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FBI Fingerprint Identification Automation Study: AIDS III Evaluation Report

Volume V: Current System Evaluation

November 15, 1980

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Prepared for

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Federal Bureau of Investigation

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National Aeronautics and Space Administration

by

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California Institute of Technology
Pasadena, California

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ABSTRACT

This volume Current System Evaluation, analyses the current systems employed by the FBI Identification Division. The performance, costs, organization and other characteristics of both the manual system and AIDS II are used to establish a baseline case. The results of the evaluation will be used to determine the feasibility of the AIDS III System, as well as provide a basis for ranking alternative systems during the second phase of the JPL study. The results of the study are tabulated by subject, scope, and methods, providing a descriptive, quantitative, and qualitative analysis of the current operating systems employed by the FBI Identification Division. For a synopsis of the entire report, see the Executive Summary in the Compendium (Volume I).

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SECTION I

INTRODUCTION

This is an evaluation report on the current operating systems of the FBI Identification Division.

A. SUMMARY

The current system evaluation was undertaken to measure the performance, costs, organization, and other characteristics of the current system. Both the manual system and its automated wing, the semi-automated system (AIDS II), were analyzed to establish a baseline case. This base case will be used to evaluate the feasibility of AIDS III where comparative criteria are used and also as the base case for ranking of alternative systems in the second phase of the JPL study.

The results of the measurements are summarized in Table 1-1. The columns of the table list the subjects of analysis, the scope of the analysis or measurement, the methods employed, and the results. The results are subdivided into descriptive, quantitative, and qualitative.

The individual subjects of analysis are listed as rows and fall under the major categories of division organization, manual system, and AIDS II. The manual system and AIDS II are further subdivided by the categories of performance, human resources, cost data, and equipment.

B. SCOPE

This document provides a description of the Identification Division organizational structure outlined in Section II. Significant Division and unit level functions for the manual system and AIDS II are covered in Section III. Work flows throughout the manual system and AIDS II are presented narratively and graphically in Section IV. Section V includes the work load volumes and the measurements of the functions described in Section III. Human resources allocated to the various functions are produced in Section VI. Section VII covers the current system simulation models. Cost data on major activities in the Identification Division are generated in Section VIII. Evaluation of the manual system is presented in Section IX, while Section X gives the status of AIDS II evaluation. Section XI focuses on the impact of change in the Identification Division.

C. OBJECTIVES

The purpose of this document is to provide a descriptive, quantitative, and qualitative analysis of the current operating systems of the Identification Division.

Table 1-1. Current System Evaluation Interim Report Summary

Subject	Scope	Methodology	Analysis		
			Descriptive	Quantitative	Qualitative
ID Division organization	Division, section and unit levels	Interviews, documents	Overview, see II	--	--
Manual system					
Functions	Division and unit levels of most sections	Interviews, questionnaires, documents	See III-A,B	--	--
Work flow	Unit level	Interviews, observations, documents	See IV-A, basically serial queueing network	Random processing, see V-D	Lack of work flow interfaces, see IX-s
				Excessive holding time of transaction after processing, see IX-B	Telelift not designed to optimize operation, see IX-B
					Work flow paths follow organizational boundaries in most cases, see IV-A
					No audit trail of transactions or criminal history records, se IX-B

Table 1-1. Current System Evaluation Interim Report Summary
(Continuation 1)

Subject	Scope	Methodology	Analysis			
			Descriptive	Quantitative		Qualitative
Manual system (cont'd)						
Work loads	Unit level	Queueing "black box" concept	- -	Unbalanced work loads, see IX-B		- -
				Excessive queue sizes (175,000 £/p), see VIII-B		Inefficient transaction handling techniques, see IX-B
				Random transaction batch sizes, see IX-B		
				Extreme variation in work loads (arrivals and departures), see IX-B, Appendixes A and B		
Service times	Individual servers	Time and motion measurements	Measurements provided, see V-E	- -		- -
	Telelift	Measurements and scale extrapolation				

Table 1-1. Current System Evaluation Interim Report Summary
(Continuation 2)

Subject	Scope	Methodology	Analysis		
			Descriptive	Quantitative	Qualitative
Manual system (cont'd)					
Turnaround times	Division level	Random sampling	--	Range of 14 to 175 calendar days, see IX-A	No turnaround time standards for sections or Division, se IX-B
Human resources					
Employees	Division level	Documentation, interviews	--	Total = 3399, manual = 2580, see IX-A	--
Turnover	Division level	Documentation, interviews	--	31% (FY 78 and 79), see VI-E	High rate may persist under present circumstances, see IX-B
Cost data					
Labor	Manual system	Questionnaires, documentation	--	Annual labor cost (FY 79) = $32,200,000, Division labor cost (FY 79) = $44,370,000, see VII-A	--

Table 1-1. Current System Evaluation Interim Report Summary
(Continuation 3)

Subject	Scope	Methodology	Analysis		
			Descriptive	Quantitative	Qualitative
AIDS II					
Functions	Subunit level	Documentation	Parallel to name search, file update, and response generation, see III-C	---	---
Configurations	Subunit level	Documentation, interviews	Modular, computer-assisted manual operations, see III-C	---	---
			8 minicomputers, 1 host processor, ≈ 164 terminals, see III-C		
Performance	TBD	TBD	TBD	TBD	TBD
Human resources					
Labor	AIDS II	Questionnaires, interviews	---	ID Division = 3399, AIDS II = 392	---
Technical staff	AIDS II program	Interviews	---	2 engineers, 2 system analysts, see VI-C	---

TBD = To Be Determined

Table 1-i. Current System Evaluation Interim Report Summary
(Continuation 4)

Subject	Scope	Methodology	Analysis		
			Descriptive	Quantitative	Qualitative
Cost Data					
Labor	AIDS II	Questionnaires, documentation	--	Annual (FY 79) $5,000,000 not including TSD, see VIII-A	--
Equipment					
Capital	AIDS II	Interviews, documentation	--	$1,230,000, see VIII-B	--
Leasing	AIDS II	Documentation	--	$47,400/year, see VIII-B	--
Maintenance	AIDS II	Documentation	--	$92,000/year, see VIII-B	--

SECTION II

ORGANIZATION

The Identification Division comes under the FBI Executive Assistant Director for Law Enforcement Services branch. It serves as a national data base for fingerprint records and provides identification services for the criminal justice community both nationally and internationally.

The Identification Division is headed by a Special Agent Assistant Director. The identification and record keeping services and personnel management are headed by Deputy Assistant Directors (Figure 2-1).

The division has eight sections:

(1) Assembly: Record storage and maintenance.

(2) Automation and Research (A&R): In charge of the automation of the Identification Division functions and presently operates AIDS II system.

(3) Card Index: Manual name search.

(4) Fingerprint Correspondence: File update and response generation.

(5) Latent Fingerprint: Mostly criminal identification of latent prints.

(6) Posting: Processing of documents related to probation and wanted individuals.

(7) Recording: Front-end document distribution and primary and secondary fingerprint classification.

(8) Technical: Technical fingerprint search.

Each section is headed by a section chief, usually a special agent, and several assistants, who may or may not be special agents.

The sections include a number of operating units varying in size from two to 42 employees. In general each unit is headed by a supervisor and, when the unit size exceeds 10 employees, an assistant supervisor. The unit is the basic production cell in the Division assembly line. The unit supervisor and assistant supervisor are directly involved in the work production, work assignment duties, and quality control of the workers' output.

Each section houses a front office for the section chief, his assistants, and a number of secretaries and typists for handling section correspondence and personnel management. The front office of

the Identification Division has the overall authority for formulating, planning, directing, and executing programs related to document processing in addition to personnel management.

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                    │      FBI        │
                    │  IDENTIFICATION │
                    │    DIVISION     │
                    │   ASSISTANT     │
                    │    DIRECTOR     │
                    └─────────────────┘
                             │
            ┌────────────────┴────────┐
  ┌──────────────────┐     ┌──────────────────┐
  │ DEPUTY ASSISTANT │     │ DEPUTY ASSISTANT │
  │    DIRECTOR      │     │    DIRECTOR      │
  │  (PERSONNEL)     │     │  (OPERATIONS)    │
  └──────────────────┘     └──────────────────┘
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ASSEMBLY SECTION	AUTOMATION AND RESEARCH SECTION	CARD INDEX SECTION	FINGERPRINT CORRESPONDENCE SECTION

| LATENT FINGERPRINT SECTION | TECHNICAL SECTION | RECORDING SECTION | POSTING SECTION |
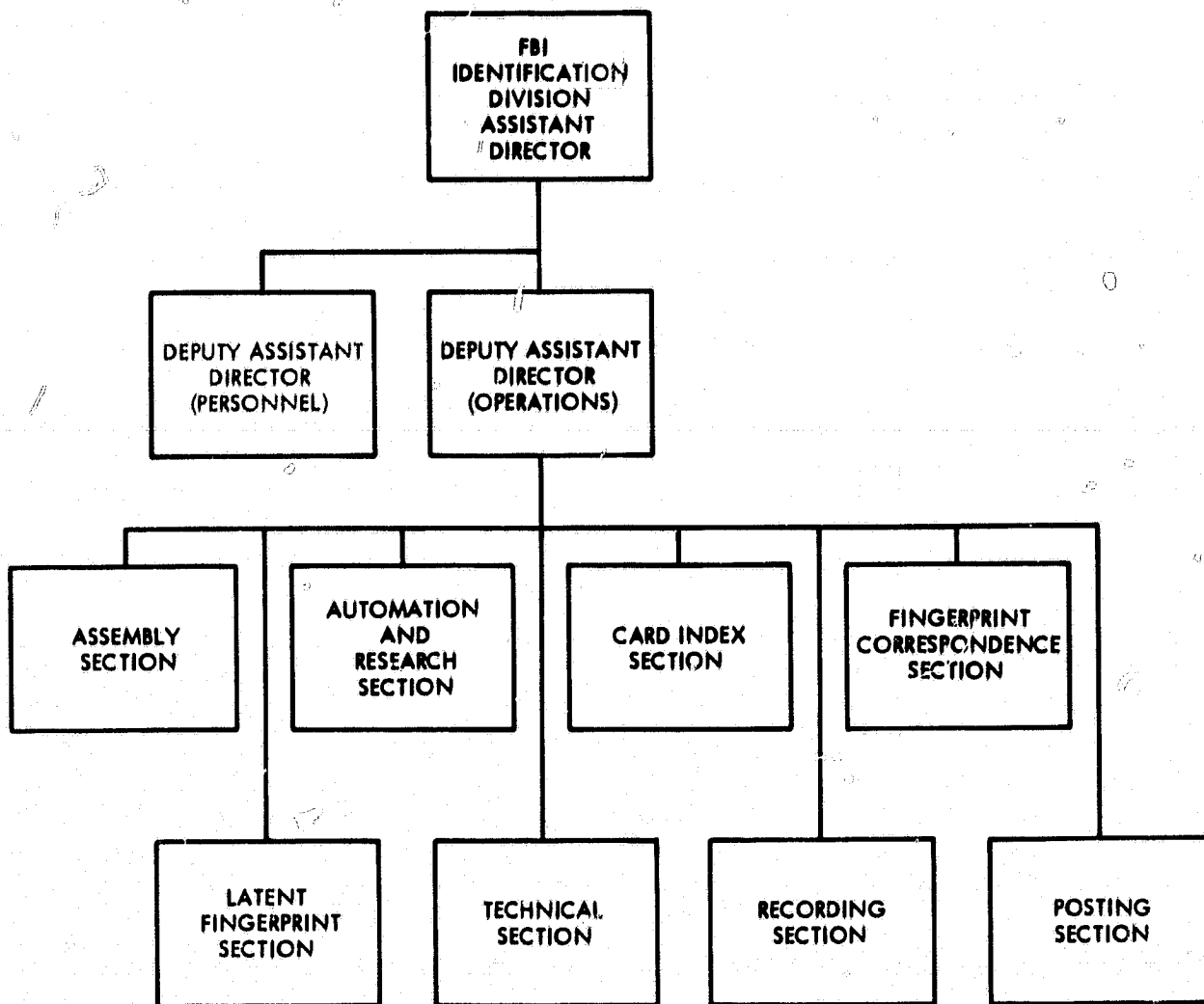
Figure 2-1. Organization of the Identification Division

SECTION III

FUNCTIONS

A. IDENTIFICATION DIVISION FUNCTIONS

The Identification Division functions are to:

(1) Acquire, classify, update, and preserve fingerprints and related identification data files.

(2) Identify criminals, unknown dead, and amnesia and disaster victims.

(3) Provide criminal history data (if any) to authorized agencies.

(4) Provide file identification information to authorized agencies and individuals.

(5) Conduct fingerprint identification training courses for state and local government/law enforcement personnel.

(6) Manage budget, personnel, work scheduling, systems, equipment, and facilities.

(7) Implement programs relative to Identification Division automation.

B. MANUAL SYSTEM FUNCTIONS (Unit Level)

1. Recording Section

The Recording Section receives mail at the incoming mail room, checks fingerprint cards, both applicant and criminal, for completeness, tags each print with the day of the month the print was received in the Recording Section, and determines the primary and secondary classifications of fingerprint cards.

The main units within the Recording Section are:

(a) Mail Room.

(b) Recording Unit.

(c) Blocking Out Unit and Civil Legibility Unit.

(d) Correspondence and International Exchange Unit.

(e) Name Check Unit.

a.   **Mail Room.** The mail room receives incoming, fingerprint-related mail. Correspondence and prints from foreign countries are routed to the Correspondence and International Exchange Unit. Other correspondence is sorted and routed to the appropriate units. Fingerprint cards are separated by type (applicant and criminal) and by state and sent to the Recording Unit.

b.   **Recording Unit.** The Recording Unit receives fingerprint cards from the mail room. They are checked for completeness. Applicant cards are checked for date of birth, job position, etc. Criminal cards are checked for date of birth, date of arrest, charge, etc., and rubber stamped with the current date. The fingerprint cards are then rechecked and tagged with the current date, sorted by FBI number, and routed to the appropriate units.

c.   **Blocking Out Unit and Civil Legibility Unit.** The Blocking Out Unit determines the primary and secondary fingerprint classifications based on the Henry Classification System. It is necessary to have this information during the name search (described later) in order to discriminate among individuals with the same name. The Blocking Out Unit also determines the best of any multiple print submissions (common practice with applicant prints), and, in the case of illegible prints, the Blocking Out Unit stamps the prints so that they will be name searched only and returned to the Recording Section if no identification is made. Such prints are returned to contributors.

d.   **Correspondence and International Exchange Unit.** The Correspondence and International Exchange Unit provides any special handling for certain types of incoming correspondence; e.g., requests for information from private individuals. It also provides the necessary handling for correspondence or fingerprint cards from foreign countries.

e.   **Name Check Unit.** The Name Check Unit provides any necessary special handling of incoming requests for name checks.

