A2	Item Description (Part 2)	61
R1	Build-up of User Requirements	62
R2-R6 *	Mobilization/Hot Base Requirements	63
C1	Facility Production Capabilities/Product Assignments	65
N1	Item Remarks (Footnotes)	68
E1	Pacing Component Data (Component Set)	72
E2	Non-pacing Component Data	73
E3	Pacer Designation (End Item and Component Sets)	74
E4	Separate Issue Fuze Component Data (End Item Set)	76
E5	Separate Issue Fuze Loader (Sep. Iss. Loader Data Set Only)	77
D1	Data Set End Marker	77

*The R2, R3, R4, R5, and R6 data cards all utilize the same basic format and contain the same type of data; hence, those R cards are treated as a single type.

FACILITY DESCRIPTION: F1 CARD

CONTENT SUMMARY

A-2. The F1 data card contains the first two lines of the description (name and address) assigned to a planned producer, as listed in Section 1, AMC Form 1447. Each F1 card requires entry of a plan index number (P.I.N.); if a PIN is not assigned to a facility (check the DOD Register of Planned Emergency Producers), a temporary PIN is assigned, (See Appendix C). An F1 card is formulated for each planned producer, X-facility, M-day action, and nonstandard facility.

Table A-2. F1 Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type</u> : Enter "F1"
3	Blank.
4-9	<u>Plant Index Number (PIN)</u> : Enter six digits corresponding to the PIN assigned to the subject facility, beginning in card column 4; if fewer than six digits, enter a zero in card column 4, then 5, etc. until a total of six digits are entered on the card.
10	Blank.
11-45	<u>Facility Description</u> : Enter the appropriate letters and/or numbers corresponding to the first line of the facility name and address listed in Section 1, AMC Form 1447. Leave unused portion blank.
46-79	<u>Facility Description</u> : Enter the appropriate letters and/or numbers corresponding to the second line of the facility name and address listed in Section I, AMC Form 1447. Leave unused portion blank.
80	Blank.

FACILITY DESCRIPTION: F2 CARD

CONTENT SUMMARY

A-3. The F2 data card contains the third and fourth lines of the name and address assigned to a planned producer, as listed in Section I, AMC Form 1447. The F2 card format is very similar to the F1 card format and an F2 card is required for each F1 card formulated.

Table A-3. F2-Card Format Specifications

Card Column(s)	Data Entry
1-2	<u>Card Type:</u> Enter "F2"
3	Blank.
4-9	<u>Plant Index Number:</u> Enter six digits as specified on the F1 card.
10	Blank.
11-45	<u>Facility Description:</u> Enter the letters and/or numbers corresponding to the third line of the facility name and address; leave the entire portion blank if a third line is not used.
46-69	<u>Facility Description:</u> Enter the letters and/or numbers for the fourth line of the facility name and address; if no fourth line, leave blank.
70-80	Blank (used for ASOD package number specified on the B3 card).

GOVERNMENT-OWNED EQUIPMENT AND LAYAWAY DATA: B3 CARD

CONTENT SUMMARY

A-4. The B3 card contains all the data listed in Section I and II of AMC Form 1447 except the facility name and address and the percentage ratio of the annual maintenance cost to the replacement value for the ASOD package. A B3 card is required for each F1 card fashioned. (If no government-owned equipment or layaway data is available, only card columns 1-9 require entries).

Table A-4. B3-Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type:</u> Enter "B3"
3	Blank.
4-9	<u>Plant Index Number:</u> Enter six digits, as specified on the F1 card.
10	Blank

Table A-4. (Cont'd)

Card column(s)	Data Entry
11-18	<u>PVN Coordinates</u> : Enter the appropriate letter or digits. If there are less than eight characters, use right justification; if no PVN coordinates, leave blank.
19	Blank.
20-21	<u>Zone Coordinates</u> : Enter the appropriate digits; if none, leave blank.
22	Blank.
23-27	<u>North Coordinates</u> : Enter the appropriate digits; if none, leave blank.
28-29	Blank.
30-33	<u>East Coordinates</u> : Enter the appropriate digits; if none, leave blank.
34	Blank.
35-39	<u>ASOD Equipment Package Number</u> : Enter the number, and/or special characters identifying the Government-owned equipment package, beginning in column 35. If more than one ASOD package is assigned to the facility, enter the first on the B3 card and use the facility remarks (N2) cards for the remaining ASOD packages. If no ASOD package is used, leave blank.
40	Blank.
41-43	<u>Type of Equipment</u> : Enter the letters designating the ASOD type, beginning in column 41; if none, leave blank.
44	Blank.
45-57	<u>Equipment Location</u> : Enter the letters used to specify the ASOD package location, beginning in column 45; if none, leave blank.
58-62	<u>Number of Pieces</u> : Enter the digit(s) that correspond to the number of items of equipment in the ASOD package. Use right justification (entry ends in column 62; leave unused spaces on left side of entry

Table A-4. (Cont'd)

Card Column(s)	Data Entry
	blank). If no entry, leave blank.
63-72	<u>Replacement Value:</u> Enter the digits that correspond to the number given for the replacement value of the ASOD package. Use right justification. Enter the digits only; do not insert a dollar sign (\$), a comma (,), or a period (.) with the entry. If no entry, leave blank.
73-79	<u>Maintenance Value:</u> Enter the digits representing the annual maintenance cost of the ASOD package in the same manner as the replacement value entry. (Digits only; use right justification; if none, leave blank).
80	<u>All B3 Cards Except the last:</u> Blank. Last B3 card in facility data group; enter the digit "1" (refer to Appendix B).

FACILITY FOOTNOTES AND REMARKS: N2 CARD

A-5. The N2 card is used to store the facility footnotes and remark listed in Section IV, AMC Form 1447. Each N2 card contains sufficient information to represent half of a line as printed in the final output. That is, each N2 card corresponds to the left (first) half or the right (second) half of a single line of remarks. In producing the final output, these segments are arranged by the PBAPBS program to form complete footnotes using the N2 card codes given in the format specifications following. A special N2 card is required at the end of the facility remarks data group (see Appendix B).

Table A-5. N2-Card Format Specifications

Card Column(s)	Data Entry
1-2	<u>Card Type:</u> Enter "N2"
3	Blank.
4-8	<u>Item Schedule Number:</u> If the remark is applicable to the planned utilization of a facility for production of a specific item, enter the item schedule number (digits) using right justification. If not applicable, leave blank.
9-10	Blank.

Table A-5. (Cont'd)

Card Column(s)	Data Entry												
11-16	<u>Plant Index Number (PIN):</u> Enter the digits corresponding to the PIN of the facility to which the remarks apply.												
17	Blank.												
18	<p><u>Footnote Category Code:</u> Each N2 card specifies the type of information stored on that card. There are four general categories used. Enter the digit corresponding to the appropriate category as follows:</p> <table> <tr> <th><u>digit</u></th><th><u>category</u></th></tr> <tr> <td>"1"</td><td>Remarks applicable to the number of pieces of equipment in the ASOD package.</td></tr> <tr> <td>"2"</td><td>Remarks applicable to the replacement value of the ASOD package.</td></tr> <tr> <td>"3"</td><td>Remarks pertinent to the maximum planned use of the facility for production of a specific end item or component.</td></tr> <tr> <td></td><td>NOTE: Only one set of cards designating category codes "1" and "2" may be used with each facility; only one set of cards specifying category "3" may be used with each item produced by the facility; there is no limit on the number of footnote card sets using category code "4" below.</td></tr> <tr> <td>"4"</td><td>Any other remarks pertinent to facility operation, modification, etc. that are not specified by category codes "1", "2", and "3".</td></tr> </table>	<u>digit</u>	<u>category</u>	"1"	Remarks applicable to the number of pieces of equipment in the ASOD package.	"2"	Remarks applicable to the replacement value of the ASOD package.	"3"	Remarks pertinent to the maximum planned use of the facility for production of a specific end item or component.		NOTE: Only one set of cards designating category codes "1" and "2" may be used with each facility; only one set of cards specifying category "3" may be used with each item produced by the facility; there is no limit on the number of footnote card sets using category code "4" below.	"4"	Any other remarks pertinent to facility operation, modification, etc. that are not specified by category codes "1", "2", and "3".
<u>digit</u>	<u>category</u>												
"1"	Remarks applicable to the number of pieces of equipment in the ASOD package.												
"2"	Remarks applicable to the replacement value of the ASOD package.												
"3"	Remarks pertinent to the maximum planned use of the facility for production of a specific end item or component.												
	NOTE: Only one set of cards designating category codes "1" and "2" may be used with each facility; only one set of cards specifying category "3" may be used with each item produced by the facility; there is no limit on the number of footnote card sets using category code "4" below.												
"4"	Any other remarks pertinent to facility operation, modification, etc. that are not specified by category codes "1", "2", and "3".												
19	<u>Start/Continue Indicator:</u> If the footnote card starts a new footnote, enter the digit "1", if the footnote card is a continuation of a footnote, leave blank.												
20-75	<u>Footnote/Remarks Entry:</u> Enter the appropriate remarks according to the following procedure: if the entry will correspond to the left (first) half of a line, use all available spaces. If the entry will correspond to the right (second) half of												

Table A-5. (Cont'd)

Card Column(s)	Data Entry
	a line, end with a complete word or divide the word, so as not to exceed the available spaces. Do not end with a partial word or dollar amount, as the next footnote entry will begin as the left half of the next line.
76	Blank.
77-78	<u>Footnote Card Number:</u> The remarks for each facility generally consist of a series of footnote cards. The footnote cards for each facility must be numbered consecutively for each facility, i.e., enter the digits "01" for the first card, "02" for the second card, etc.
79	Blank.
80	<u>Following Card Indicator:</u> If the following footnote card to be used denotes the start of a new footnote, leave card column 80 blank; if the following card corresponds to the left (first) half of a footnote continuation, enter the digit "1", if the following footnote card corresponds to the right (second) half of a footnote card, enter the digit "2".

END ITEM AND COMPONENT NOMENCLATURE: A1 CARD

CONTENT SUMMARY

A-6. The A1 card contains the first line of nomenclature, the modernization code, and the responsible activity for an end item or component, as listed in Section I, AMC Form 1446. An A1 card is required for each end item and component included in the Production Base Analysis.

Table A-6. A1-Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type:</u> Enter "A1".
3	Blank (Dash in deck 8).
4-8	<u>Item Schedule Number:</u> Enter the digits corresponding

Table A-6. (Cont'd)

Card Column(s)	Data Entry
	to the schedule number for an end item or component using right justification (card column 4 for end items will be blank, column 4 for components will contain a digit indicating the type of component; MPTS, P&E, or LAP).
9	Blank.
10-57	<u>Nomenclature (first line)</u> : Enter the nomenclature for the end item or component as specified in the MUCOM End Item and Component Master File. Leave unused columns blank. If additional space is required, use an A2 card.
58	<u>Nomenclature Continuation Indicator</u> : If the space for the nomenclature is insufficient, enter the digit "1" to indicate an A2 card is necessary. Otherwise, leave blank.
59-61	<u>Modernization (MOD) Code</u> : Enter letters designating the type classification of the item as follows: "STD" for "Standard" "DEV" for "Development" "(blank) LP" for "Limited Production".
62-65	Blank.
66-69	<u>Responsibility Activity</u> : Enter letters representing the agency responsible for mobilization production planning of the end item or component, as follows: "ARMCOM" for US Army Armament Command "EA (& 2 blanks)" for Edgewood Arsenal "FA (& 2 blanks)" for Frankford Arsenal "PA (& 2 blanks)" for Picatinny Arsenal "HDL (& 1 blank)" for Harry Diamond Laboratory.
70	Blank.
71	<u>Production-Goal Card Indicator</u> : If production goal cards are required (See Appendix B,)

Table A-6. (Cont'd)

Card	Column(s)	Data Entry
		enter the digit "1"; if not, leave blank.
72-79		Blank.
80		<u>Item Type Indicator:</u> If item is used only for training and is, therefore, stockpiled for only three months for D to P storage, insert the digit "1" in column 80. If the item is a nonbase item, that is, an item for which only seven-month requirement is included in the D-to-P stockpile, insert the digit "2" in column 80. In all other cases leave column 80 blank.

ADDITIONAL END ITEM OR COMPONENT NOMENCLATURE: A2 CARD

CONTENT SUMMARY

A-7. The A2 card contains additional end item or component nomenclature that was not included on the A1 card due to insufficient space. An A2 card is necessary only if additional item is required.

Table A-7. A2-Card Format Specification

Card	Column(s)	Data Entry
1-2		<u>Card Type:</u> Enter "A2".
3		Blank (Dash in deck 8).
4-8		<u>Item Schedule Number:</u> Enter the same digits as used on the A1 card that had insufficient space for the entire item nomenclature. Use right justification.
9		Blank.
10-57		<u>Additional Nomenclature:</u> Enter the additional nomenclature or description, beginning in card column 10. Leave unused columns blank.
58-80		Blank.

MONTH-BY-MONTH USER REQUIREMENTS: R1 CARD

A-8. The R1 card is used to enter the buildup of user requirements to enable computation of the D-to-P stockpile requirements. If this card is left blank, it will result in a listing of zero D-to-P stockpile for the item.

Table A-8. R1-Card Format Specifications

Card Column(s)	Data Entry
1-2	<u>Card Type</u> : Enter "R1".
3	Blank(Dash in deck 8)..
4-8	<u>Item Schedule Number</u> : Enter the digits for the end item or component using right justification.
9-30	Blank.
31-37	<u>User Requirement in M+1</u> : Enter the sum of the requirements for all users for the month following M-day.
38-44	User Requirement in M+2.
45-51	User Requirement in M+3.
52-58	User Requirement in M+4.
59-65	User Requirement in M+5.
66-72	User Requirement in M+6 thru M+24.
73-79	Blank.
80	<u>Unit of Measure</u> : Enter a letter to designate the unit of measure used on the entries in columns 38 thru 72, as follows: " E " units of each. " T " units of tens. " H " units of hundreds. " K " units of thousands. " M " units of millions.

MOBILIZATION AND CURRENT BUY REQUIREMENTS: R2-R6 CARDS

CONTENT SUMMARY

A-9. A series of five "R" cards is used to store the mobilization requirements for each end item and component, as listed in Section II, AMC Form 1446. The R6 card in the series is also used to store the planned monthly buy requirement for the current fiscal year. One set of "R" cards is necessary for each end item or component included in the production base analysis. Additional information that may be included on the "R6" cards is: Department of Defense Ammunition Code (DODAC) and an abbreviated (6 character) Standard Study Number (SSN), as applicable.

Table A-9. R2-R6 Card Format Specifications

Card Column(s)	Data Entry
1	<u>Card Type:</u> Enter the letter "R".
2	<u>Service User Code:</u> Enter a digit identifying the using service requirements, as follows: "2" US Army "3" US Marine Corps "4" US Navy "5" US Air Force "6" Selected Allied (also Current Budget Buy).
3	Blank (Dash in deck 8).
4-8	<u>Item Schedule Number:</u> Enter the digits for the end item or component using right justification.
9-16	<u>Department of Defense Ammunition Code (DODAC):</u> Enter the numbers and letters for the eight-character code beginning in column 9; if none, leave blank (most components are not assigned a DODAC). This information needs to be loaded only on the R6 card. Other cards may be left blank.
17-27	<u>Standard Study Number (SSN):</u> Space is available for the full eleven-character SSN; if an abbreviated six-character SSN is used, leave card columns 23-27 blank. If no SSN, leave entry blank. This information needs

Table A-9. (Cont'd)

Card Column(s)	Data Entry
	to be loaded only on the R6 card. Other R cards may be left blank.
28-30	Blank.
31-37	<u>Level-1 Requirement:</u> Enter the mobilization requirement corresponding to Level 1 for the user specified in Column 2, using the appropriate numbers and a decimal point (e.g., 1344.). Use the same unit of measure (see card column 80) for each user. If zero, leave blank.
38-44	<u>Level-2 Requirement:</u> Enter the level-2 mobilization requirement for each service using the same procedure as outlined for the level-1 requirement.
45-51	<u>Level-3 Requirement:</u> Enter the level-3 mobilization requirement for each service using the same procedure as outlined for level-1 requirement.
52-58	<u>Level-4 Requirement:</u> Enter the level-4 mobilization requirement for each service using the same procedure as outlined for the level-1 requirement.
59-65	<u>Retention Level Requirement:</u> Enter the retention level requirement for each service using the same procedure as outlined for the level-1 requirement.
66-72	Blank.
73-79	<u>Current Buy (Hot-Base) Requirement:</u> For R2-R5 cards, leave these card columns blank; for the R6 card, enter the average monthly planned production rate, using digits and a decimal point, that corresponds to the total buy quantity (all services) planned during the current fiscal-year period for the end item or component.
80	<u>Unit of Measure:</u> Enter a letter to designate the quantitative multiple of each requirement

Table A-9. (Cont'd)

Card Column(s)	Data Entry
----------------	------------

entry, as follows:

"E" for units of each (100.E=100).

"T" for units of tens (100.T=1000).

"H" for units of hundreds (100.H=10000).

"K" for units of thousands (100.K=100000).

"M" for units of millions (100.M=100000000).

FACILITY PRODUCTION CAPABILITIES/ASSIGNMENTS: C1 CARDS

CONTENT SUMMARY

A-10. The C1 card lists the production capabilities, priority of retention and associated production information for each facility assigned to produce an item of materiel, as given in Section III of the AMC Form 1446 for that item. Each end-item and component data set requires at least one C1 card for proper formulation. (See Appendix C for special designations of facility plant index numbers). The C1 card is the key to the development of the standard hot-base and cold-base production-buildup schedules that are generated for entry in Section IV of the ADP AMC Form 1446. Nonstandard production-response curves or modifications to the capabilities entered on the C1 card require the additional use of U cards with the basic C1 card (see Appendix B).

Table A-10. C1-Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type:</u> Enter "C1".
3	Blank (Dash in deck 8).
4-8	<u>Item Schedule Number:</u> Enter the schedule number of the end item or component, for which the assigned producers will be listed in columns 14-19. Use right justification.
9-10	<u>Facility Priority of Retention:</u> Enter digits designating the retention priority for the facility assigned in columns 14-19 as follows:

Table A-10. (Cont'd)

Card Column(s)	Data Entry
	<p>"01" for the first (highest priority) facility:</p> <p>"02" for the second (next highest retention priority) facility, etc. (all actively producing "hot" facilities are assigned the highest retention priority; then inactive "cold" facilities listed in order of planned reactivation).</p>
11	Blank.
12	<p><u>Last Facility Indicator:</u> If the facility listed in columns 14-19 is the last facility assigned to produce the item listed in columns 4-8, enter the digit "1"; if additional facilities are assigned to produce the item, leave blank.</p>
13	<p><u>Nonstandard Production Indicator:</u> If a U card is used to specify a nonstandard production response for use with the facility, enter the digit "1". If production buildup is standard, leave blank.</p>
14-19	<p><u>Planned Production Facility - Plant Index Number:</u> Enter the plant index number (PIN) for the facility assigned to produce the item specified in Columns 4-8.</p>
20-25	<p><u>Planned Production Increase:</u> If the total production given in columns 57-63 includes capability planned but not yet in existence, the amount of capability not presently existing should be entered in columns 20-25.</p>
26-27	<p><u>Increased Production Leadtime:</u> The number of months after M-day before the increased production will be available.</p>
28-33	<p><u>DD Form 1519 Expiration Date:</u> Enter the contract expiration date using a three-letter entry for the month; leave card column 30 blank, and a two-digit entry for the year, e.g. APR 73". If the expiration date is not available, leave blank.</p>
34-36	<p><u>ASPPO Code:</u> Enter the appropriate three digits for the Armed Services Production Planning Officer (ASPPO) code applicable to the planned production facility; if none, leave blank.</p>

Table A-10. (Cont'd)