2.   Card Index Section

The principal function of the Card Index Section is to search criminal and applicant prints by name. A master file, composed of 3" x 5" file cards, is maintained for this purpose and contains the name and full fingerprint classification of each person represented in the criminal fingerprint files and any aliases which have been used. In order for a fingerprint match to be made, the minute characteristics of each fingerprint must match exactly (see item 3 below). This type of comparison, which can be quite time-consuming, is normally made in the Technical Section. It is much easier to search for the name in the card index files. If a tentative match is found, indicating that prints are already on file for that person, the print already in the FBI files can be retrieved. The match can then be confirmed by fingerprint characteristics.

If the FBI has more than one criminal print on file for a person, all but the best prints will be maintained in a criminal history record in the Assembly Section (see item 4). The most legible and current print will be maintained in the Technical Section's master files. If a match tentatively is made by name in the Card Index Section, the card on file will indicate whether or not a criminal history record exists in the Assembly Section for that person. If a record exists, the newly received print will be sent to the Assembly Section for positive match verification and further processing. If no record exists, the print will be sent to the Technical Section where the master print will be retrieved for positive match verification.

The units within the Card Index Section are:

(a) Collection Unit.

(b) Search Units.

(c) Sequencing Unit.

(d) Purge Unit.

(e) Evaluation Unit.

a. <u>Collection Unit</u>. The Collection Unit receives virtually all Card Index Section work from the rest of the Identification Division, sorts it, and routes it to the appropriate units within the Card Index Section. For instance, cards which have been "blocked out" (item 1-c above) are sent to the Card Index Section for a name search. The Collection Unit receives the cards, sorts them (twice), and routes them to the appropriate search unit. All material going out of a Card Index Section is generally sent to the Collection Unit, where it is sent on to the next appropriate section.

b. <u>Search Units</u>. There are six male subject Search Units and one female subject Search Unit in the Card Index Section, each performing essentially the same functions. The units receive fingerprint cards to be searched by name. The male units are divided alphabetically in order to keep them at a manageable size. The file cards are searched alphabetically for a tentative match with the fingerprint cards. If more than one file card has the same name, the primary and secondary classifications on the fingerprint card are used for greater discrimination. If a tentative match is made, the file card will indicate whether a master print is on file in the Technical Section or if a criminal history record exists in the Assembly Section. The file card will then be removed, attached to the fingerprint card, replaced by a charge card in the card file, and routed to the appropriate section via the Collection Unit. If no tentative match is made, possible aliases will be searched within the unit. If still no tentative match is ever made, the fingerprint card will be routed to the Technical Section for a fingerprint search.

In order to maintain the files, new 3" x 5" cards that are generated by first-time offenders are constantly being added to the files. Purges cause cards to be deleted from file.

c. <u>Sequencing Unit</u>. The Sequencing Unit puts cards in alphabetical order and distributes them to the appropriate Search Units. It is here that cards are returned to the file and new cards are added.

d. <u>Purge Unit</u>. The Purge Unit is responsible for deleting appropriate information from Card Index files. For example, a person will have his card removed from the file if he has one conviction and it has been reversed or successfully appealed.

e. <u>Evaluation Unit</u>. The Evaluation Unit deals primarily with the evaluation of errors made by Card Index personnel (misfiled cards, missed matches, etc.). Error records on personnel are maintained as a form of quality control. Certain work involving special handling, formerly performed by a special handling unit, is now performed largely by personnel within the Search Units.

3. Technical Section

The principal function of the Technical Section is to attempt to match newly received fingerprint cards, which have not been tentatively matched in the Card Index Section, with the prints of known criminals. The Technical Section maintains a master file of criminal fingerprints. It contains the clearest set of fingerprints available for each person with a criminal record. Fingerprint cards are filed in the various units according to the Henry Classification System. The actual matching of fingerprints is done by the comparison of minutiae: tiny individual points on each fingerprint (ridge ends and bifurcations). The classification system provides a gross division of the master file by grouping together prints with similar general overall patterns. A very large section of the master file can be eliminated from the search by classifying the fingerprints and comparing the minutiae only with the fingerprints having the same classification. Newly received cards are fully classified and searched in all appropriate areas. Due to imprecision in taking prints, certain prints potentially have more than one classification, thus requiring additional searches. Also, some prints fall near the edge of the category boundaries and are searched in both categories to assure search completeness.

Criminal or applicant fingerprint cards which are positively identified are sent to the Assembly Section for verification. Applicant fingerprint cards which are not identified are sent to the Fingerprint Correspondence Section for response to the contributor, and criminal fingerprints which are not identified (presumably first offenders) are sent to the Automation and Research Section for entry into the automated system (AIDS II).

The units within the Technical Section are:

(a) Sorter's Desk.

(b) Search Units.

(c) Two-Unit Desk.

(d) Evaluation Desk.

(e) Special Desk.

(f) Locate and Purge Desk.

(g) Wanted Research Desk.

a.   Sorter's Desk. The Sorter's Desk performs many of the same functions for the Technical Section as does the Collection Unit for the Card Index Section (see item 2-a). Most incoming work for the Technical Section is received at the Sorter's Desk where it is sorted (twice) and routed to the appropriate units. All outgoing material from Technical Section units goes to the Sorter's Desk where it is routed to other units within the section or to other sections within the division.

b.   Search Units. There are 17 male subject and six female subject Search Units within the Technical Section. Although they all perform the same functions, each unit has different classes of fingerprints. Fingerprint cards are filed by fingerprint classification within each unit. Newly received fingerprint cards are fully classified and searched accordingly. Where there is the possibility of more than one classification, all appropriate classifications are searched. If necessary the print is also sent to another Search Unit (via the Sorter's Desk). Matches and non-matches are sent to other sections for appropriate responses to the agency submitting the prints. Non-matches are checked by unit supervisors; matches are generally checked in another section.

c.   Two-Unit Desk. All prints arriving at the Sorter's Desk to be searched are sent first to the Two-Unit Desk for a legibility check because illegible prints cannot be classified properly and therefore cannot be searched properly. Approximately 10% of the prints received by the Technical Section are returned to the contributors as being illegible.

The Two-Unit Desk also performs all necessary work to complete the searches on any fingerprint cards which have been searched unsuccessfully in two Search Units and still require further searching. This is done to expedite completion of those fingerprint cards (relatively few in number) which require extensive searching.

d.   Evaluation Desk. The Evaluation Desk receives work when a Technical Section error has been identified. The Evaluation

Desk evaluates the nature and source of the error, explains the error to the person responsible, and maintains personnel error records. The work containing errors is sent back to the Sorter's Desk after evaluation has been completed.

    e.   Special Desk. The Special Desk performs all necessary procedures on work requiring special handling. Such work includes telephone requests and prints on deceased persons or amnesia victims.

    f.   Locate and Purge Desk. The Locate and Purge Desk has two different functions. It purges appropriate information from Technical Section files and it locates prints missing from the Technical Section files.

    g.   Wanted Research Desk. The Wanted Research Desk repeats searches on persons with wanted notification placed against them. The fingerprint classification is rechecked first, then the search is carried out by an employee assigned to this desk.

4.   Assembly Section

    The Assembly Section maintains, in FBI number sequence, records on all criminal fingerprints that have been submitted on more than one occasion. The best set of prints are designated the master prints and are kept in the Technical Section files. All other prints are kept in criminal history records which are filed in the Assembly Section. These records also contain a summary of the offenses and, when the information is available, the disposition of each arrest. This summary is known as the "rap sheet" or identification record.

    The Assembly Section identifies and verifies matches based on the Card Index Section name search when the name search indicates that a criminal history record exists in the Assembly Section. When a tentative match during the name search indicates that there is only one print on file, that print will be in the Technical Section. The Technical Section will make the identification; the Assembly Section will verify the identification.

    The units within the Assembly Section are:

    (a)   Current Work Unit.

    (b)   Identification Unit.

    (c)   Verify Unit.

    (d)   Locate Desk.

    (e)   Special Request Desk.

    (f)   File Units.

    (g)   Front Office Correspondence Unit.

(h)   Microfilm Unit.

(i)   Expungement Desk.

(j)   Dead Desk.

(k)   Computerized Criminal History (Support Unit).

a.   <u>Current Work Unit</u>. The Current Work Unit functions for the Assembly Section in a manner similar to the way the Sorter's Desk functions for the Technical Section and the Collection Unit functions for the Card Index Section. The Current Work Unit receives work from other units and sections, sorts it, and routes it to appropriate units and sections. It also retrieves criminal history records from the Assembly Section files. Finally, the Current Work Unit checks the criminal history records for completeness before they are sent to the Verify Unit.

b.   <u>Identification Unit</u>. The Identification Unit makes the initial match on prints if a tentative match is found during the name check process (see item 2-b). Current prints where a name check match has been made are compared with the prints in the criminal history records bearing the same name, and Identification Unit personnel confirm the match by fingerprint minutiae.

c.   <u>Verify Unit</u>. The Verify Unit verifies any prints that are considered to be a positive match. The initial match may have been made in the Identification Unit of the Assembly Section or it may have been made in the Technical Section. In either case, the Verify Unit will check the prints again and affirm to the identification as positive.

d.   <u>Locate Desk</u>. The Locate Desk searches for missing criminal history records anywhere in the Division. The Locate Desk fulfills a role for the Assembly Section similar to that of the Locate and Purge Desk for the Technical Section.

e.   <u>Special Request Desk</u>. The Special Request Desk retrieves criminal history records in response to special requests from other sections. This work usually involves responses to urgent telephone requests or requests for information on wanted persons.

f.   <u>File Units</u>. The File Units return criminal history records to the appropriate places in the files. They are also responsible for adding any appropriate material (such as case dispositions) to the records in the files.

g.   <u>Front Office Correspondence Unit</u>. The Front Office Correspondence Unit compiles the materials to respond to requests for "rap sheets" and other miscellaneous correspondence. The Front Office Correspondence Unit obtains the criminal history record, attaches to the incoming correspondence any necessary instructions, and forwards

the material to the Fingerprint Correspondence Section or Automation and Research Section where the actual response will be prepared.

h.   **Microfilm Unit.** The Microfilm Unit puts appropriate criminal history records or portions of them on microfilm. Records which are microfilmed include those on persons for whom death notices have been received, those on elderly persons for whom no prints have been received for a certain number of years, or, in some instances, those merely containing large numbers of prints.

i.   **Expungement Unit.** The Expungement Unit deletes appropriate material from criminal history records maintained in the Assembly Section files. Deletion is usually required because of a court order vacating a judgment, overturning a conviction, or some other similar situation.

j.   **Dead Desk.** The Dead Desk clerks process criminal history records on persons for whom death notices have been received. They obtain master prints from the Technical Section, verify the identity, make sure the record is complete, and prepare it for microfilming.

k.   **Computerized Criminal History (Support Unit).** The Computerized Criminal History Support Unit handles print records that exist in the National Crime Information Center's Computerized Criminal History files (NCIC/CCH). This unit sends copies of dispositions to NCIC of the Technical Services Division for all flagged criminal history records.

5.   Fingerprint Correspondence Section

The primary function of the Fingerprint Correspondence Section is to prepare and mail responses to fingerprint searches and other incoming requests for records. The response is ordinarily made after a fingerprint search. It can indicate that no criminal record exists in the FBI files for a given set of prints (applicant or criminal), or it can forward records on file to the requesting agency. The Fingerprint Correspondence Section prepares responses only for those people whose prints are not in the automated system (FBI numbers starting with other than N, P, R, T, and V). All outgoing mail of the Identification Division is handled through the three mail room units in the Fingerprint Correspondence Section.

The units within the Fingerprint Correspondence Section are:

(a)   Incoming Work Unit.

(b)   Current Print Units.

(c)   Non-Serious Offense Units.

(d)   Non-Federal Applicant Unit.

(e)   Computerized Criminal History Unit.

(f)   Machine Room.

(g)   Missing Persons Unit.

(h)   Mail Room 1 (Ident).

(i)   Mail Room 2 (Non-Ident).

(j)   Mail Room 3.

a.   **Incoming Work Unit**. The Incoming Work Unit performs the same functions for the Fingerprint Correspondence Section as do similar units for other sections (see items 2-a, 3-a, and 4-a). The Incoming Work Unit receives all work, sorts it, and routes it to the appropriate units within the section.

b.   **Current Print Units**. There are six Current Print Units all performing the same functions. Identified work that arrives usually consists of criminal history records from the Assembly Section, although some work may have come through a Non-Serious Offense Unit (see 5-c below). A typist adds onto the "rap sheet" any dispositions or other information filed in the record since its last use. The updated record is reviewed by a proofreader. An appropriate number of photocopies are made for response to the contributor, and finally the record is put back in order and returned to the files. The copies for the response are sent to the outgoing mail room.

c.   **Non-Serious Offense Units**. Recent court orders have resulted in restricting dissemination of information on non-serious offenses. Criminal history records arriving at the Fingerprint Correspondence Section with information on non-serious offenses entered before the court orders are first sent to the Non-Serious Offense Units. There, Non-Serious Offense Unit clerks mark the information that is to be omitted when a Current Print Unit typist updates the "rap sheet".

d.   **Non-Federal Applicant Unit**. All applicant prints from non-federal contributors are sent to the Non-Federal Applicant Unit. If no identification is made during the fingerprint search, the applicant print is stamped to indicate no arrest record exists and sent to the Ident Mail Room (Mail Room 1). If criminal identification is made, an analyst indicates the appropriate portions of the record to be sent to the contributor and the procedure used in the Current Print Units is followed.

e.   **Computerized Criminal History Unit**. The Computerized Criminal History Unit handles print records that exist in the National Crime Information Center's Computerized Criminal History files. This unit updates "rap sheets" and sends copies to NCIC for file update.

f.   **Machine Room**. The Machine Room makes photocard copies of applicant prints to be retained. The prints and the photocards are then sent to the civil files.

g. **Missing Persons Unit.** The Missing Persons Unit provides special handling for all missing persons correspondence.

h. **Ident Mail Room.** The Ident Mail Room mails responses for all applicant prints (identified or not, which may make the name Ident Mail Room a misnomer), identified criminal prints, and all other items not handled by the Non-Ident Mail Room.

i. **Non-Ident Mail Room.** The Non-Ident Mail Room is responsible for stuffing and addressing envelopes and mailing replies for all non-identified criminal prints. These replies come from the Automation and Research Section and are essentially form letters.

j. **Mail Room 3.** Mail Room 3 provides preaddressed envelopes or labels to the other mail rooms and maintains an up-to-date address file on contributors.