Card Column(s)	Data Entry								
37	Blank.								
38	<u>Business Classification:</u> Enter the letter "S" for small business or "L" for large business as designated by ARMCOM P&P; if none, leave blank.								
39-44	<u>Minimum Sustaining Rate (MSR):</u> Enter the MSR of the facility using the appropriate digits and a decimal point. (All rates use the unit of measure specified in card column 72.)								
45-50	<u>1-8-5 Rate:</u> Enter the one-shift (8 hour, 5 day week) rate in the same manner as the MSR.								
51-56	<u>2-8-5 Rate:</u> Enter the two-shift (16 hours, 5 day week) rate in the same manner as the MSR.								
57-63	<u>Maximum (MAX) Rate:</u> Enter the maximum production rate (for a single item) in the same manner as MSR.								
64-69	<u>Current (Hot-Base) Rate:</u> Enter the current monthly production rate, i.e. the rate of production assumed at M-1. (Planned buys may exceed the planned prorata maximum production but in such a case the U card must be used.)								
70-71	<u>Production Leadtime:</u> Enter a two-digit number that corresponds to the number of months required, upon activation of a facility, for that facility to produce one item, assuming all necessary raw materials and components are available upon activation, e.g. "03" for three months; "11" for eleven months, etc. Administrative leadtime is assumed as zero months.								
72	<u>Unit of Measure:</u> Specify a unit of measure, based on the largest production rate, as follows:								
	<table> <tr> <th>Max Rate</th><th>Unit of Measure</th></tr> <tr> <td>1 - 99,999</td><td>"E" (each)</td></tr> <tr> <td>100,000 - 99,999,999</td><td>"K" (thousands)</td></tr> <tr> <td>over 100,000,000</td><td>"M" (millions)</td></tr> </table>	Max Rate	Unit of Measure	1 - 99,999	"E" (each)	100,000 - 99,999,999	"K" (thousands)	over 100,000,000	"M" (millions)
Max Rate	Unit of Measure								
1 - 99,999	"E" (each)								
100,000 - 99,999,999	"K" (thousands)								
over 100,000,000	"M" (millions)								
73-80	<u>Individual Line of Area Designation:</u> The Army Ammunition Plants and selected Arsenals utilize specific lines or areas within the same building								

Table A-10. (Cont'd)

Card Column(s)	Data Entry
----------------	------------

or complex to manufacture dissimilar items.
If identification of the line or area is desired,
enter the line or area designation e.g., "line X",
or "A + 13", etc.

ITEM FOOTNOTES AND REMARKS: N1 CARD

CONTENT SUMMARY

A-11. The N1 card stores the item footnotes and remarks given in Section V, AMC Form 1446. The N1 card is similar, but not identical, to the N2 card used for facility footnotes and remarks. Each N1 card corresponds to the left (first) half or right (second) half of a footnote line, with the PBAPBS joining the two halves to form a complete line. Each end item and component data set requires at least one N1 card, even if the footnote entry space (card columns 20-75) is blank.

Table A-11. N1-Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type</u> : Enter "N1".
3	Blank (Dash in deck 8).
4-8	<u>Item Schedule Number</u> : Enter the item schedule number for which remarks are applicable. Use right justification.
9-14	Blank.
15-16	<u>Facility Retention Priority</u> : If an item footnote refers to an assigned producer or the maximum capability of an assigned producer (footnote codes 2 or 3 in column 18), enter the retention priority of the facility in this block; otherwise, leave blank, e.g. "01", "02", "12", etc.
17	Blank.
18	<u>Footnote Category Code</u> : Enter the digit corresponding to the category of the item footnote, as follows: "1" Remarks to item nomenclature.

Table A-11. (Cont'd)

Card Column(s)	Data Entry
"2"	Remarks pertinent to an individual facility assigned to produce the item.
"3"	Remarks applicable to the planned maximum production capability of an assigned facility.
"4"	All remarks pertaining to the item entry (1446) but not to any specific part of the entry.
"5"	Footnotes referring to the facility column entered in Section IV of the 1446.
"6"	Designation of the facilities assumed to be hot base.
"7"	Footnotes cross-referencing end items and associated components or components with their associated end items.
"8"	Footnotes referring to the leadtime entry in Section I of the 1446.
"9"	Remarks to be printed in the facility analysis (the 1447) rather than the item analysis (the 1446).

NOTE: Only one set of cards designating category codes "1", "5", "6" or "7" can be used with each item data set; only one set of cards designating category codes "2", "3", "8" or "9" can be used for each facility assigned to a specific item; there is no limit to the number of footnote card sets using category code "4". Footnotes using keycodes 1-5 or 8-9 are formulated by the key data specialist. Additionally, two other codes are presently used in column 18 to designate special footnotes automatically inserted or deleted from the master file by the APBA programs. Unless the data specialist desires to alter the computer-generated footnotes, these will remain unchanged throughout the allocation process. The additional key codes used or added by the APBA system programmer are:

Table A-11. (Cont'd)

Card Column(s)	Data Entry
	<p>"6" Hot-base (current production rate) footnote added or deleted by the PBAREQ program, as applicable (this type of footnote is currently suppressed because it is not wanted in the base retention study. To restore this footnote, PBAREQ/Source deck cards must be changed from comment cards to instruction cards).</p> <p>"7" Critical component data footnotes added or deleted by the PBACOM program, as applicable.</p>
19	<p><u>Footnote Start/Continuation Indicator:</u> If the N1 card formulated corresponds to the start of a new footnote, enter the digit "1"; if the card is a continuation of a previous footnote, leave blank.</p>
20-75	<p><u>Footnote Entry:</u> Enter the footnote information in the following manner: if the entry corresponds to the left (first) half of the footnote line, use all available spaces; if the entry corresponds to the right (second) half of a line, either end with a complete word or number and leave the remaining spaces blank or hyphenate the last word so as not to exceed the available space. Do not end with a partial number or incomplete word as the next footnote card will be printed as the left half of the next line. If no entry, leave blank.</p>
76	Blank.
77-78	<p><u>Footnote Card Number:</u> Each footnote card used in an item data set is numbered sequentially, in order of usage. Enter the digits "01" for the first card, "02" for the second, etc.</p>
79	Blank.
80	<p><u>Following Card Indicator:</u> Indicate the type of footnote card that will follow the present card, using the procedure outlined below:</p> <p>Blank If no additional N1 cards are used for the item.</p> <p>"1" If the following N1 card corresponds to the</p>

Table A-11. (Cont'd)

Card Column(s)	Data Entry
----------------	------------

left (first) half of a footnote line.

"2" If the following N1 card corresponds to the right (second) half of a footnote line.

END-ITEM AND COMPONENT-BREAKDOWN DATA: E1-E5-CARDS

E-TYPE CARD SUMMARY

A-12. The E1-E5 series of data cards lists the type and quantity of components necessary to assemble each end item or loaded component. The type of E-card included in a given item data set is dependent upon the planned utilization or production characteristics of the item or its components. E1 cards are used in the data set of a component that limits the production of one or more end items. (This component data set is termed a "pacer" data set.) E2 cards are used to identify all nonpacing components and the corresponding procurement factors necessary to produce one item. An E3 card is used in standard end-item and component data sets to designate the component that limits the production of the item. (If the end-item LAP operation limits end item production, no E3 card is used; all standard component data sets use an E3 card as these are end-item paced.) An E4 card is a special adaptation of the E2 card that represents a separate issue fuze that is used to produce another end item. (Each E4 card represents a complete and loaded fuze, consisting of the MPTS, P&E, and fuze LAP, and is used in lieu of several individual E2 cards to denote each component of the fuze.) The E5 card is used only with a separate-issue-fuze data set (deck(s) and shows the fuze is issued as an end item only after all requirements for its used as a component have been satisfied.

A-13. The data specialist must exercise extreme care in formulating the E1-E5 cards for each data set, as errors in these component cards will result in incorrect component requirements and an invalid analysis of the production base. E1-E5 cards are formulated only for those components that are included in mobilization production planning. Specific rules to be used in setting up E cards are given below. These rules have been simplified for ease of use and to assure uniformity in preparation of these cards.

A-14. Rules for E Cards. NPACE is the item schedule number in columns 22-26 of the E card.

a. For each pacer include one E1 card with npace=the pacer schedule number.

b. For each end item which is not a separate issue and which is paced, include one E3 card with npace=the pacer schedule number (if

end item is unpaced simply omit the E3 card).

c. For each end item which has components, include an E2 card for each component with npace=the schedule number of the component, and with the production factor=the number of components which must be produced to produce one end item.

d. For each end item which is a separate issue item, two data sets must be loaded, one in deck 6 and one in deck 8.

e. In deck 6 (marked by no dash in column 3) insert an E5 card with npace=the fuze metal-part schedule number and the production factor=the number of metal parts required for each separate issue fuze.

f. In deck 8 (marked by a dash in column 3) insert an E3 card with npace=the fuze metal-part schedule number and a production factor of 1.0. Also, include an E2 card for each component except the fuze metal part with npace=the schedule number of the component and with the production factor=the number of components which must be produced to produce one separate issue fuze.

g. For prime items, that is, fuze metal parts which will be used for a separate issue fuze include one E3 card with npace=the fuze metal-part schedule number and the factor=1.0. Then, include one E2 card with npace=the separate-issue-fuze schedule number and with the production factor=the number of fuze metal parts which must be produced for each separate issue fuze needed.

h. For all components except pacers and prime items, include one E3 card with npace=the component schedule number and the factor=1.0.

i. For those components which include a subcomponent not listed in an end-item E2 card (e.g., Comp B) include an E2 card for each subcomponent (e.g., RDX & TNT) with npace=the subcomponent schedule number and the production factor=the pounds of subcomponent needed to produce one pound of the major component.

PACER DATA SET COMPONENT CARD: E1 CARD

CONTENT SUMMARY

A-15. An E1 card is the only E-type card used in a pacer-component data set. It is used as the last card in the data set and indicates the end of the pacer data set. (No D1 card is used with the pacer data set.) Only one pacer may be specified for each end item although the same pacer may limit the production of several different end items.