6. Latent Fingerprint Section

The primary functions of the Latent Fingerprint Section are to process evidence for latent impressions using chemical or physical means, identifying and preserving latent impressions, making comparisons between developed latent prints and the prints of known suspects or victims, and examining crime scenes for latent prints. The comparison function is supported by special files (such as the Single Fingerprint File and the National Unidentified Latent file, etc.). Developed latent prints are searched in the appropriate file.

The section also assists in identifying disaster victims, provides testimony in criminal prosecutive actions, and conducts training for FBI personnel and for other law enforcement personnel nationwide.

7. Posting Section

The Posting Section is not a part of the normal work flow of the Identification Division; i.e., fingerprints that come in for regular processing do not go to the Posting Section unless triggered by certain conditions such as a "stop" flag in Assembly Section criminal history records. The "stop" flags are the result of wanted notices initiated by local law enforcement agencies or FBI field offices. A flag interrupts the normal flow of a fingerprint card processing and causes a jump to the Posting Section for handling.

In addition, the Posting Section handles "flash" notices. These are administrative-type requests generally initiated by probation and parole officers.

The Posting Section is also responsible for correction of certain types of identification records such as the partial purge. An administrative order from the Attorney General or someone else of that stature can order the removal of some of the charges from the records.

A good portion of the wanted notices come through the NCIC system located in the Technical Services Division.

C.   AIDS II

1.   Overview

AIDS II is a semi-automated document processing system. While the key element in AIDS II is the computerized subject search, it also encompasses all the capabilities that were inherent in AIDS I (i.e., computer-generated arrest data, personal descriptive information, and name index cards).

AIDS I, which began operation in August 1973, was superseded as a separate system in October 1979 by AIDS II. All AIDS I functions were merged into an AIDS II system that:

(1)   Produces automated responses such as "rap sheets".

(2)   Performs automated subject search.

(3)   Produces automated notifications for most flash notices.

(4)   Produces management and statistical reports.

(5)   Provides an internal on-line query and response capability.

At this point it is important to point out the difference between the manual name search function in the manual section and the subject search in AIDS II. Manual name search procedure is based mostly on name and aliases, while subject search uses additional identification parameters (Social Security number, originating agency number, date of birth, name, sex, and blocking-out) in order to locate the FBI number of the candidate records.

2.   Document Routing

The cutoff age largely determines document routing to AIDS II. The cutoff date of January 1, 1958 was chosen for AIDS II purposes. This date corresponds to first-time offenders 16 years of age. Searches for subjects whose reported year of birth is equal to or later than January 1, 1958 are routed to AIDS II. Searches for those subjects whose birthdate precedes January 1, 1958 are routed to Card Index. If a search in the Card Index criminal file indicates that the subject is in the AIDS II data base, it will be routed to the Data Entry Unit (in A&R) through the Assembly Section for record update and response generation.

3. Subject Search Unit

The function of this unit is to enter subject current fingerprint identification characteristics (such as name, date of birth, primary and secondary classification, sex, social security number, and originating agency number) on a terminal, interrogate the host computer files for single or multiple tentative identifications, and route the fingerprint to either Technical Section or Assembly Section depending on the outcome of the interrogation.

4. Data Entry Units

The Data Entry Unit functions as shown in Figure 3-1. All fingerprint cards, dispositions, and miscellaneous documents received from other sections are sorted, batched, and distributed by the Production and Control Subunit. This subunit also coordinates work with the System Development Section of the Technical Services Division where the host processor is located. The Production and Control Subunit assigns a process control number to all documents and an FBI number to all non-identified fingerprint cards before batching and sending to other subunits.

All subunits receiving work from the Production and Control Subunit are arranged on a modular basis; i.e., processing takes place along similar functional steps. The subunits are:

Ident.	2 subunits
Non-Ident.	2 subunits
Final Dispositions.	2 subunits
Miscellaneous Documents.	2 subunits

The work functions of these subunits are: coding, reviewing, data entry, verification, and error correction and proofing.

The coding function totally prepares a fingerprint card or document for data entry. This step is present to ensure that significant elements of a fingerprint card are present. These include ident symbol (∅), crossed mark (/), search mark (X) or (O), FBI number, process control number (PCN), recorded date, and originating agency number. A set of rules governs the acceptable format for data entry that the coding operator uses in the document preparation, such as the number of characters in each data element to be entered into the system.

The review function checks a list of the work done in the previous step; i.e., coding.

The data entry function enters the data, using a cathode-ray tube (CRT) keyboard terminal of coded and reviewed elements of fingerprint cards or other documents. Typists receive fingerprint cards in small batches.
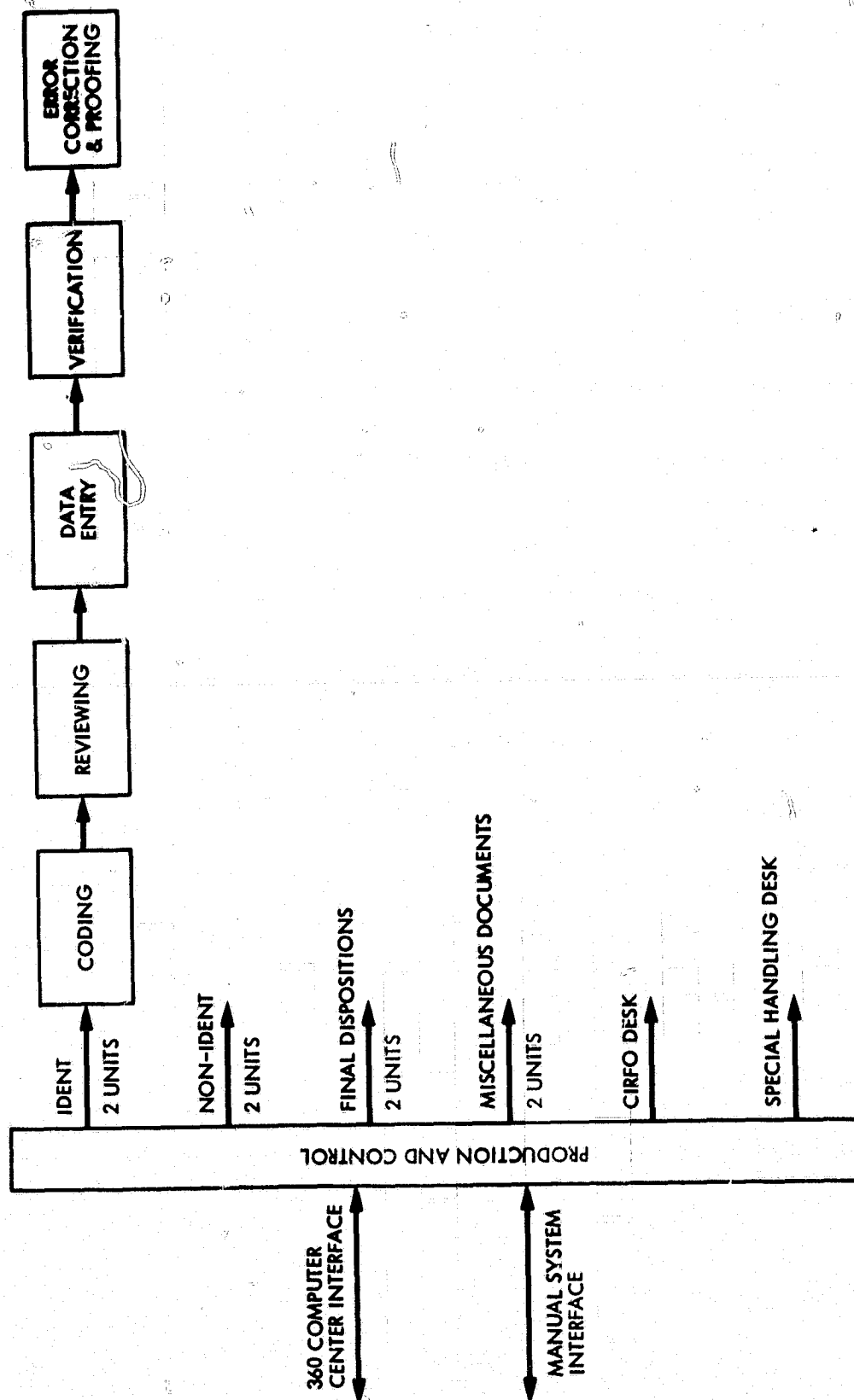
Figure 3-1. Data Entry Unit Functional Diagram

The verification function checks the work done in data entry, makes necessary corrections, and batches the fingerprint cards for pickup by the Production and Control Subunit.

The error correction and proofing function verifies the transactions that have been properly entered and processed by the computer (370/155) system.

In addition to the previously mentioned subunits, there are several desks (less than five employees) which perform a variety of functions. An FBI program called Computerized Identification Records for Federal Offenders (CIRFO) is handled at the CIRFO desk. Its main function is to act as the 51st state handling all federal arrestees to ensure that their characteristics are entered into the CCH file of the NCIC System. This unit also ensures that NCIC fingerprint classification is correctly entered on all CIRFO prints from the manual files and that the listed contributor and charge meet the necessary criteria for inclusion in the CIRFO/CCH program. The Special Handling Desk assists in resolving source document problems, if any, relating to data entry format.

5.   Configuration

The Data Entry Unit in Automation and Research has eight (Four-Phase) minicomputer systems configured as follows:

Model No.	Description	Quantity
7009-M	Central processing unit	1
7092-096	Memory module	1
7016-08N	Video support module	2
7420	Keyboard interface	1
7111-A	Video display	20
7203	Keyboard	20
8149	Printer	1
8503	Tape drive and controllers (rent)	1
8262	Disk controller	1
8436	BS DS controller	1
8231-01	Disk drive	1
8231-02	Disk drive	2
8230	Disk drive	1

6.   Host Processor Links

Each one of the minicomputer systems is linked to a 370/155 host processor through voice-grade, full-duplex, 4800 baud line (Figure 3-2).
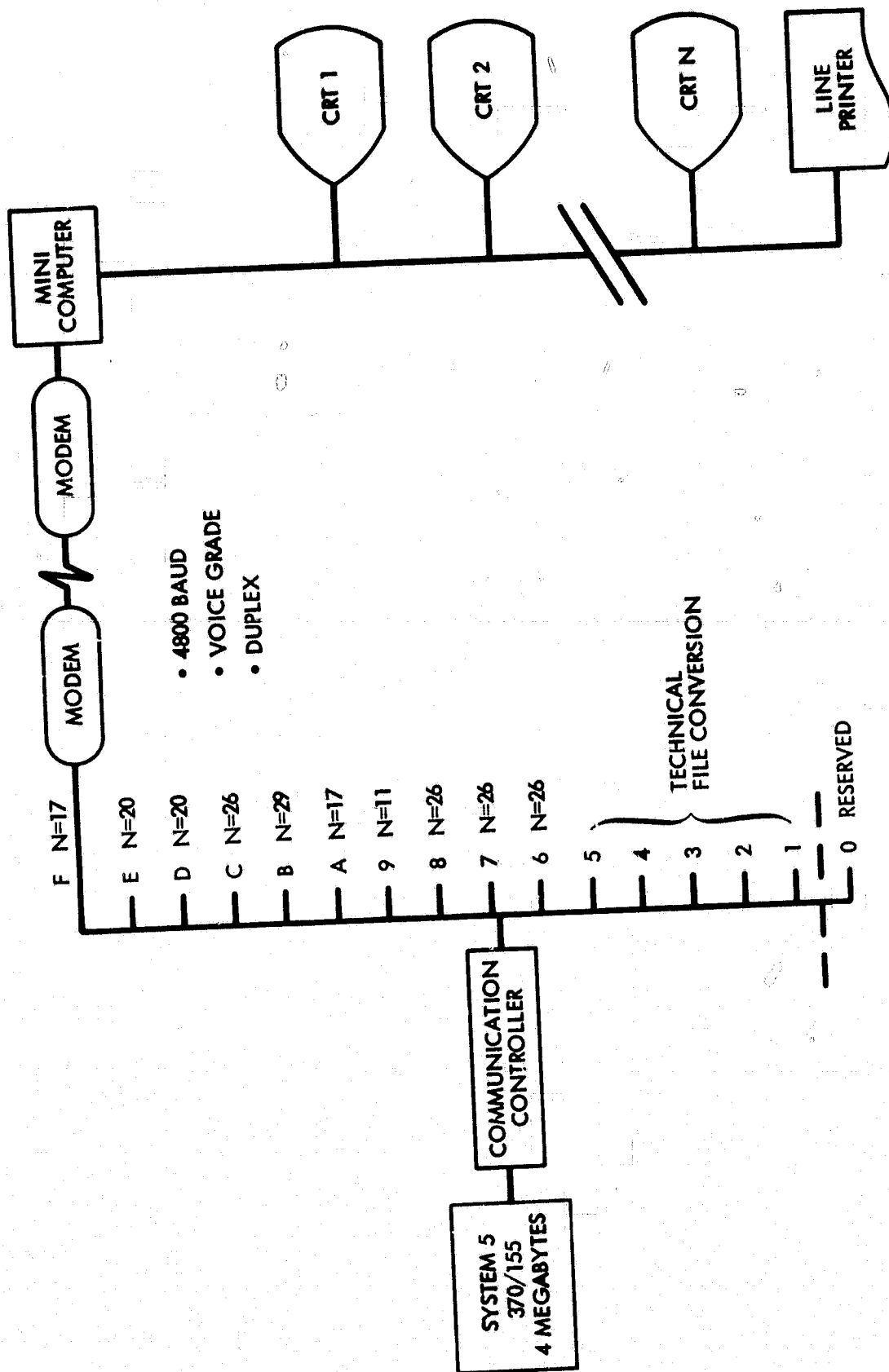
Figure 3-2. AIDS II Communication Links

D. AUTOMATED FILES

The AIDS II data base is made up of a number of major files that provide background for subject search and historical criminal data.

1. Computerized Criminal Name

The Computerized Criminal Name file (CCN) contains identification records for all automated FBI numbers. A subject's name, fingerprint classification, sex, Social Security number, and other pertinent personal data are included in each of these records.

2. Computerized Criminal Record

The Computerized Criminal Record file (CCR) contains historical records for most of the FBI numbers represented in the CCN File. File records contain segments of data relative to history of arrests, court decisions, and custody cases. There are one or more CCR records for each CCN record (FBI and White House employees and deceased persons are excepted). CCN and CCR files are also referred to as the CCNR file.

3. Computerized Contributor Abbreviated Name

The Computerized Contributor Abbreviated Name file (CCA) contains data on authorized contributors who submit or receive information from the Identification Division. Each CCA record identifies contributors by an identification number, an abbreviated name, and number of response copies.

4. Computerized Record Sent

The Computerized Record Sent file (CRS) includes historical records of responses to contributors. The file is referenced by FBI number, identification number of contributing agency, and date of response. A mailing list can be constructed for any particular subject using this file and recipients noted in CCA, CCN, and CCR files.

5. Computerized Ident Response

The Computerized Ident Response file (CIR) is the source of all information that is displayed on identification record responses.

6. Computerized Non-Ident Response

The Computerized Non-Ident Response file (CNR) is the source of all information that is displayed on non-identification responses.

7.   Update Error

The Update Error file (ERR) is an error log file used when
processing transactions against CCN and CCR files.

8.   Name Index Card

The Name Index Card file (NAI) supplies data to be generated on
index cards. File records are produced as a result of processing
fingerprints and/or modifying index card data.

9.   Transaction Control

The Transaction Control file (TRC) contains status flags
indicating various processing stages and current transaction records
for updating and report generation.

SECTION IV

WORK FLOW

A. DIVISION LEVEL

The functional work flow of the Identification Division is shown in Figure 4-1. Most of the work is received in document form at the incoming mail room shown in box 1. Less than half of the documents (dispositions, wants, flashes, requests for name checks, etc.) are routed to respective work stations for handling (box 2). The bulk of the documents are in the form of fingerprint cards, called current prints. These are reviewed for completeness (date of birth, sex, agency name and address, etc.) and then routed to work stations according to two major criteria: (1) subject's age and (2) FBI number (fingerprint cards that are missing essential bits of information are returned to the contributor). The presence of certain FBI numbers on a fingerprint card indicates that a record on the individual already exists. Those cards are routed directly to the records storage area, in the Assembly Section (box 9). The remaining prints are categorized by the primary and secondary classifications according to the Henry Classification System. The current prints are then searched by name either manually (box 6, Card Index Section) or through the automated subject search (box 5, AIDS II, for subjects born after January 1, 1958).

In both cases, if a tentative subject match is found and there is an indication that a record exists, the prints are routed to the records storage area. But, if a tentative subject match is found and only a master print exists, then the current print is routed to the print storage area, in the Technical Section (box 7). The master print is retrieved from the files and the two prints are identified and then sent to the records storage area for verification.

If no match is made by name and subject characteristics, the current print is routed to the Technical Search Units in the Technical Section (box 8). The current print is fully classified and compared with all prints on file having the same basic classification. Illegible prints that cannot be classified because the fingerprints were smeared, not fully rolled, or are very light are returned to the contributors after the name search has been conducted. Prints that are identified during the technical search are routed to the records storage area, Assembly Section, shown in box 10, for verification. Criminal prints that are not identified are added to computerized files and a response to the contributor is generated, box 12, AIDS II. Applicant prints that are not identified in the technical search are routed to a different area for response generation, Fingerprint Correspondence Section shown in box 13. Non-identified applicant prints that are to be retained (e.g., military) are routed to storage, civil files (box 14).

Returning to box 9, current prints indicating the e istence of records or prints identified during the name search cause the records to be pulled. Identification is made by comparing the cu rent prints and the prints of record. The identification process is hen repeated by differen: personnel for purposes of verification. Where an identification is made during the technical search, only the verification process is carried out in the records storage area (box 10).

All output from the records storage area (identified and verified prints) is sent to either AIDS Il or the Fingerprint Correspondence Section. Those prints that are already on the automated system are automatically updated and a response is prepared which includes prior criminal history (box 12, AIDS II). Those prints that are not in the automated system will have their records manually updated and a response showing prior criminal history will be prepared by the Fingerprint Correspondence Section (box 11).

All responses are sent to the outgoing mail room of Fingerprint Correspondence Section, box 15, where envelopes are addressed, stuffed, and mailed to the contributor of the current print.

Returning to the routing function shown in box 2, Recording Section, the distribution of dispositions and miscellaneous documents to various work stations, such as fingerprint cards, is based on the date of birth of subjects (cutoff birthdate: January 1, 1958) and contributor-provided FBI numbers. Documents with subjects under the cutoff age and with no FBI number provided will be routed to the automated subject search (box 16). If the outcome is identification or non-identification, an automated response is generated and/or the file is updated (boxes 20, 21, 22).

Documents for subjects over the cutoff age will be routed to the manual name search (box 17). From there they go to the manual response generation area shown in box 19 for response generation and/or file update after the criminal history records are pulled from the file, box 18a, Assembly Section. If no response is required, the document will be filed in the record storage area, Assembly Section (box 18).

If a non-automated FBI number is provided the document will be processed completely in the manual system. But, if an automated FBI number is provided for a document, then a response is generated and/or a file is updated automatically in AIDS II.

Document processing takes place in the manual system through uncoordinated chains of serial-parallel-serial network stations; i.e., all fingerprint cards of the same category have to go through the same serial work stations after being processed through parallel work stations. Thus, a tentative identification on a fingerprint card will always go through the Incoming Work Unit of the Assembly Section after being processed in the Card Index Section (single criminal master fingerprint goes to Technical Section). A non-identified fingerprint card will always go to the Sorter's Desk of the Technical Section

WITH FBI #'s

CONTRIBUTORS

INCOMING MAIL

① SORT MAIL

FINGERPRINT CARDS

③ REVIEW AND DATE STAMP

WITHOUT FBI #'s

④ PRIMARY AND SECONDARY CLASSIFICATION

UNDER CUTOFF AGE

⑤ SUBJECT SEARCH

DISPOSITIONS AND MISCELLANEOUS DOCUMENTS

RETURNED PRINTS (INCOMPLETE DATA)

OVER CUTOFF AGE

WITHOUT FBI #'s

UNDER CUTOFF AGE

⑯ SUBJECT SEARCH

② ROUTE

WITH FBI #'s

WITH AUTO FBI #'s

NON-AUTO FBI #'s

LEGEND

— — — AIDS II

2/25/80

HOLDOUT FRAME

PRIMARY SECONDARY CATION

OVER CUTOFF AGE → ⑥ NAME SEARCH

UNDER CUTOFF AGE

⑤ SUBJECT SEARCH

NON-IDENTS

IDENTS (NOT ⊚ MASTER) → Ⓐ

IDENTS (⊚ MASTER) → Ⓑ

IDENTS (⊚ MASTER)

IDENTS (NOT ⊚ MASTER) → Ⓐ

NON-IDENTS

ILLEGIBLE RETURNS

⑦ MASTER PRINT PULLED FROM FILE

⑧ TECHNICAL SEARCH

ILLEGIBLE RETURNS

⑨ IDENTIFICATION AND VERIFICATION

IDENTS → ⑩ VERIFICATION

NON-IDENTS

⑰ NAME SEARCH → IDENT AND NON-IDENT

RESPONSE NOT REQUIRED → ⑱ FILING

RESPONSE REQUIRED   IDENT → ⑱a PULL JACKET FROM FILE

NON-IDENT

⑯ SUBJECT SEARCH → IDENT AND NON-IDENT

RESPONSE NOT REQUIRED → ⑱ FILING

RESPONSE REQUIRED → ⑱a PULL JACKET FROM FILE

FOLDOUT FRAME 2

Figure 4-1. Current Systems Functional F...

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after being handled in the Card Index Section. A print will go through the Card Index Section after being blocked out in the Recording Section.

B.   AIDS II

Within AIDS II, contributor requests fall into two general categories: (1) requests that require presearch as a separate step, intended to determine whether or not a subject and his associated records are in the automated data base, and (2) those that do not require presearch as a separate step but rather are for file update and/or response generation.

In general, requests requiring presearch as a separate step are taken from fingerprint cards and forms for wants, flashes, and miscellaneous requests. All documents taking that path (Figure 4-2) are assigned a process control number (PCN), followed by tagging, blocking out, and keying functions at the minicomputer level. Verification of keying, for non-idents, is done to validate all the identification entries taken from the source document. At that point, if everything has been properly entered, data are transmitted from the minicomputer to the (370/155) system using an interactive video terminal. The interactive capability is restricted mainly to subject search. The response is transmitted back to the CRT through the minicomputer. The result of the search will be: identification, no identification, or multiple identification. The transaction involves interrogation of the CCNR file by using FBI number, Social Security number, originating agency number, name, sex, date of birth, and preliminary fingerprint classification as search parameters. Subsequently, a current fingerprint card will be either tentatively identified and, therefore, sent to either Technical Section if only one prior arrest is on file or to Assembly Section for positive identification and verification, or not identified and sent to the Technical Section for fingerprint searching. After the manual processing takes place with the result being either a positive identification or the subject being a first offender to be added to the automated data base, the Data Entry Unit enters the arrest or custody data for the postsearch purposes. The new data is merged with the data which were entered when the subject search was performed, and then posted to the TRC files. At this point, the on-line capability of AIDS II, with the exception of minor urgent transactions, terminates. Batch process, from that point on, will proceed for file update and response generation. Periodically (every two hours) the AIDS II data base is updated and responses are generated during file update. The generated reports are checked for accuracy and completeness and then forwarded to the mail room in the Fingerprint Correspondence Section. Index cards are generated and sent to the Card Index Section for addition to the manual file.

Certain types of transactions such as dispositions will not require presearch as a separate step but rather both steps, presearch and postsearch activities, will be done in a single step.
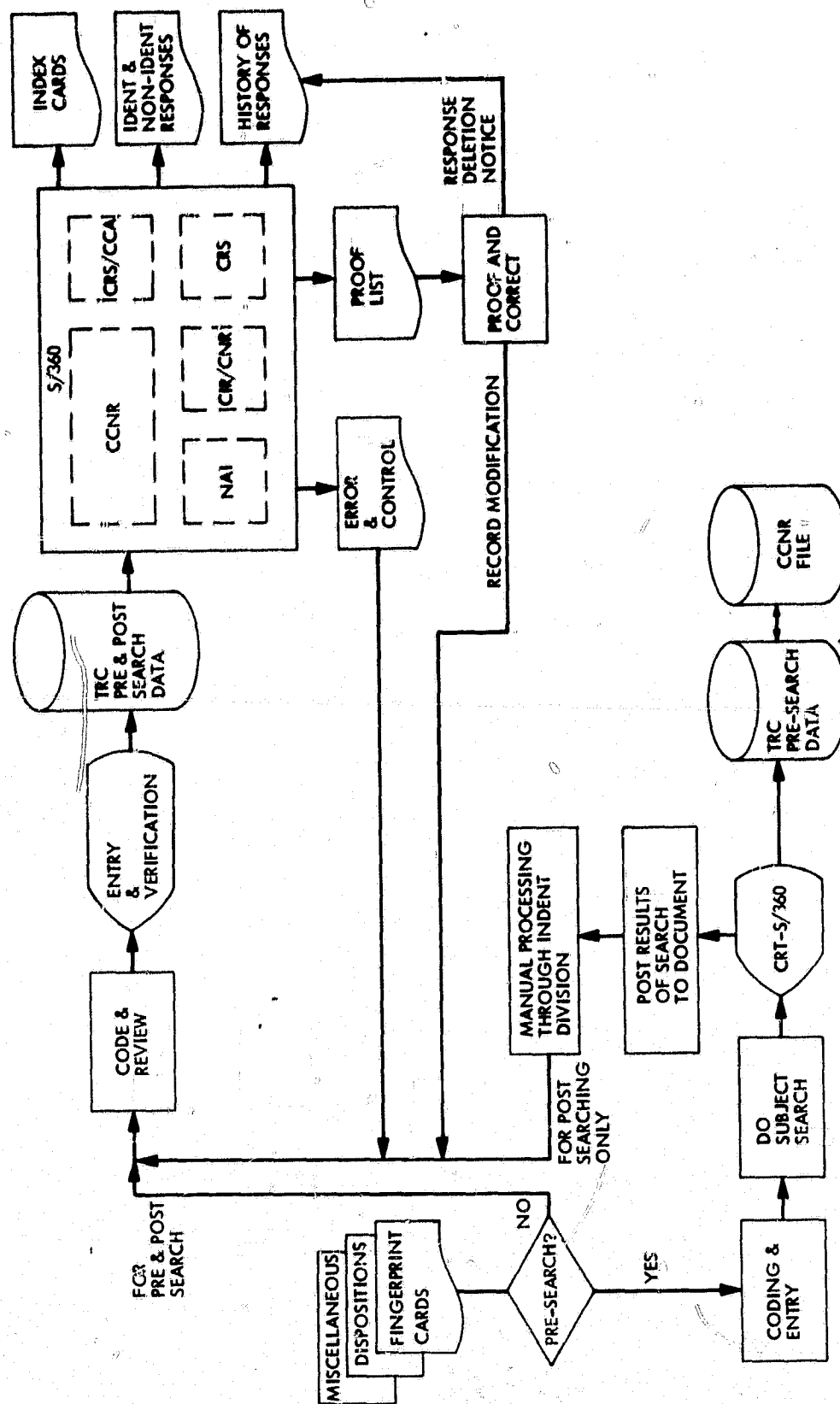
Figure 4-2. AIDS II Processing Flow

Three types of responses are generated by AIDS II:

(1) Identification and non-identification responses.

    (a) Identification responses with arrest history and disposition data of the subject.