Table A-12. E1 Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type:</u> Enter "E1".
3	Blank.
4-8	<u>Pacer Schedule Number:</u> Enter the schedule number of the pacer using right justification.
9-12	Blank.
13-20	<u>Procurement Factor:</u> Enter "1.000000".
21	Blank.
22-26	<u>Pacer Schedule Number:</u> Same as card columns 4-8.
27-29	Blank.
30-77	<u>Pacer Nomenclature:</u> Enter the nomenclature of the pacing component, using standard abbreviations as possible.
78-80	Blank.

STANDARD COMPONENT DATA CARD: E2 CARD

CONTENT SUMMARY

A-16. An E2 card is used to represent each standard component or subcomponent that is required for end-item production and included in mobilization production planning. (See Discussion of component breakdown data in section 3.1.3). The number of E2 cards in each end-item data set depends upon the number of base components or subcomponents are required to produce the end item. If no standard components or subcomponents are necessary to produce an end item, that end-item data set would not include E2 cards.

Table A-13. E2-Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type:</u> Enter "E2".
3	Blank (Dash in deck 8).
4-8	<u>Schedule Number:</u> Enter the schedule number of the end

Table A-13. (Cont'd)

Card Column(s)	Data Entry
	item (or component) for which a component (or subcomponent) breakdown is specified. Use right justification. (card column 4 is blank when using complete end-item-component breakdown procedure; column 4 is used only with component-subcomponent breakdown procedure).
9	Blank.
10-20	<u>Procurement Factor:</u> Enter the quantity of the component (or subcomponent) specified in card columns 22-26 that is required to produce one end item (or component) specified in card columns 4-8. Enter the procurement factor with a decimal point in card column 14; leave unused spaces blank, e.g., "1.02" or ".00851" or "473" etc.
21	Blank.
22-26	<u>Constituent Part Schedule Number:</u> Enter the schedule number of the component (or subcomponent) that is required to produce the end item (or component) specified in card columns 4-8. (Refer to Appendix C for schedule numbers of minor components that are consolidated into groups of related components.)
27-28	Blank.
29	<u>Component Footnote Indicator:</u> If the component is not to be listed in the critical-component data footnotes created for each end-item data set in the PBACOM program, enter the digit "1" in card column 29. Otherwise, leave blank (and a footnote will be created for the component in whichever end items it is used.)
30-77	<u>Constituent Part Nomenclature:</u> Enter the nomenclature of the component (or subcomponent) specified in card columns 22-26. Use standard abbreviations when possible.
78-80	Blank.

LIMITING-COMPONENT DATA CARD: E3 CARD

CONTENT SUMMARY

A-17. An E3 card is used in an end item data set to specify the

limiting component of that item. In the case of an end item, the E3 card identifies a component that is not available in the quantity required to meet the stated end-item LAP capability at some time prior to P-Day. If the availability of two or more components limit the possible end-item production, specify that component that most limits end-item production, as only one E3 card per data set is used. If all components are available in the quantity required for end item LAP from M+1 through M+24, no E3 card is used as end item production is then dependent upon the end-item LAP capability. Each standard-component data set uses an E3 card to indicate the availability of that component is limited by the production of the end items utilizing that component. The E3 card, if used, will always be listed as the first E-type card in a data set.

Table A-14. E3-Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type</u> : Enter "E3".
3	Blank (Dash in deck 8).
4-8	<u>Schedule Number</u> : Enter the schedule numbers of the item that has its production limited by the availability of the item specified in card columns 22-26 below. (Card column 4 is left blank when formulating an end item E3 card).
9-12	Blank.
13-20	<u>Limiting Component Procurement Factor</u> : Enter the quantity of the limiting component (pacer) required to produce one end item (or component; if a component set). Enter this factor using a decimal point in card column 14; leave unused spaces blank, e.g., "1.02" or "1".
21	Blank.
22-26	<u>Limiting-Component Schedule Number</u> : For end items, enter the schedule number of the limiting component. For components, enter the same numbers entered in columns 4-8.
27-29	Blank.
30-77	<u>Limiting-Component Nomenclature</u> : Enter the component nomenclature for the component whose schedule number is entered in columns 22-26.
78-80	Blank.

SEPARATE-ISSUE-FUZE COMPONENT BREAKDOWN: E4 CARD

CONTENT SUMMARY

A-18. The E4 card is not currently used in the PBA master data tape. The current practice is for each end item to use E2 cards for the fuze, and for all subcomponents of the fuze. An E4 card is designed to be used in an end-item data set if the end item uses a separate issue fuze as a component, and the E4 card is to represent the entire separate issue fuze (and all its components) and replaces the series of E2 cards for each fuze component that would otherwise be required. (Fuzes that are used only as components or issued only as bulk end items, i.e., fuzes that are not separate issue fuzes, follow the standard component breakdown procedure and require one E2 card for each fuze component.)

Table A-15. E4-Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type:</u> Enter "E4".
3-4	Blank.
5-8	<u>End-Item Schedule Number:</u> Enter the schedule number of the end item in which a separate issue fuze is required as a component.
9-12	Blank.
13-16	<u>Separate-Issue-Fuze Procurement Factor:</u> Enter the procurement factor corresponding to the number of principal fuze metal parts (prime items) required to produce one separate issue fuze for use with the end item, e.g., "1.02" or "1.05", etc. The decimal will be entered in card column 14.
17-21	Blank.
22-26	<u>Separate-Issue-Fuze Body Schedule Number:</u> Enter the five-digit schedule number of the principal metal part (prime item or fuze body) of the separate issue fuze.
27-29	Blank.
30-77	<u>Separate-Issue-Fuze Nomenclature:</u> Enter the nomenclature for the separate issue fuze used as a component in the end item.
78-80	Blank.

SEPARATE-ISSUE-FUZE LOADER CARD: E5 CARD

CONTENT SUMMARY

A-20. An E5 card is used only with a separate-issue-fuze loader data set (data deck 6). It is the only E-type card used in the data set and indicates the end of the data set (no D1 card is required). This E5 card identifies the fuze as a separate issue fuze and specifies issue of that fuze as an end item. Only three such data sets are used in the present APBA data tape.

Table A-16. E5-Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type:</u> Enter "E5".
3-4	Blank.
5-8	<u>Separate-Issue-Fuze Schedule Number:</u> Enter the schedule number of the separate issue fuze.
9-12	Blank.
13-16	<u>Separate-Issue-Fuze Procurement Factor:</u> Enter the procurement factor corresponding to the number of principal fuze metal parts (prime items - usually the fuze body) required to produce one fuze, e.g., "1.02", "1.05" etc. Enter the decimal point in card column 14.
17-21	Blank.
22-26	<u>Separate-Issue-Fuze-Body Schedule Number:</u> Enter the schedule numbers of the principal metal part (the fuze body; also called the "prime item") of the separate issue fuze.
27-29	Blank.
30-77	<u>Separate-Issue-Fuze Nomenclature:</u> Enter the nomenclature of the fuze, using standard abbreviations when possible.
78-80	Blank.

STANDARD DATA-SET TERMINUS MARKER: D1 CARD

CONTENT SUMMARY

A-21. A D1 card is included as the last card in each standard end-item

and component data set to mark the end of that data set. (The D1 card is not used with pacer or separate-issue-fuze-loader data sets, which use an E1 and an E5 card respectively to mark the end of the data.) If a D1 card is not the last card of a standard data set, the APBA system will not operate.

Table A-17. D1 Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type</u> : Enter "D1".
3	Blank.
4-8	<u>Schedule Number</u> : Enter the schedule number of the end item or component for which the D1 card marks the end of the data set. Use right justification.
9-29	Blank.
30-80	No entry is required, but if desired, any entry may be included. The entry will be included in the master data tape, but will be ignored in all PBA programs.

APPENDIX B
SPECIAL - PURPOSE DATA CARD FORMATS

Next page is blank.

APPENDIX B

SPECIAL-PURPOSE DATA CARD FORMATS

SUMMARY

B-1. This appendix details the data content and format specification for each type of special-purpose data card and the modification of two standard data cards for special applications in the APBA system. Examples of each card type are included after the format specifications for that card. The standard production-acceleration curves, utilized by ARMCOM to compute the production response of each facility from a hot or cold base, are included at the end of this appendix.

Table B-1. Special-Purpose Data Card Index

Card Type	Page
Last B3 Card	83
Last N2 Card	84
G1-G2 Card Summary	84
G-1 Card	85
G-2 Card	86
U Card Summary	87
U Card Format	88

SPECIALLY MODIFIED STANDARD DATA CARDS: LAST B3 and N2 CARDS

CONTENT SUMMARY

B-2. Two standard data cards are specially modified to mark the end of the facility data group and the facility remarks group. The last B3 card in the facility data group (deck 1) is modified to mark the end of that group and a special N2 card is added to the facility remarks group (deck 2) to mark its end. The absence of either of these cards in the final data tape will prevent APBA system operation.

Table B-2. Last B3-Card Format Specification

Card Column(s)	Data Entry
1-79	Same entry as specified in Appendix A; this entry corresponds to the B3 card of the last facility in the facility data group.

Table B-2. (Cont'd)

Card Column(s)	Data Entry
80	Enter the digit "1" to indicate the end of the facility data.

Table B-3. Last N2-Card Format Specification

Card Column(s)	Data Entry
1-2	Enter "N2".
3-80	Blank (insert this card after the last N2 card that contains facility remarks data).