    (b) Non-identification with notation that subject does not have prior arrest data on file.

(2) Notification to contributors of items such as expungements.

(3) Index cards for all identifications, non-identifications, and corrections to existing data.

SECTION V

WORK LOADS AND MEASUREMENTS

A.   METHODOLOGY OF MEASUREMENTS

In the Identification Division, all of the work related to fingerprints (classifying, searching, identifying, filing, etc.) is broken down into a large number of steps which are performed by various units. Within each unit several functions may be performed, and each function may be performed by several servers in parallel. Figure 5-1 shows a hypothetical Identification Division work unit. Arrivals approach the work unit according to some distribution. If service cannot begin immediately, a queue forms. Within the work unit, the different functions are represented by the subscripts i-L. Each task is handled by one of the servers working, in turn, on a particular function. Eventually, the work moves through the unit and on to the next appropriate unit.
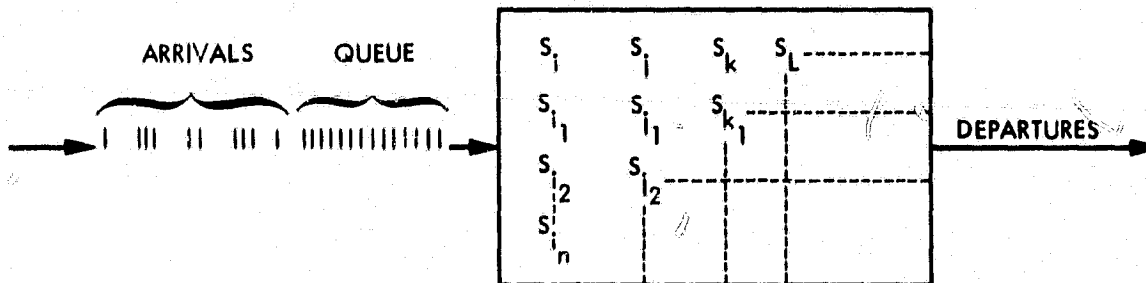
Figure 5-1.   Hypothetical Identification Division Working Unit
Queueing System

As the system was investigated, it was observed that arrivals were in batches and not individual pieces of work. This is reflected in Figure 5-2.

Due to the large number of servers and functions within each unit, and the very large number of possible paths within a unit, it was decided to simplify the model by treating each work unit as a "black box." Measurements would be taken for the unit as a whole without being overly concerned about the contents of the black box. This approach is shown in Figure 5-3, which also lists the desired data to be acquired for each unit.

In order to collect the desired data listed on Figure 5-3, form 311-02 was designed (Figure 5-4). Counts of work received or processed were to be made on an hourly basis as indicated under the "Time" column. Thus, an entry beginning with 3 o'clock would reflect
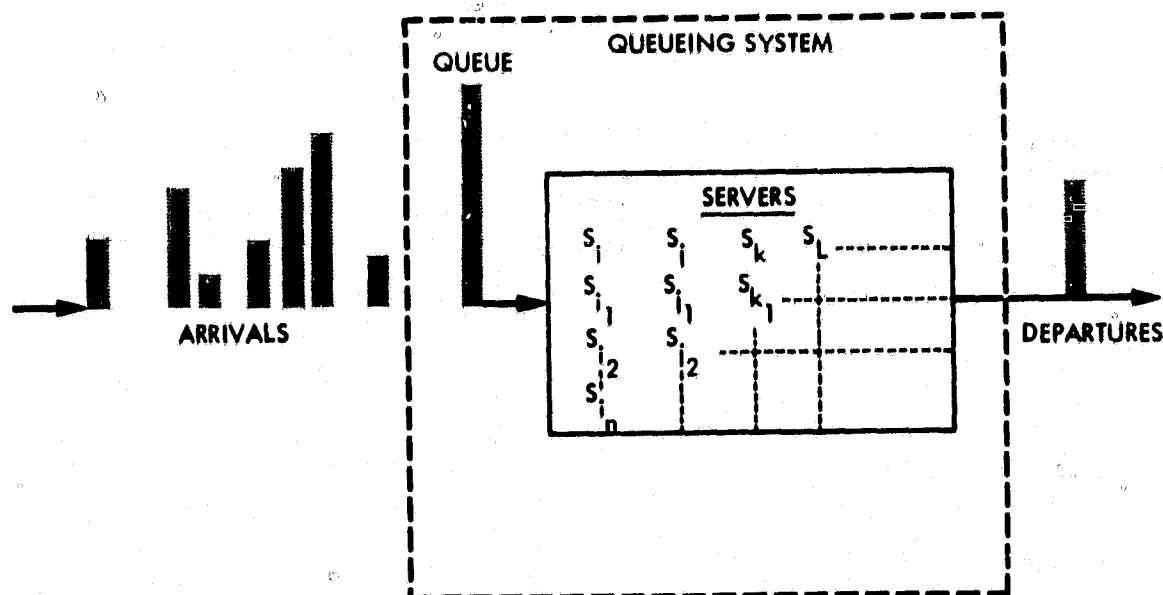
Figure 5-2. A Realistic Representation of Identification
Division Working Unit Queueing System

DATA GATHERED:

- ARRIVALS/HOUR/TYPE/PRIORITY
- DEPARTURES/HOUR/TYPE/PRIORITY
- INPUT PATH
- OUTPUT PATH
- MEASUREMENT BIAS
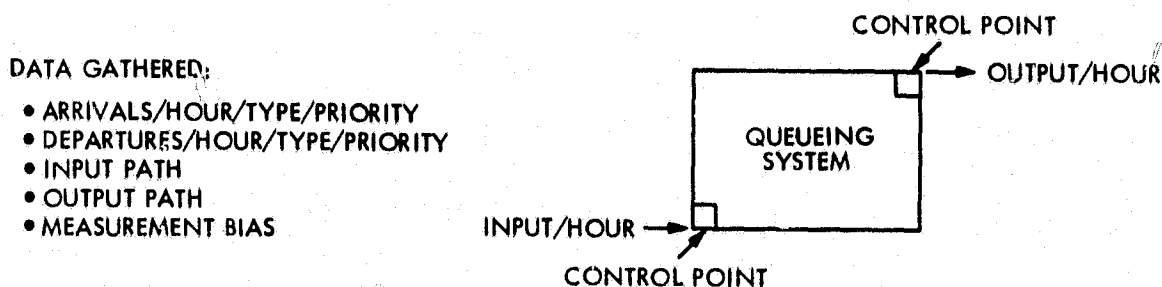
Figure 5-3. Data Gathering Technique for a Working Unit

counts made during the period 2 o'clock to 3 o'clock. The
"Input/Output" column indicated whether a given count was for work
received during the hour or work that had been processed and sent to
another unit during the hour. The "Priority Level" column indicated
the degree of urgency for performing the work. By far the two largest
categories were level 2, routine criminal fingerprints, and level 4,
applicant fingerprints. The "Civil or Criminal" column is
self-explanatory and the "Number of Units" column was used only for
special codes.

5-2

Figure 5-4. Measurement Form 311-02 Used in JPL FBI Study

The "Paths" column was used to indicate the source and destination of work handled by each unit. Each section was assigned a number and work coming from or going to a given section had the appropriate column checked. Units within a section also used the same numbers for the same purpose. A special flag in the "Error" column would signal that path numbers referred to units rather than sections.

The "Error" column was used, as described above, to signal special meaning for path numbers and it was also used to indicate errors that occurred inside or outside of a given unit.

The final (untitled) column was used to represent counted quantities. Thus, one line would show the following:

(1) The end of a one-hour period.

(2) The number of pieces of work (last column).

(3) Whether the work was received or sent out.

(4) The priority level.

(5) Whether the work was civil or criminal.

(6) The source or destination of the work.

A separate line was required for each batch of work with any characteristics changed. Thus, the number of lines required for each hour might be considerable if a unit had several priority levels of input from and output to several different units or sections.

The "black box" concept was not sufficient for certain critical fingerprint card processing functions. Therefore, stopwatch time measurements were taken inside the black box in the Recording, Card Index, Assembly, Technical, and Fingerprint Correspondence Sections.

The measurements are reported under items V-E and V-F of this report. Also, a survey questionnaire was designed to gather pertinent, quantitative information relative to various unit functions. It was presented and explained in an assembly of unit supervisors.

The questionnaire retrieved data on the number of employees per function, equipment required, number of work reviews, time required to correct errors, and the number of years the unit supervisors have been with the Identification Division.

B.   DAILY VOLUME

For the purpose of this report the mean daily volumes of fingerprint cards and other miscellaneous documents handled in most of the units of the Identification Division are reported in Appendix A.

The volume is derived as such:

$$V_D = \frac{1}{M} \sum_{i=1}^{M} \sum_{j=1}^{N} V_j$$

where V_j is a single hourly interval for a single day;
e.g., $j=1$ 6:00-7:00 a.m., $j=2$ 7:00-8:00 a.m.

N is the total number of hours in a work day.

M is the total number of days data were collected.

Each page of the listing presents input and output data (I-O) representing document arrivals or departures. Quantities are broken down to two types under DOCUMENT TYPE: Civil and Criminal. The number of days of data collection is shown under "NUMBER OF DAYS." MEAN DAILY VOLUME represents the total volume of data collected divided by the "NUMBER OF DAYS." The DAILY MEAN BY TRANSACTION represents the total for inputs or output, respectively.

The output taken over a period of one week reflects the productivity of the unit. The input-output difference may point to a severe queueing problem. Most work loads of the Searching Units in the Technical Section are examples of imbalance between input and output, indicating the presence of large queues. (In Appendix C Tables C-2 and C-3 show work load and file size statistics obtained from the Identification Division.)

C.   HOURLY VOLUME

The MEAN HOURLY VOLUME represents the overall average of transactions that went through each reported unit on an hourly basis (see Appendix B). It is derived as such:

$$V = \frac{1}{M \times S} \sum_{i=1}^{M} \sum_{j=1}^{N} V_j$$

where S is the length of work shift in hours taken, either 7.5 for single shift units or 15 for double shift units.

V_j, M, and N are the same as before.

The NUMBER OF DOCUMENTS is the total number of transactions over the period data were collected. The MIN HOURLY VOLUME and the MAX HOURLY VOLUME represent the extremes of measured volume.

D. ARRIVAL AND DEPARTURE DISTRIBUTIONS

The input and output volume of document volumes measured on an hourly basis for individual operating units provided data to construct histograms of frequency distributions of arrivals and departures.

Several units along the mainstream of document flow were chosen to determine the type of probability distributions of arrivals and departures. Once distributions are determined then it will be possible to compute average queue sizes, average in-queue time, and the utilization of servers.

Since arrivals and departures occur in variable size batches, the x-axis of the histograms was divided into ranges of discrete units with magnitudes suitable for display on 8 1/2 in. x 11 in. documents. (See Figures 5-5 through 5-12.)

The number of sampling hours (N), the sample mean (x), the standard deviation (σ), and the number of servers (S) are displayed on the upper right side of each histogram. Some data points were not shown in the histogram but were included in the calculation of the mean and the standard deviation.

All histograms exhibited a considerable degree of randomness which characterizes Poisson distributions of discrete random events. For example, in Figure 5-5, the expected Poisson frequency distribution was superimposed on the histogram of the empirical data to show if there is any congruency between the two distributions. The expected Poisson frequencies were generated using the following algorithm:

$$P \text{ (n FP arrivals/hr)} = \frac{\lambda^n}{n!} e^{-\lambda}$$

where P = probability of n fingerprint (FP) arrivals per hour

λ = the mean FP arrival rate per hour

Since 43 hours are being studied:

Frequency = P(n) x 43

A scaling factor of 500 to 1 (which approximates the average batch size) was used to normalize the hourly ranges. The average arrival rate is:

$$\frac{1402}{500} = 2.804 \text{ batches of 500 fingerprints/hour}$$
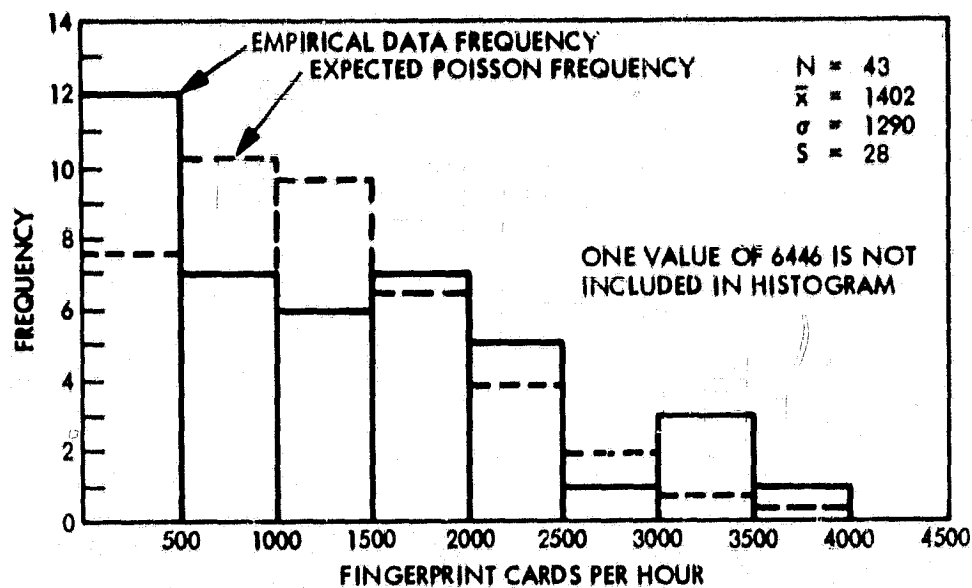
Figure 5-5. Hourly Arrival Rate, Applicant Fingerprint Cards, Blocking Out Unit, Recording Section
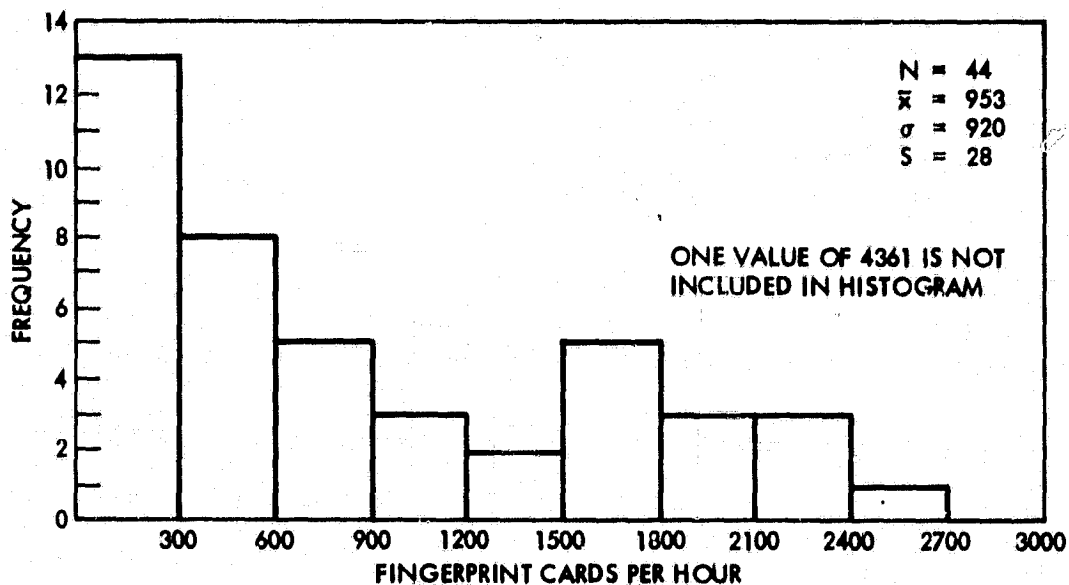
Figure 5-6. Hourly Arrival Rate, Criminal Fingerprint Cards, Blocking Out Unit, Recording Section
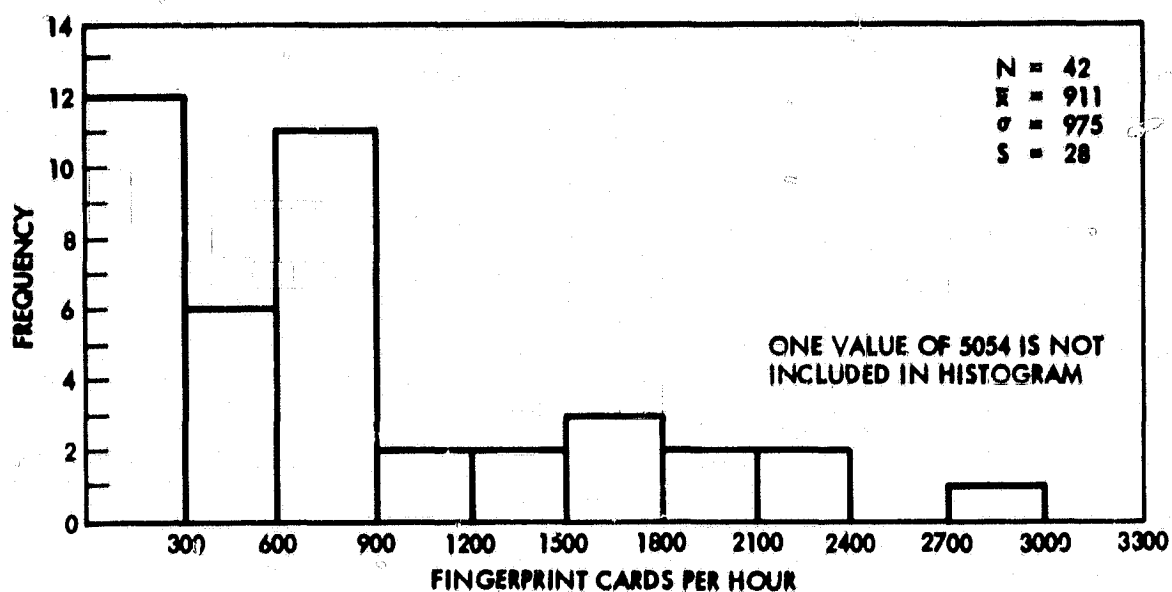
Figure 5-7. Hourly Departure Rate, Criminal Fingerprint Cards,
Blocking Out Unit, Recording Section
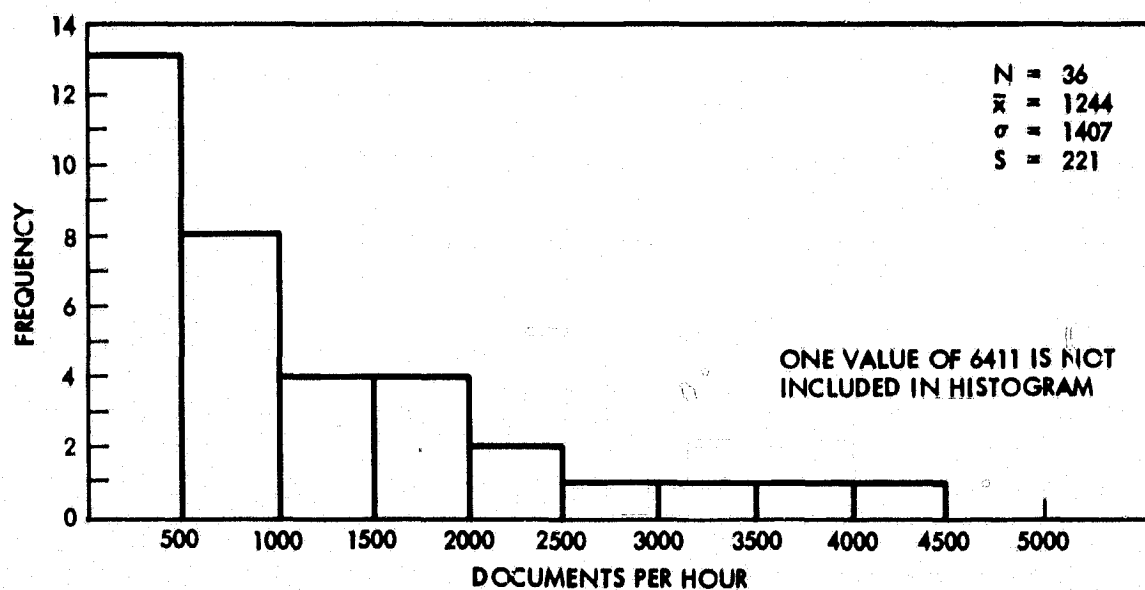
Figure 5-8. Hourly Arrival Rate, Applicant Fingerprint Cards,
Current Work Units, Card Index Section
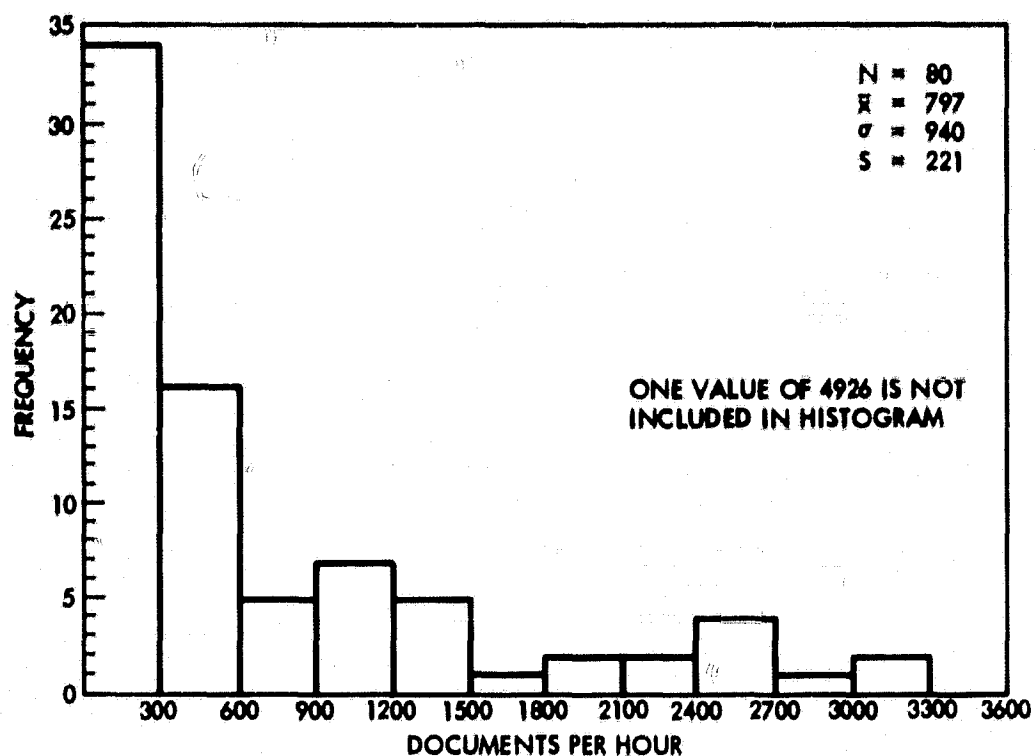
Figure 5-9.   Hourly Departure Rate, Applicant Documents,
Current Work Units, Card Index Section
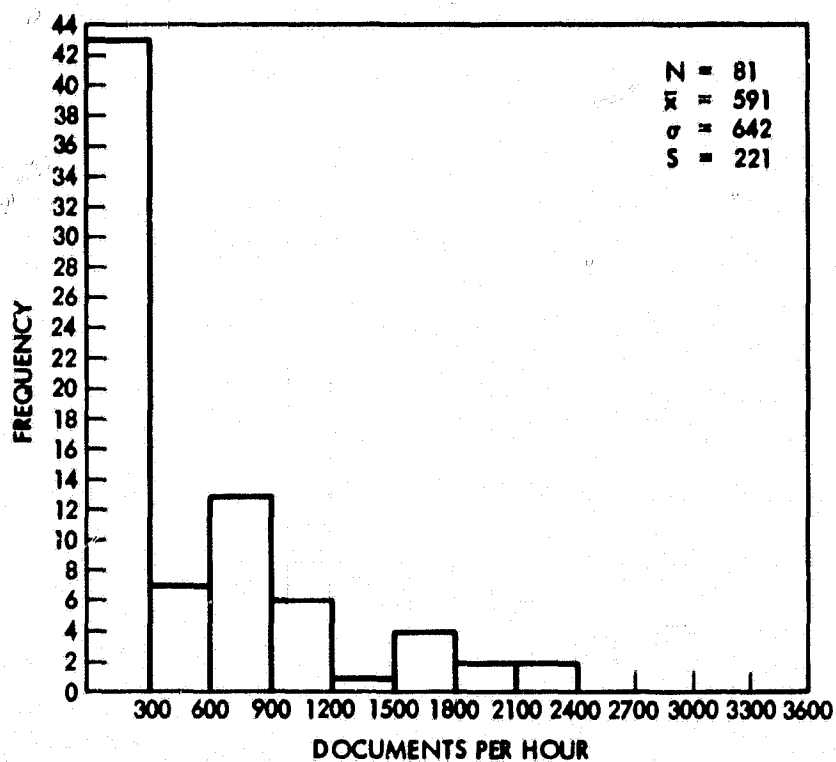
Figure 5-10.   Hourly Departure Rate, Criminal Documents,
Current Work Units, Card Index Section
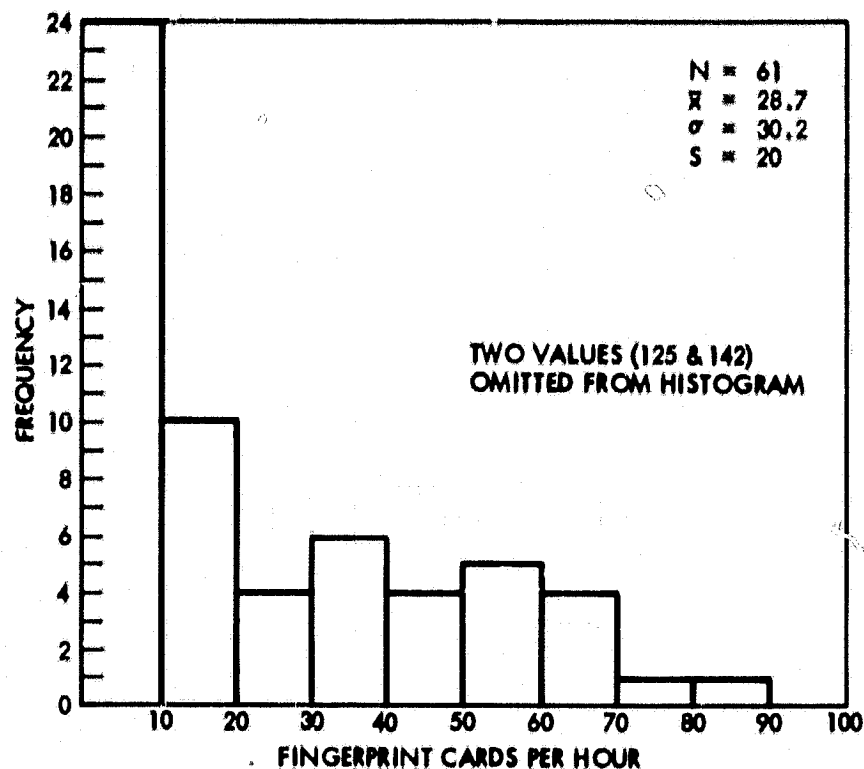
Figure 5-11. Hourly Departure Rate, Criminal Fingerprint Cards, Search Unit, Technical Section
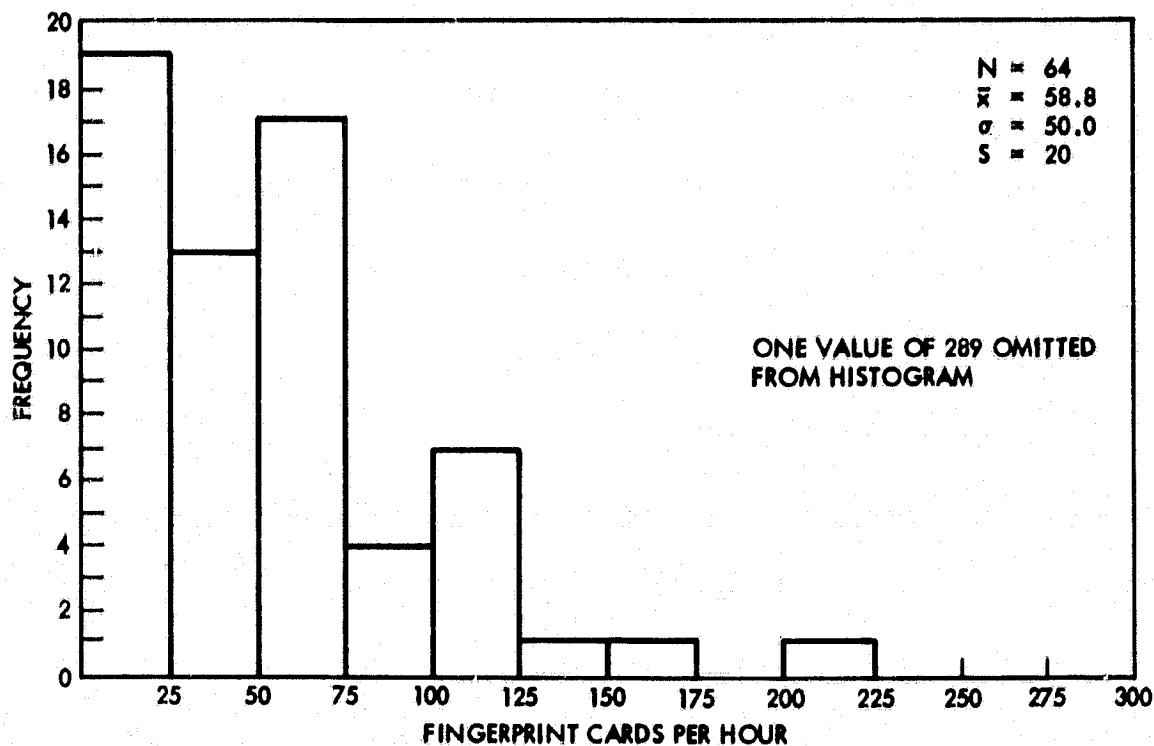
Figure 5-12. Hourly Departure Rate, Applicant Fingerprint Cards, Search Unit, Technical Section