NONSTANDARD PRODUCTION GOALS: G1 & G2 CARDS

CONTENT SUMMARY

B-3. The PBS program automatically establishes a production goal for each planned production facility such that the quantity of each item produced at $M + 24$ equals the requirement for that item at $M + 24$, i.e., the planned production of each item equals the stated requirements for that item at $M + 24$. Facilities that are not utilized (to satisfy the stated mobilization requirements) are assigned a zero production goal and identified as excess to the production base required to meet the stated mobilization requirements. The standard production-goal assignment procedures employed by the PBAPBS program are as follows:

a. A facility production goal must equal or exceed the facility minimum sustaining rate. (Exception: if the total requirement for an item is less than the MSR of the first planned producer, i.e., the highest retention priority facility, that facility is assigned a production goal equal to the total item requirement.)

b. Facility production goals are assigned in order of the facility priority of retention, beginning with the highest retention priority. (Active or "hot" facilities are assigned a higher retention priority than inactive or "cold" facilities.)

c. Each facility is assigned a production goal equal to its maximum capacity, unless the resultant production exceeds the total item requirement, i.e., a production goal is not assigned to a lower retention priority facility unless all facilities with a higher retention priority are utilized at maximum capacity. In this case, the last producer is assigned a nonzero production goal equal to the difference between the sum of the production goals for all higher retention priority facilities and the total requirement for the item at $M + 24$. If all assigned facilities are utilized at maximum capacity and additional production is

still required, the PBS program will create an M-day action facility with a production goal equal to the remaining production capability that is required.

d. The sum of the facility production goals for each item will equal the sum of the mobilization requirements for that item at $M + 24$. Nonstandard production-goal cards (G1 & G2 cards) are used in an item data set to override these standard production-goal procedures for specific items. These goal cards need only be employed where a facility, other than the last planned producer of an item, is utilized at less than maximum capacity. (The PBS program automatically limits the last planned producer to the amount required to satisfy item requirements.) Operation of a facility at less than maximum capacity allows a facility of lower retention priority to be utilized and may reflect a reduction in the maximum capacity applicable to one item due to the planned production of an additional item. Two cards are required to establish nonstandard production goals for each data set: A G1 card, which contains space for the production goals of facilities 1-9, and a G2 card, which contains space for the production goals of facilities 10-18. (One G1 and one G2 card are used with each data set, regardless of the number of assigned facilities; unassigned facility goals are left blank by the user and read by the program as zero goals.) Additionally, the A1 card of the item data set must include a G-card indicator (see Appendix A).

NONSTANDARD PRODUCTION GOALS (FACILITIES 1-9): G1 CARD

Table B-4. G1 Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type</u> : Enter "G1".
3	Blank (Dash in deck 8).
4-8	<u>Schedule Number</u> : Enter the schedule number of the end item or component for which nonstandard production goals are desired.
9	Blank.
10-16	<u>Facility No. 1 Production Goal</u> : Enter the desired production goal, using a decimal point based on the unit of measure specified in card column 80, e.g., "101.", "5384.", etc. If the facility is planned for utilization at the MAX rate, enter that; if the facility is planned for utilization at less than the MAX rate, but it is the last active (at $M + 24$) facility, again enter the MAX rate. Otherwise, enter the designated production goal.

Table B-4. (Cont'd)

Card Column(s)	Data Entry
17-23	<u>Facility No. 2 Production Goal:</u> Use the same procedure as for facility no. 1 except if no facility is assigned, leave the production goal blank.
24-30	<u>Facility No. 3 Production Goal:</u> Same as Fac. No. 2.
31-37	<u>Facility No. 4 Production Goal:</u> Same as Fac. No. 2.
38-44	<u>Facility No. 5 Production Goal:</u> Same as Fac. No. 2.
45-51	<u>Facility No. 6 Production Goal:</u> Same as Fac. No. 2.
52-58	<u>Facility No. 7 Production Goal:</u> Same as Fac. No. 2.
59-65	<u>Facility No. 8 Production Goal:</u> Same as Fac. No. 2.
66-72	<u>Facility No. 9 Production Goal:</u> Same as Fac. No. 2.
73-79	Blank.
80	<u>Unit of Measure:</u> Enter a letter designating the quantitative unit of production as follows: "E" for each. "K" for thousands. "M" for millions.

NONSTANDARD PRODUCTION GOALS (FACILITIES 10-18): G2 CARD

Table B-5. G-2-Card Format Specification

Card Column(s)	Data Entry
1-2	<u>Card Type:</u> Enter "G2"
3-80	The remaining formats and data entries are the same as on the G1 card, except the production goals are now utilized for facilities 10-18 rather than 1-9. <u>NOTE:</u> A G2 card is required for each G1 card used; however, if there are no assigned facilities for retention priorities 10-18 inclusive, only card columns 1-8 and 80 need be completed.

NONSTANDARD PRODUCTION ACCELERATION RATES: U CARDS

CONTENT SUMMARY

B-4. After the assignment of a production goal to each facility, the PBAPBS program develops a production schedule that reflects the utilization and response of each facility over the post M-day planning period. Formulation of this schedule requires the following data for each facility: The production rate at M-1, the production leadtime, priority of retention, and the assigned production goal. This information is then used to enter a standard production-acceleration table to project the response of the facility. (Standard production-acceleration tables for different types of facilities, starting from a hot or cold base, are attached at Tables B-7 and B-8 respectively.) These tables are used primarily to project the response of end item LAP and metal parts facilities. Other production facilities, however, principally producers of propellants and explosive, utilize a different production-acceleration rate.

B-5. In order to project the nonstandard production behavior of these facilities, special nonstandard production-acceleration cards are appended to the basic facility-production capability card (C1) to override the use of the standard production-acceleration tables. That is, a single U card or series of U cards, containing the special production-acceleration data desired, is inserted into an item data set immediately following the C1 card representing the facility that will not follow standard production procedures.

B-6. The production capability data entered on the C1 card is printed in Section III of the automated AMC Form 1446, but the data entered on the U card overrides the C1 capability data and the standard production-acceleration rate data to reflect the desired (nonstandard) planned-production data printed in Section IV of the automated AMC Form 1446.

B-7. U cards are generally utilized to indicate the special buildup rates applicable to the production of propellants and explosives, e.g. 1/3, 2/3, 3/3 of the maximum capacity rather than 5%, 15%, etc. However, U cards are also employed to represent the following uncommon production situations:

a. Specify the buildup rates to be used for individual production lines within a multiline plant.

b. Represent a "double buildup" phenomenon, that is, the production of a facility at one rate shortly after mobilization, maintenance of that rate for several months, with the facility later building to a higher rate that is subsequently maintained through M + 24.

c. Indicate the interim utilization of a facility to produce an item where another facility has primary production-planning responsibility, i.e. the facility produces an item in the initial months after

mobilization, to meet temporary shortages, and is subsequently reassigned production of a different item or deactivated, such that no production of the original item by the original facility is forthcoming at M + 24.

d. Specify a particular (nonstandard) cold-base production-buildup rate that is not readily obtainable using the standard cold-base production-acceleration tables.

B-8. The various specific production situations for which the U card may be used are indicated in Table B-6 under the entry for column 19.

B-9. Since the data entered on the U cards are based on specific C1 cards, any change in the production capability or leadtime data entered on the C1 card, will usually necessitate revision of the U card data. This is accomplished using the UPDAT program, generally during the facility reallocation/reassignment process which occurs after a new end-item/component requirements base has been generated by the PBAREQ program.

Table B-6. U-Card Format Specification

Card Column(s)	Data Entry
1	<u>Card Type</u> : Enter "U".
2-3	<u>Facility Priority of Retention</u> : Enter two digits, corresponding to the retention priority of the facility that will not follow standard production-buildup procedures. If less than ten, use "01", "03", etc. In Deck 8, a dash is required in column 3, therefore, in that deck the card must be multipunched with the dash and the proper numeral. In listing the deck, this multipunching will result in the following symbols: $\overline{1}$ = A, $\overline{2}$ = B, $\overline{3}$ = C, $\overline{4}$ = D, $\overline{5}$ = E, $\overline{6}$ = F, $\overline{7}$ = G, $\overline{8}$ = H, and $\overline{9}$ = I.
4-8	<u>Schedule Number</u> : Enter the schedule number of the end item or component for which nonstandard buildup is desired. Use right justification.
9-14	<u>Plant Index Number/Temporary Production Rate</u> : If the facility is scheduled for production at M-24, enter the six-digit plant index number; if the facility is utilized only temporarily and is not scheduled to produce at M-24, enter the digit '5' in column 19 and enter the highest production rate attained between M-1 and M-23. Use right justification. Do not use decimals.
15-16	<u>Total Number of Production Lines</u> : Enter the total

Table B-6. (Cont'd)

Card Column(s)	Data Entry
	<p>number of production lines being considered separately within a single facility, e.g. "1", "2", "11", etc. Use right justification. This number will also equal the number of U cards which are associated with the C1 card.</p>
17-18	<p><u>Individual Line Number:</u> Enter the number of the individual line being considered. (Each separate line requires one U card containing the data on that line.) Line 1 = "1", line 2 = "2", etc. Use right justification. The last U card associated with a given C1 card must have the same value in columns 15-16 and 17-18.</p>
19	<p><u>Production Buildup Indicator:</u> Enter "1" if typical propellant & explosive buildup rate is to be used. Enter "2" if the standard "Ritter" buildup values are to be used. Enter "0" if a special buildup rate is given in columns 32-79. If the entries in columns 32-79 are buildup values for a temporarily used facility which is not used in M + 24, enter "5" in column 19, and be sure to enter the maximum utilization rather than the plant index number in columns 9-14.</p>
20-21	<p><u>Production Leadtime:</u> For temporary producers, leave blank; if this is the first U card for a facility, leave blank (leadtime will be taken from the C1 card); succeeding U cards will have a leadtime entry automatically assigned as one month greater than the leadtime for the previous U card unless a different number is entered in the field, e.g. if the first U-card leadtime is "05", as taken from the C1 card, the next is assigned "06" unless overridden by the entry of another number.</p>
22	<p><u>Unit of Measure:</u> Enter a letter designating the quantitative production units for the maximum production capacity entered in card column 23-29 as follows:</p> <p>"E" for units of Each</p> <p>"K" for units of Thousands</p> <p>"M" for units of Millions.</p>

Table B-6. (Cont'd)

Card Column(s)	Data Entry
23-29	<p><u>Maximum Production Capacity:</u> For temporary facilities, leave blank (max capacity is entered in card column 9-14); for all other facilities, enter the maximum production rate for the line (or facility) represented. Use a decimal point. Do not exceed the allowable entry of six digits and a decimal point.</p>
30-31	<p><u>Hot-Base Activity Indicator:</u> Express the desired hot-base production activity (production rate estimated at M-1) as a percentage of the maximum capacity. Enter digits so:</p> <p><u>Zero Production:</u> leave blank</p> <p><u>1% to 99%:</u> enter "01", "23", "79", etc.</p> <p><u>100% active:</u> leave blank; enter "1" in card column 80.</p>
32-79	<p><u>Nonstandard Production Acceleration (Buildup) Rates:</u> Do not use if card column 19 has "1", "2"; otherwise, card columns 32-79 provide space for the entry of twenty-four pairs of digits, corresponding to a percentage of the maximum capacity produced for months M-1 through M-24, e.g., card columns 32 & 33 = M-1; card columns 34 & 35 = M-2; etc. Enter max capacity percentage as follows:</p> <p><u>Zero production:</u> leave blank or enter zeros</p> <p><u>1% to 99%:</u> enter "01", "13", "89", etc.</p> <p><u>100%:</u> enter the character set "-1".</p>
80	<p><u>100% Active Indicator:</u> If card columns 30-31 or 32-79 have an entry, leave blank; if the line is inactive, leave blank; if the line is active at 100% of its capacity (for all 24 months), enter "1".</p>

Table B-7 Hot-Base Production-Acceleration Rates

Mobilization capability buildup rates for end items from an operating (hot) base.
Expressed as percentages of the maximum capacity or of the planned production goal.