Then for 500 arrivals/hour:

$$P(n) = \frac{(2.804)^1}{1!} \times e^{-2.804}$$

$$P(n) = 0.1698$$

$$f = frequency = 0.1698 \times 43 = 7.3$$

For n different arrivals, the frequency values (f) are computed and presented in the following table:

n	f
1000	10.24
1500	9.57
2000	6.71
2500	3.76
3000	1.76
3500	0.65
4000	0.25

The two frequency plots (empirical and Poisson) on Figure 5-5 indicated that the arrivals of applicant fingerprint cards at the Blocking Out Unit follow a Poisson distribution.

A Kolmogorov-Smirnov (K-S) test at 0.05 significance level was conducted. The result indicated that there is no significant difference between the observed data and Poisson distribution (Appendix D).

A number of operating units' arrivals and departures using the K-S goodness-of-fit were also tested. The results were not uniform; some units had Poisson distribution arrivals and departures while others had Gaussian distribution for arrivals and departures. The Gaussian distribution may be attributed to the integration of exponential mean service times for multifunction units.

E.   SERVICE TIMES

Mean service times of a single server of mainstream functions are shown in Table 5-1.

F.   TRANSPORT SYSTEM

Moderately large quantities of material (fingerprint cards, criminal history records, correspondence, etc.) can be sent from one section to another by means of the Telelift system. Although this system serves the entire Bureau, the portion serving the Identification Division has only minimal interface with the rest of the system.

Table 5-1. Mean Service Times (in Seconds)

Function	Service Time
Recording Section	
Check for completeness	3
Recheck	3
Tag	1
Sort	2
Block Out	20
Check	2
Card Index Section	
Sort	8
Search (ident)	122
Search (non-ident)	48
Check	5
Assembly Section	
Sort	3
Sequence	4
Pull jackets	25
Ident	55
Current work check	45
Verify	35
Technical Section	
Check legibility	3
Sort	4
Classify	150
Search (ident)	120
Search (non-ident)	630
Fingerprint Correspondence Section	
Type	450
Read	180
Photocopy	30
Assemble	50
Prepare response	60
Automation and Research Section	
Sort	3
Assign PCN	1
Code	60
Read	30
Type	100
Check	75

The system (within the Identification Division) is composed primarily of a continuous, one-way loop of electrified track which is suspended just below the ceiling. The cars which use the track are approximately 1 ft x 1 ft x 1-1/2 ft. Each car is independently powered and travels at approximately 2.5 feet per second. Branching from the central loop are spurs which may serve a single station or loops which may cover all or part of an entire floor before rejoining the central loop. The side loops have their own spurs serving various stations and in a few instances the side loops may interconnect. Each car may easily be programmed to go to any other station by simply setting three magnetic switches on the top of the car. These switches are automatically read at various key points and the car is automatically routed along the shortest path to its destination.

Since the loop is one way, the trip from A to B may be considerably shorter than the trip from B to A. The longest trip within the Identification Division is from the Card Index Collection Unit to the Fingerprint Correspondence Station and takes approximately 11.5 minutes.

Table 5-2 shows transportation times in minutes and seconds between various work stations.

G.   RESPONSE TIMES

In order to determine the total response time of processing fingerprints in the Identification Division, a battery of samples were taken at random on December 17, 1979. Also, on May 7, 1980, another larger size battery of samples were taken at random. The sampling stations were the mail rooms of Fingerprint Correspondence. Since each fingerprint is date stamped when it enters the Recording Unit of Recording Section, determining the total response time a single fingerprint spent in the Identification Division is the difference between the date of sampling and the date of entry to the system in calendar days.

The frequency distribution of response times of each category of fingerprints for the two sampling periods are shown on Figures 5-13, 5-14, 5-15, and 5-16. Table 5-3 lists the sample size, the mean, and the standard deviation of response time samples.

The frequency distributions appear to approximate normal (Gaussian) distribution, which is an expected result of integrating distributions of various processing stages. Moreover, the frequency diagrams clearly indicate that the mean response time of May 7, 1980, samples has significantly been shifted from the mean response time of December 17, 1979, samples. This shift can be attributed to the overtime effort during the Summer of 1979. After overtime work stopped, response time continued to increase gradually between October of 1979 and May of 1980.

Table 5-2. Telelift Transportation Times
(in Minutes and Seconds)

Location	Time
Tech Sorter's Desk (7)[a] to:	
(Technical Search)	
(1) Fingerprint Correspondence Sort (9) (File update and response generation)	0:40
(2) Fingerprint Correspondence Mail Room (10, 11, 9)	6:51
(3) Automation and Research Sort (10, 11, 2, 9) (AIDS II, data entry)	5:00
Card Index Collection Unit (11) to:	
(Name Search)	
(1) Tech Sorter's Desk (10, 2, 7)	10:57
(2) Fingerprint Correspondence Sort (10, 2, 7, 9)	11:33
(3) Automation and Research Sort (10, 2, 9)	9:39
(4) Assembly (10) (Record storage, identification, and verification)	5:37
Fingerprint Correspondence Sort (9) to:	
(1) Tech Sorter's Desk (10, 2, 7)	5:12
(2) Mail Room (10, 11, 9)	4:55
(3) Automation and Research (10, 2, 9)	4:16
(4) Assembly (10)	0:24
(5) Card Index Collection Unit (10, 11)	2:21
Automation and Research Sort (9) to:	
(1) Tech Sorter's Desk (2, 7)	4:21
(2) Assembly (11, 10)	5:09
(3) Card Index Collection Unit (11)	1:03
Assembly (10) to:	
(1) Tech Sorter's Desk (2, 7)	7:36
(2) Fingerprint Correspondence Sort (2, 7, 9)	8:12
(3) Automation and Research Sort (2, 9)	6:40
(4) Card Index Collection Unit (11)	4:45

[a]The number in parentheses designates floor level in the FBI building.
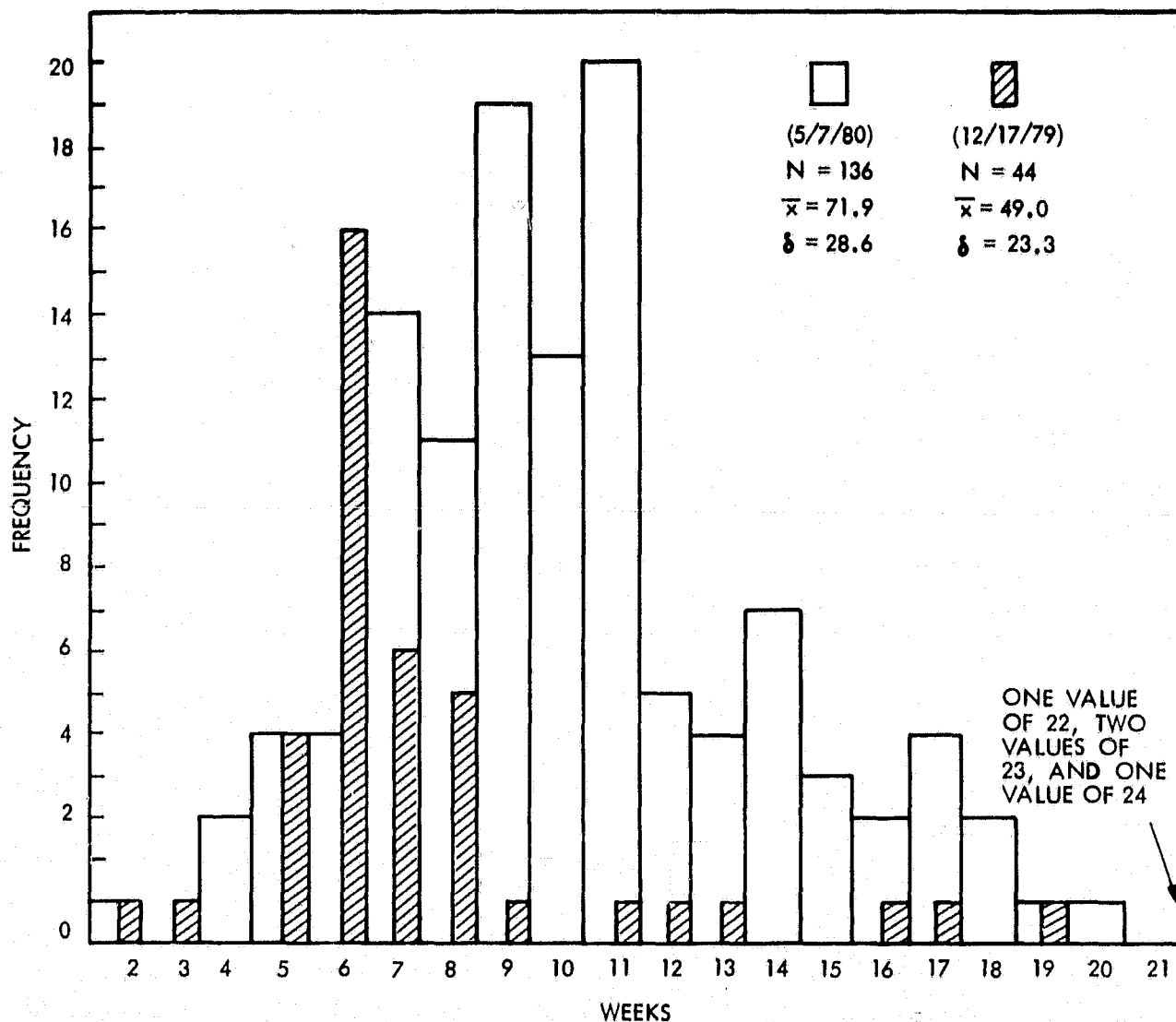
Figure 5-13. Response Times – Criminal Ident Prints
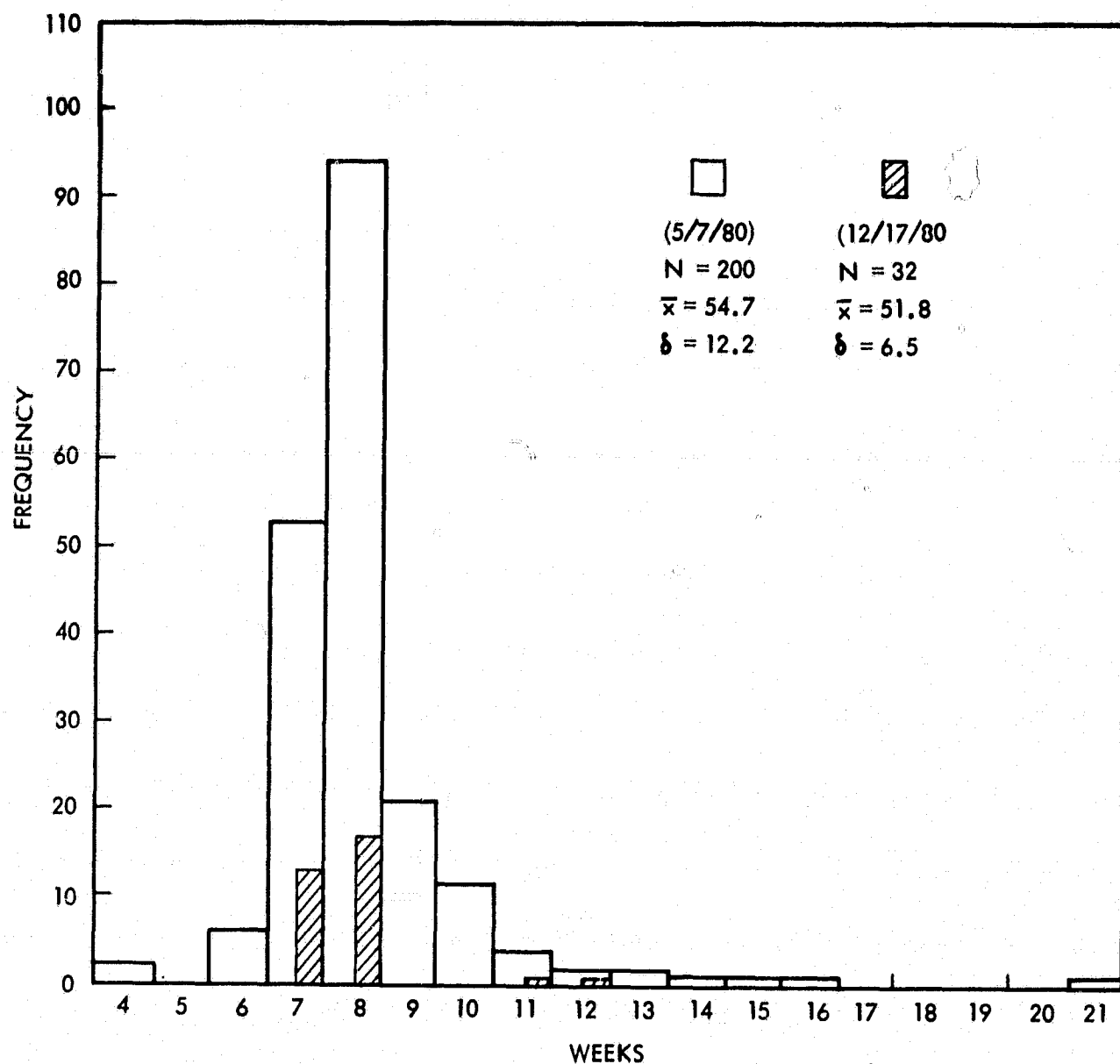
Figure 5-14. Response Times - Criminal Non-Ident Prints
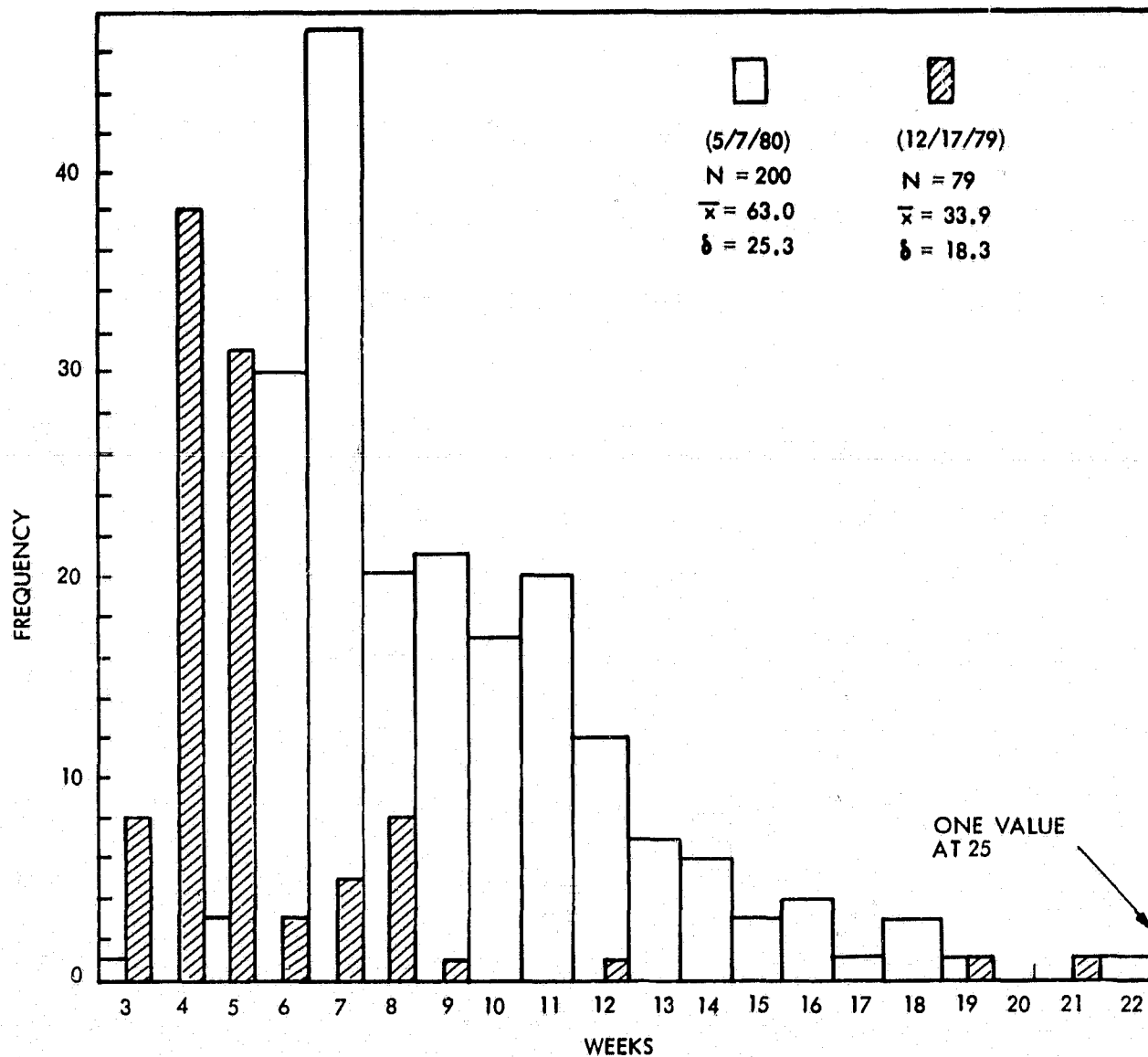
Figure 5-15.   Response Times - Applicant Ident Prints