Month	Buildup for indicated starting rate (Starting rates given as percentage of the final production rate)								Month
	1 to 10%	11 to 20%	21 to 30%	31 to 40%	41 to 50%	51 to 65%	66 to 80%	81 to 100%	
1	start rate	start rate	start rate	start rate	start rate	start rate	start rate	start rate	1
2	start rate	start rate	start rate	start rate	start rate	start rate	start rate	start rate	2
3*	1.25 × SR	1.25 × SR	1.25 × SR	1.25 × SR	70	85	95	100	3*
4*	1.75 × SR	1.75 × SR	1.75 × SR	1.75 × SR	85	95	100	100	4*
5	40	50	70	85	95	100	100	100	5
6	50	70	85	95	100	100	100	100	6
7	70	85	95	100	100	100	100	100	7
8	85	95	100	100	100	100	100	100	8
9	95	100	100	100	100	100	100	100	9
10-24	100	100	100	100	100	100	100	100	10-24

All of the above data are reported in terms of end items. A 30-day lead time for LAP operations is included. For data on metal parts, propellants and explosives, or component LAP, all data should be moved up one month, i.e., production level for an end item in month 5 would be equal to production level for a component in month 4.

* SR in entries for months 3 and 4 indicates starting rates.

Table B-8. Cold-Base Production-Acceleration Rates

Mobilization capability buildup rates for end items from a nonoperating (cold) base.
Expressed as a percentage of the maximum capacity or of the planned production goal.

Month	lead time 90-day	Lead time 120-day	Lead time 150-day	Lead time 180-day	Lead time 360-day	M-Day Action	Month
1	0	0	0	0	0	0	1
2	0	0	0	0	0	0	2
3	0	0	0	0	0	0	3
4	0	0	0	0	0	0	4
5	5	0	0	0	0	0	5
6	15	5	0	0	0	0	6
7	30	15	5	0	0	0	7
8	50	30	15	5	0	0	8
9	80	50	30	15	0	0	9
10	100	80	50	30	0	0	10
11	100	100	80	50	0	0	11
12	100	100	100	80	0	0	12
13	100	100	100	100	0	0	13
14	100	100	100	100	5	5	14
15	100	100	100	100	15	15	15
16	100	100	100	100	30	30	16
17	100	100	100	100	50	50	17
18	100	100	100	100	80	65	18
19	100	100	100	100	100	85	19
20-24	100	100	100	100	100	100	20-24

All of the data given here are reported in terms of end items. A 30-day lead time for LAP operations is included. For data on metal parts, propellants and explosives, or component LAP, all data should be moved up one month, i.e., production for an end item in month 5 would equal production for a component in month 4.

APPENDIX C
NUMERIC DESIGNATIONS FOR SELECTED DATA

Next page is blank.

APPENDIX C

NUMERIC DESIGNATIONS FOR SELECTED DATA

C-1. This appendix contains lists of plant index numbers and schedule numbers for facilities and items not assigned standard designations in the DOD Register of Planned Emergency Procedures or in the ARMCOM End-Item and Component Master File. Additionally, as the APBA system requires a plant index number for each facility and a schedule number for each end item or component considered, arbitrary numbers were assigned as necessary for program operation.

C-2. The lists included herein are ordered as follows:

<u>Content</u>	<u>Page</u>
M-Day Actions/Nonstandard Facilities	89
Planned Producers	90
X-Facilities	92
Bulk Explosive End Items	93
Aggregate Component Groups	94
M-DAY ACTIONS/NONSTANDARD FACILITIES	

GENERAL

C-3. The APBA System requires the assignment of a plant index number (PIN) to each facility considered. Designation of plant index numbers for M-Day Action facilities allow for production deficits to be addressed by the data specialist as well as by the PBAPBS program. In instances where an organization other than ARMCOM retains final LAP responsibility, but ARMCOM must supply the component parts, the organization (Edgewood Arsenal, Department of the Navy, etc.) was assigned a PIN as if it constituted a planned producer. The PIN designations used in the December 1972 APBA data tape are as follows:

Table C-1. PIN Designations, M-Day Action

<u>Plant Index Number (PIN)</u>	<u>Nomenclature Designation</u>
996201	Department of the Navy LAP Facility
996202	Edgewood Arsenal LAP Facility
996203	Metal Parts LAP Facility (Refer to MPTS Section)

Table C-1. (Cont'd)

Plant Index Number	Nomenclature Designation
996204	Bulk-Issue P&E Facility
996205	Separate-Issue Fuze Facility
996206	M-Day-Action (ARMCOM) Assigned End-Item LAP
996207	M-Day-Action (ARMCOM) Assigned Metal Parts
996208	M-Day-Action (ARMCOM) P&E
996209	M-Day-Action (ARMCOM) Component LAP
000001	M-Day-Action (Computer) Assigned End-Item LAP
000011	M-Day-Action (Computer) Metal Parts
000051	M-Day-Action (Computer) P&E
000081	M-Day-Action (Computer) Component LAP

PLANNED PRODUCERS

C-4. Facilities assigned to produce an item after M-Day, but not listed in the DOD Register of Planned Emergency Producers, have been assigned plant index numbers as follows:

Table C-2. Facilities Unlisted in DOD Register

Plant Index Number	Facility Name & Address
996001	Canadian Commercial Corp. Canadian Industries, Ltd. Beloeil, Quebec, Canada
996010	Canadian Commercial Corp. Canadian Industries, Ltd. Valleyfield, Quebec, Canada
996024	Plashmed, Inc. Cheshire, Canada
996025	R. M. Kerner Co. Erie, Pa.
997001	Pine Bluff Arsenal Fac. No. 3, Bldg. 31-540 Pine Bluff, AR 71601

Table C-2. (Cont'd)

Plant Index Number	Facility Name & Address
997002	Pine Bluff Arsenal Fac. Nos. 5 & 21, Bldg. 31-630 Pine Bluff, AR 71601
997003	Pine Bluff Arsenal Fac. No. 6, Bldg. 33-630 Pine Bluff, AR 71601
997004	Pine Bluff Arsenal Fac. No. 7, Bldg. 33-530 Pine Bluff, AR 71601
997005	Pine Bluff Arsenal Fac. No. 12, Bldg. 34-110 Pine Bluff, AR 71601
997006	Pine Bluff Arsenal Fac. No. 12, Bldg. 34-110 Pine Bluff, AR 71601
997007	Pine Bluff Arsenal Fac. No. Bldg. 34-350 Pine Bluff, AR 71601
997008	Pine Bluff Arsenal Fac. No. 16, Bldg. 44-110 Pine Bluff, AR 71601
997009	Rocky Mountain Arsenal Bldg. 1601, Lines 1 & 2 Denver, CO 80240
997010	Rocky Mountain Arsenal Bldg. 1501, North, South, & Ctr Bay Denver, CO 80240
997011	Rocky Mountain Arsenal Bldg. 1601, Lines 3 & 4 Denver, CO 80240
997012	Rocky Mountain Arsenal Bldg. 314 Denver, CO 80240
997015	All-Bann Enterprises 237-DN. Euclid St. Anaheim, CA 92801

Table C-2. (Cont'd)

Plant Index Number	Facility Name & Address
997050	Pine Bluff Arsenal Fac. No. 9, Bldg. 34-630 Pine Bluff, AR 71601
997051	Pine Bluff Arsenal Bldg. 33-540 Pine Bluff, AR 71601
997052	Pine Bluff Arsenal Bldg. 32-570 Pine Bluff, AR 71601
997053	Pine Bluff Arsenal Bldg. 34-135 Pine Bluff, AR 71601
997055	(To be planned)
998001	GOCO (To be selected)
998005	DuPont, E. I., Co. Inc. Potomac River Works Falling Waters, W. VA.
998014	Elroy Manufacturing Co. 17 Liberty St. Glassboro, NJ 08028
998015	Grismac Corp. 519 S. Delaware Ave. Indianapolis, IN 46205

X-FACILITIES

C-4. An "X-Facility" corresponds to the ASOD package (Government-owned equipment) that was assigned to a planned producer in order to produce a specific item or group of items and the facility was subsequently eliminated from industrial readiness planning. The equipment is temporarily reassigned to an "X" or unknown facility, pending contractual arrangements (DD Form 1519) with a new producer.

C-5. The "X-Facilities" included in the December 1972 APBA data tape are listed below.

Table C-3. Facilities that Will Not Be Used in the Future

Plant Index Number	X-Facility Designation
996100	Metal Parts Facility (to be selected)
996101	Formerly Dunham-Bush, Inc.
996102	Formerly Johnson Furnace Co.
996106	Formerly Whirlpool Corp.
996108	Formerly Deere and Company
996109	Formerly Eisen Bros. Inc.
996110	Formerly Gulf & Western, Univ. Amer. Co.
996111	Formerly Lear Siegler, Inc., Power Equip. Div.
996113	Formerly Pullman, Inc.
996114	Formerly Delta Southern Co.
996116	Formerly Maytag Co., Plt. No. 1
996118	Formerly Roper Corp. Newark Div. Newark, OH
996119	Formerly Rulon Co. Chicago, IL
996121	Formerly Zenith Radio Corp. Plant No. 2 Chicago, IL
996130	X-Facility (to be selected)
998016	X-Facility (formerly Olin-New Haven)

BULK ISSUE ITEMS

C-6. Bulk issue items are components for which ARMCOM has production responsibility but not LAP responsibility. These are other service requirements (Department of the Navy and Department of the Air Force) which are required in addition to the component requirements derived from the stated end-item requirements. Inclusion of these requirements within the current APBA system has required consideration of these bulk issue requirements as a special type of end item. The data sets for these items are inserted in the hot- or cold-base end-item deck, as applicable, with

item schedule numbers assigned as follows:

Table C-4. Bulk Issue Items

<u>Schedule Number</u>	<u>Bulk-Issue Item Nomenclature</u>
4060	Black Powder Potassium Nitrate
5195	Composition A-3
5210	Composition B
5255	Composition CXM-1
5360	Cyclotol 70/30
5965	Explosive D
7500	HMX
7915	Octol 75/25
7933	PBX N-5
8118	Propellant, Single Base, NACO
8230	Propellant, Solventless, Rocket, N5
8235	Propellant, Solventless, Rocket, N8
9605	Tetryl
9620	Trinitrotoluene (TNT)

AGGREGATE COMPONENT GROUPS

GENERAL

C-7. The ARMCOM Base Retention Study contains aggregate component groups which are a rollup of similar yet discrete components specified in the ARMCOM End-Item and Component Master File. In order for the ABRS System to provide a similar rollup of related items, each of the constituent components must reference the schedule number assigned to the aggregate group rather than the schedule number of each discrete part. A summary of the aggregate groups (component rollups) and a breakdown of the individual components within a group is as follows:

Table C-5. Aggregate Component Groups

<u>Aggregate Schedule Number</u>	<u>Rollup Nomenclature</u>
11989	Case, Cart, 105mm, M14 series

Table C-5. (Cont'd)

<u>Aggregate Schedule Number</u>	<u>Rollup Nomenclature</u>
12874	Container, Fiber (all types)
57343	Propellant, Single Base (all types)
57350	Propellant, Double & Triple Base (all types)
57360	Propellant, Solventless Rocket (all types)
80005	Activators, Mine (all types)
80535	Booster, Artillery (all types)
82310	Charge, Burster (all types)
82790	Container, Assy, F/select ammunition
84100	Detonators, Primers & Relays (all types)
84900	Fuze, Artillery, Point Detonating (all types)
84950	Fuze, Artillery, Time (all types)
85305	Fuze, Rocket, 2.75-in. (all types)
86290	Initiator, Burster (all types)
87190	Primer, Percussion, Elements (all types)
87194	Primer, Percussion, Mortar (all types)
89410	Tracers (all types)

Table C-6. Individual Component Listing for Aggregate Component Groups

<u>Group schedule number 11989</u>	<u>Nomenclature: Case, Cart, M14 Series, 105mm</u>
<u>Component schedule numbers</u>	<u>Component nomenclature</u>
11985	Case, Cart, M14B1, 105mm
11989	Case, Cart, M14B4, 105mm
<u>Group schedule number 12874</u>	<u>Nomenclature: Containers, Fiber (All Types)</u>
<u>Component schedule numbers</u>	<u>Component nomenclature</u>
12855	Container, Fiber, M53A3
12863	Container, Fiber, M79A2

Table C-6. (Cont'd)

<u>Component schedule numbers</u>	<u>Component nomenclature</u>
12874	Container, Fiber, M105A3
12929	Container, Fiber, M180A1
12961	Container, Fiber, M251A1
12984	Container, Fiber, M278
12990	Container, Fiber, M280
13007	Container, Fiber, M294
13010	Container, Fiber, M295
13029	Container, Fiber, M314
13033	Container, Fiber, M316
13075	Container, Fiber, M387
13087	Container, Fiber, M411
13090	Container, Fiber, M412
13093	Container, Fiber, M413
13108	Container, Fiber, M422
13115	Container, Fiber, M431
13120	Container, Fiber, M435
13132	Container, Fiber, M451
13144	Container, Fiber, M512
13149	Container, Fiber, M516
13165	Container, Fiber, M565
13180	Container, Fiber, M580
13183	Container, Fiber, F/Cart XM581
<u>Group Schedule Number 57343</u>	<u>Propellant, Single Base (All Types)</u>
<u>Schedule Number</u>	<u>Nomenclature</u>
57343	Propellant, Single Base, M1 (NLT)

Table C-6. (Cont'd)

<u>Schedule number</u>	<u>Nomenclature</u>
57347	Propellant, Single Base, M1 (30LT)
57384	Propellant, Single Base, M10
57363	Propellant, Single Base, M6 (NLT)
59350	Propellant, Single Base, M1 (NLT)
57386	Propellant, Single Base, NACO, Navy
57455	Propellant, Single Base, IMR 4475
57459	Propellant, Single Base, IMR 4879
57463	Propellant, Single Base, IMR 4895
57467	Propellant, Single Base, IMR 5010
57471	Propellant, Single Base, IMR 7383
57475	Propellant, Single Base, IMR 8261
Group schedule number 57350	Propellant, Double and Triple Base, (All Types)
<u>Schedule number</u>	<u>Nomenclature</u>
57350	Propellant, Double Base, M2
57357	Propellant, Double Base, M5
57378	Propellant, Double Base, M9
57411	Propellant, Double Base, M26
57415	Propellant, Double Base, M26E1 (T28E1)
57422	Propellant, Triple Base, M30
57431	Propellant, Triple Base, M31
57369	Propellant, Solvent, Rocket, M7
57370	Propellant, Solvent, Rocket, M7 (Modified)
Group schedule number 57360	Propellant, Solventless, Rocket (All Types)
<u>Schedule number</u>	<u>Nomenclature</u>
57360	Propellant, Solventless, Rocket, N5

Table C-6. (Cont'd)

<u>Schedule Number</u>	<u>Nomenclature</u>
57375	Propellant, Solventless, Rocket, N8
<u>Group schedule number 80005</u>	<u>Activators, Mine (All Types)</u>
<u>Schedule number</u>	<u>Nomenclature</u>
80003	Activator, At Mine, M1
80009	Activator, M2 (T3E1)
<u>Group schedule number 80535</u>	<u>Booster, Artillery (All Types)</u>
<u>Schedule number</u>	<u>Nomenclature</u>
80532	Booster, M25
80550	Booster, M125A1
82670	Booster, M25A1
<u>Group schedule number 82310</u>	<u>Charge, Bursters, (All Types)</u>
<u>Schedule number</u>	<u>Nomenclature</u>
82290	Charge, Burster, M19
82304	Charge, Burster, M24
82321	Charge, Burster, M35 (T-74)
82338	Charge, Burster, M41
82350	Charge, Burster, M47
82353	Charge, Burster, M48
82362	Charge, Burster, M53
82366	Charge, Burster, XM54
82423	Charge, Burster, F/2.75-in. RKT.
<u>Group schedule number 82790</u>	<u>Container, Assy, F/Select Ammunition</u>
<u>Schedule number</u>	<u>Nomenclature</u>
82787	Container, Assy. F/CC No. 2
82792	Container, Assy, F/CC No. 7

Table C-6. (Cont'd)

<u>Group schedule number 84100</u>	<u>Detonators, Primers, Relays(All Types)</u>
<u>Schedule number</u>	<u>Nomenclature</u>
83890	Delay, Det. Assy, F/M21 Mine
83944	Delay, Det. Assy, F/CC No. 2
83949	Delay, Det. Assy, F/CC No. 7
83980	Delay, Detonator, F/Fuze M536
87208	Primer, Elec, XM91E1, COMBUS
87212	Primer, Perc, XM92
87220	Primer, Perc, M96 (T79)
87233	Primer, Perc, XM100
<u>Group schedule number 87192</u>	<u>Primer, Percussion Elements (All Types)</u>
<u>Schedule number</u>	<u>Nomenclature</u>
87093	Primer, Perc, M61
87115	Primer, Perc, M54
<u>Group schedule number 87194</u>	<u>Primer, Percussion, Mortar (All Types)</u>
<u>Schedule number</u>	<u>Nomenclature</u>
87028	Primer, Perc, M32
87150	Primer, Perc, M71A1
<u>Group schedule number 89410</u>	<u>Tracers, (All Types)</u>
<u>Schedule number</u>	<u>Nomenclature</u>
89385	Tracer, M5A1B1
89393	Tracer, M5A3B1
89400	Tracer, XM10
89404	Tracer, M11
89408	Tracer, M12
89412	Tracer, M13
83990	Delay, Detonator, F/M16, Mine

Table C-6. (Cont'd)

<u>Schedule number</u>	<u>Nomenclature</u>
84108	Detonator, M17
84111	Detonator, M18
84137	Detonator, M24
84145	Detonator, M29
84151	Detonator, M31A1
84157	Detonator, M35
84170	Detonator, M41
84179	Detonator, M44
84184	Detonator, M45
84188	Detonator, M46
84192	Detonator, M47
84197	Detonator, Electric M48 (T18E4)
84206	Detonator, M49
84216	Detonator, STAB M50 (T36)
84237	Detonator, M55
84254	Detonator, M58
84260	Detonator, M61E2
84264	Detonator, M63
84267	Detonator, Electric, XM65
84290	Detonator, M80
84298	Detonator, XM86
84301	Detonator, XM87
84314	Detonator, Assy, DWG, 8796342
86327	Lead Cup F/BLU-3B/1

Table C-6. (Cont'd)

<u>Schedule number</u>	<u>Nomenclature</u>
86337	Lead Cup Assy, F/CC No. 11 DWG 9215246
86348	Lead Cup, F/Fuze PD M533
86355	Lead Cup, F/Fuze PD M551
86369	Lead Cup Assy, DWG 65B1 2287
86376	Lead Cup Assy, DWG 8833562
87007	Primer, STAB, M26
87098	Primer, STAB, M56
87223	Primer, STAB, M96
87565	Relay, M4
87575	Relay, M7
87580	Relay, XM9
87590	Relay, M11
87606	Relay Element, DWG 9211113
87243	Primer, M104
<u>Group schedule number 84900</u>	
<u>Schedule number</u>	<u>Nomenclature</u>
84190	Fuze, PD, M48A3
85385	Fuze, PD, M521 (T247)
85485	Fuze, PD, M557
<u>Group schedule number 84950</u>	
<u>Schedule number</u>	<u>Nomenclature</u>
84943	Fuze, Time, M65A1
84968	Fuze, Time, M84A1

Table C-6. (Cont'd)

<u>Group schedule number 85305</u>		<u>Fuze, Rocket, 2.75-Inch (All Types)</u>	
<u>Schedule number</u>		<u>Nomenclature</u>	
85300		Fuze, Rocket, M423	
85310		Fuze, Rocket, M427	
<u>Group schedule number 86290</u>		<u>Initiator, Burster (All Types)</u>	
<u>Schedule number</u>		<u>Nomenclature</u>	
86289		Initiator, Burster, M2	
86297		Initiator, Burster, M13 (T7)	
<u>Group schedule number 87190</u>		<u>Primer, Percussion, Artillery (All Types)</u>	
<u>Schedule number</u>		<u>Nomenclature</u>	
86945		Primer, Perc, M1B1A2	
87018		Primer, Perc, M28B2	
87082		Primer, Perc, M49	
87102		Primer, Perc, M57	
87106		Primer, Perc, M58	
87133		Primer, Perc, Elec, M67 (T85E3)	
87172		Primer, Perc, M79	
87176		Primer, Elec, M80A1	
87188		Primer, Elec, M83E3	
87195		Primer, Elec, M86	
87204		Primer, Perc, XM90E1	

APPENDIX D

SAMPLE PAGE OF THE "DIF" OUTPUT OF THE PBAREQ PROGRAM

Next page is blank.

SAMPLE PAGE OF THE "DIF" OUTPUT OF THE PBAREQ PROGRAM

REQUIREMENT ANALYSIS FOR ITEM 15391 FUZE, PD, M524A6/M567 (T186E11)
 OLD REQUIREMENTS: INPUT FROM TAPE 0959, 76 REQUIREMENTS AS OF FEB 1976
 NEW REQUIREMENTS: OUTPUT IS ON NEW TAPE (25 FEB 76) FY76 REQ

		-----LEVEL 2-----			-----RETENTION LEVEL-----		
		OLD REQ	NEW REQ	CHANGE	OLD REQ	NEW REQ	CHANGE
MARINE CORPS REQUIREMENTS	- - - - -	186410.	186407.	-3.	272550.	272548.	-2.
NAVY REQUIREMENTS	- - - - -	5850.	5850.	0.	9300.	9300.	0.
AIR FORCE REQUIREMENTS	- - - - -	0.	0.	0.	0.	0.	0.
REQUIREMENTS FOR SELECTED ALLIES	- - - - -	919650.	919645.	-5.	919650.	919645.	-5.
NONARMY REQUIREMENTS	AMOUNT - - - - -	1111910.	1111902.	-8.	1201500.	1201493.	-7.
	PERCENT - - - - -	0.76842	0.76842	0.0	0.71460	0.71460	0.0
ARMY REQUIREMENTS	AMOUNT - - - - -	335100.	335098.	-2.	479850.	479847.	-3.
	PERCENT - - - - -	0.23158	0.23158	0.0	0.28540	0.28540	0.0
TOTAL REQUIREMENTS	- - - - -	1447010.	1447000.	-10.	1681350.	1681340.	-10.

COMPONENTS USED BY ITEM 15391 FUZE, PD, M524A6/M567 (T186E11)

NO.	NOMENCLATURE	FACTOR	OLD REQ	NEW REQ	CHANGE	OLD REQ	NEW REQ	CHANGE
50283	BLACK POWDER POTASSIUM NITRATE	0.000500	724.	724.	0.	841.	841.	0.
54331	DIMETHYLANILINE (DMA)	0.040035	57931.	57931.	0.	67313.	67312.	-1.
56324	LEAD AZIDE (DEXTRINATED)	0.000869	1257.	1257.	0.	1461.	1461.	0.
57525	RDX	0.002210	3198.	3198.	0.	3715.	3715.	0.
59350	TETRYL	0.084285	121962.	121960.	-2.	141713.	141712.	-1.
83880	DELAY M2	1.190475	1722627.	1722616.	-11.	2001603.	2001591.	-12.
84100	DETONATOR M55	3.428571	4961174.	4961141.	-33.	5764625.	5764592.	-33.
84264	DETONATOR M63	1.095238	1584819.	1584809.	-10.	1841478.	1841468.	-10.
84290	DETONATOR M80	1.095238	1584819.	1584809.	-10.	1841478.	1841468.	-10.
85391	FUZE PD M524A6 COMPONENT L/A/P	1.000000	1447010.	1447000.	-10.	1681350.	1681340.	-10.
87093	PRIMER PERC M54	1.428571	2067155.	2067141.	-14.	2401926.	2401912.	-14.
87192	PRIMER PERC M54 & M61	1.428571	2067155.	2067141.	-14.	2401926.	2401912.	-14.
87575	RELAY M7	1.238092	1791533.	1791521.	-12.	2081667.	2081655.	-12.

ITEMS USING 15391 AS A COMPONENT

NO.	NOMENCLATURE	FACTOR	OLD NEW	OLD REQ	NEW REQ	CHANGE	OLD REQ	NEW REQ	CHANGE
2174	CART., 81MM, HE, M374A2,	1.049994	0.86 0.86	1249492.	12494.2.	0.	1447941.	1447941.	0.
2223	CART, 81MM, SMK, WP, M37	1.500000	1.00 1.00	197508.	197508.	0.	233399.	233399.	0.
6790	FUZE, PD, M524AL/M567 (T	1.049994	1.00 1.00	0.	0.	0.	0.	0.	0.

CAPABILITY ANALYSIS FOR ITEM 15391

FUZE, PD, M524A6/M567 (T186E11)

CAPABILITY AT INDICATED LEAD TIMES

FACILITY	P.I.N.	NAME	M+5	M+6	M+7	M+8	M+9	M+10	M+12	M+14
1	814066	REDM CORP.	160000.	160000.	160000.	160000.	160000.	160000.	160000.	160000.
2	158430	BULOVA WATCH	0.	0.	300000.	300000.	300000.	300000.	300000.	300000.
3	7662	ACTION MFG.	125000.	125000.	125000.	125000.	125000.	125000.	125000.	125000.
4	977930	WILKINSON MF	120000.	120000.	120000.	120000.	120000.	120000.	120000.	120000.
5	535898	KDI PRECISIO	100000.	100000.	100000.	100000.	100000.	100000.	100000.	100000.
6	0		0.	0.	0.	0.	0.	0.	0.	0.
7	0		0.	0.	0.	0.	0.	0.	0.	0.
8	0		0.	0.	0.	0.	0.	0.	0.	0.
9	0		0.	0.	0.	0.	0.	0.	0.	0.
TOTAL CAPABILITY AT INDICATED TIME			505000.	505000.	805000.	805000.	805000.	805000.	805000.	805000.

APPENDIX E

INSTRUCTIONS FOR USE OF THE PBACOR PROGRAM

Next page is blank.

PBACOR (REVISED JUNE 1976)

The first data card for this program must select options and devices. If a new tape is to be output by the program, place the digit 1 in column 3. Place the NBUG value in column 6, and place the DEBUG output device in columns 8-9.

The second data card must give the heading desired for each page of the program output. This heading should give the classification of the output, the date, and the tape number.

This program will print, delete from, or add to cards on the PBA Master Data Tape. Insert the card position in columns 2-6 of the instruction cards. This position is the location of the first card to be printed or deleted, or the location of the card before the first card to be added to the deck. If cards are to be deleted, insert the number to be deleted as a negative number ending in column 10. If cards are to be added, insert any digit in column 8, and follow that card by all of the cards to be added at that point. Indicate the end of the group of cards to be added by inserting a card with four asterisks in columns 1-4. If cards are to be printed, insert the number of cards to be printed ending in column 10. The number of cards to be printed must not exceed 99. Care should be taken to avoid calling for more than one program action at the same point in the data. For example, if the instructions call for the deletion of six cards starting with card 201 and then calls for adding two cards following card 203, the program will execute only the delete instruction. The program will be unable to execute the add instruction because by the time it has finished deletion, it will have passed the point at which the addition was to be made. The operation cited in the example could be accomplished, however, by calling for the addition of two cards following card 200, and then for deletion of six cards beginning with card 201.

An additional feature of the PBAFIX Program is the ability to revise columns 9 thru 80 of any card on the input tape. To select this option, the position of the card on the input tape must be entered in columns 2-6, and a minus 1 (-1) must be entered in columns 7-8. Then, following that instruction card, insert a single card which must have columns 1-8 exactly like columns 1-8 of the card to be revised; thereafter, the card must be blank except for those columns to be changed. The program will store this change card, and when it has reached the proper place on the input tape, it will recover that card and check to see if the first 8 columns of the input card match the first 8 columns of the change card. If they do not match, the program will print an error message but will not make any change in the input card. If they do match, the program will insert any nonblank columns in the change card into their respective positions on the input card and will write the revised card on the new tape.

In making a revision to an input card, if it is desired to insert a blank into a column during the revision, insert the symbol ':' in the proper column. This symbol is represented on the card as a 2,8 punch.

The PBAFIX Program can handle up to 2000 instruction cards and up to 4000 new cards or change cards.

DISTRIBUTION LIST

No. of Copies

	Commander
	US Army Armament Command
2	ATTN: DRSAR-SAS
25	DRSAR-SAM
2	DRSAR-JCAP-E
4	DRSAR-PPI-P (Mr. J. Pohlmann)
	Rock Island, IL 61201
2	Commander
	Rock Island Arsenal
	ATTN: SARRI-LP-L
	Rock Island, IL
12	Defense Documentation Center
	Cameron Station
	Alexandria, VA

Next page is blank.