5-17
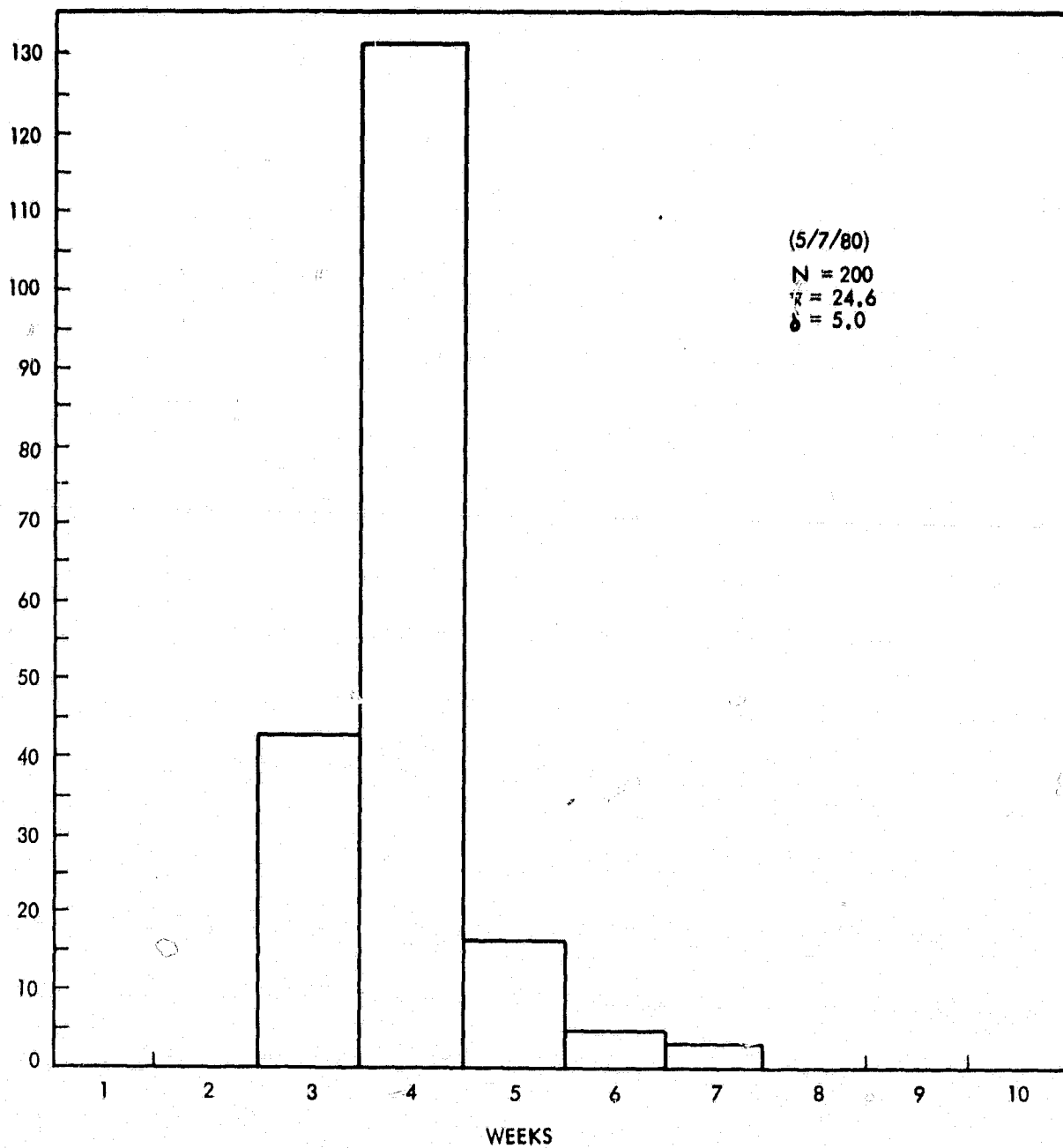
Figure 5-16. Response Times - Applicant Non-Ident Prints

Table 5-3. Response Times

	CRIMINAL		APPLICANT	
	IDENT	NON-IDENT	IDENT	NON-IDENT
FIRST SAMPLE (12/17/79)	N = 44 $\bar{x}$ = 49.0 δ = 23.3	N = 32 $\bar{x}$ = 51.8 δ = 6.5	N = 97 $\bar{x}$ = 33.9 δ = 18.3	
SECOND SAMPLE (5/7/79)	N = 136 $\bar{x}$ = 71.9 δ = 28.6	N = 200 $\bar{x}$ = 54.7 δ = 12.2	N = 200 $\bar{x}$ = 63.0 δ = 25.3	N = 200 $\bar{x}$ = 24.6 δ = 50

WHERE:

N = SAMPLE SIZE

$\bar{x}$ = MEAN

δ = STANDARD DEVIATION

SECTION VI

HUMAN RESOURCES

A. DIVISION EMPLOYEES

The current operation of the Identification Division is labor-intensive; 80% of the budget (FY 79) expenditure goes to employee wages, benefits, and overtime.

The Division recruits high school graduates from various rural parts of the country at the entry level (GS2) without any previous experience requirements. Training to perform various functions is provided, in-house, by instructors attached to each of the Identification Division sections. During FY 79 the average total number of employees -- excluding special agents -- was 3399. This number is considerably volatile because of the high turnover rate (31%) with monthly variation of as many as 150 employees. Because of budget constraints and a quota ceiling, the average number of employees over the last nine years has been about 3214, with 3018 employees at the lower end of the range and 3399 at the higher end.

The bulk of the employees (79%) work the day shift, 20% the night shift, and 1% the midnight shift and weekends. Table C-1 of Appendix C presents Identification Division employee monthly counts from January 1970 through August 1979.

Table 6-1 is a summary of Division employees by section and GS level. It is important to note that about 200 of the Technical Section employees are assigned to other sections such as Automation and Research, Recording, Assembly, and Fingerprint Correspondence.

Division employees (FY 79) by current activities:

System	Number of Employees
Manual System	2580
AIDS II	392
AIDS III TFC	241
Latent FP	154
Front Office	32
Total	3399

It is to be noted that the number of employees for the all-manual system in 1971 was 3282 compared with 2580 employees for the mostly manual system in 1979 and before the start of AIDS II operation.

Table 6-1. Identification Division Employees by Section and Grade as of 9/28/79

Number of Employees by Section

GS Level	Assembly	A&R	Card Index	Fingerprint Correspondence	Front Office	Latent Fingerprint	Posting	Recording	Technical
15		1				1			
14		3				1			
13						10			3
12				1	1	44			1
11	1	4		1	1	44		1	7
10	2	3	2				1		14
9	1	7	1	3	1	9		1	50
8	3	5	1	11	3		1		52
7	4	31	10	52	2	2	5	5	313
6	9	99	11	32	7	7	8	8	206
5	8	152	13	206	3	3	33	12	193
4	58	165	80	77	10	31	63	49	246
3	136	62	279	24	12	7	6	37	234
2	48		30					2	
	270	532	427	407	40	159	117	115	1319

Grand Total 3386

B.   DIRECT LABOR FORCE

The Division employees who are directly involved in performing document processing are presented in Figures 6-1 through 6-9. Only first line supervisors are included in these figures. The letters D and N stand for day and night shifts number of employees.

C.   TECHNICAL STAFF

The Identification Division technical base is extremely small compared with its activities and programs. The four engineers and system analysts employed by the Division are primarily involved with the management of AIDS programs in the Automation and Research Section. However, the System Development Section of the Technical Service Division is providing most of the technical support in terms of hardware configuration, data base management, system support, software specification, and coding. Rockwell International is the contracting agency that provides the Identification Division with most of the designs for the automation of functions.

D.   WORKDAY

1.   Regular Hours

The normal workday in the Identification Division is from 7:00 a.m. to 3:30 p.m. for the day shift and from 4:30 p.m. to 1:00 a.m. for the night shift. Moreover, of the 8.5 hours per shift, there is a 30-minute lunch break and two 10-minute coffee breaks.

2.   Flexitime

The Identification Division management is testing a Flexitime program in an attempt to improve productivity and reduce the turnover rate. The program started on September 9, 1979, with Flexitime hours from 6:00 a.m. to 6:00 p.m. and core hours from 9:30 a.m. to 2:30 p.m. After 12 weeks of trial, less than 1% of the employees reported to work after 8:00 a.m. However, it is premature to comment on the impact of the Flexitime program on productivity and employee satisfaction until additional statistics are available.

3.   Compressed Work Schedule

Another program, called Compressed Work Schedule, is being tested with the night shift employees. It allows employees to work 10 hours a day, four days a week with either Mondays or Fridays off; or they may work 8 hours a day, five days a week. The program started on October 7, 1979 and lasted 90 days. Approximately 50% of the night shift employees chose a 3:30 p.m. to 2:00 a.m. Monday through Thursday work schedule. It is not known what the impact of this program will be because the data to determine its effectiveness are not yet available.

RECORDING SECTION
D=142

RECORDING UNIT
D=42

BLOCKING OUT UNIT*
D=28

EXPUNGEMENT AND CIVIL LIABILITY UNIT
D=30

CORRESPONDENCE AND INTERNATIONAL EXCHANGE UNIT
D=11

STATISTICS UNIT
D=4

TYPING UNIT
D=10

ADDRESSOGRAPH CODING
D=9

NAME CHECK UNIT
D=2

ROUTING
D=4

SUPPLIES
D=2

D = DAY

* DAY BLOCKING OUT UNIT IS A TECHNICAL SECTION UNIT OPERATING IN RECORDING SECTION
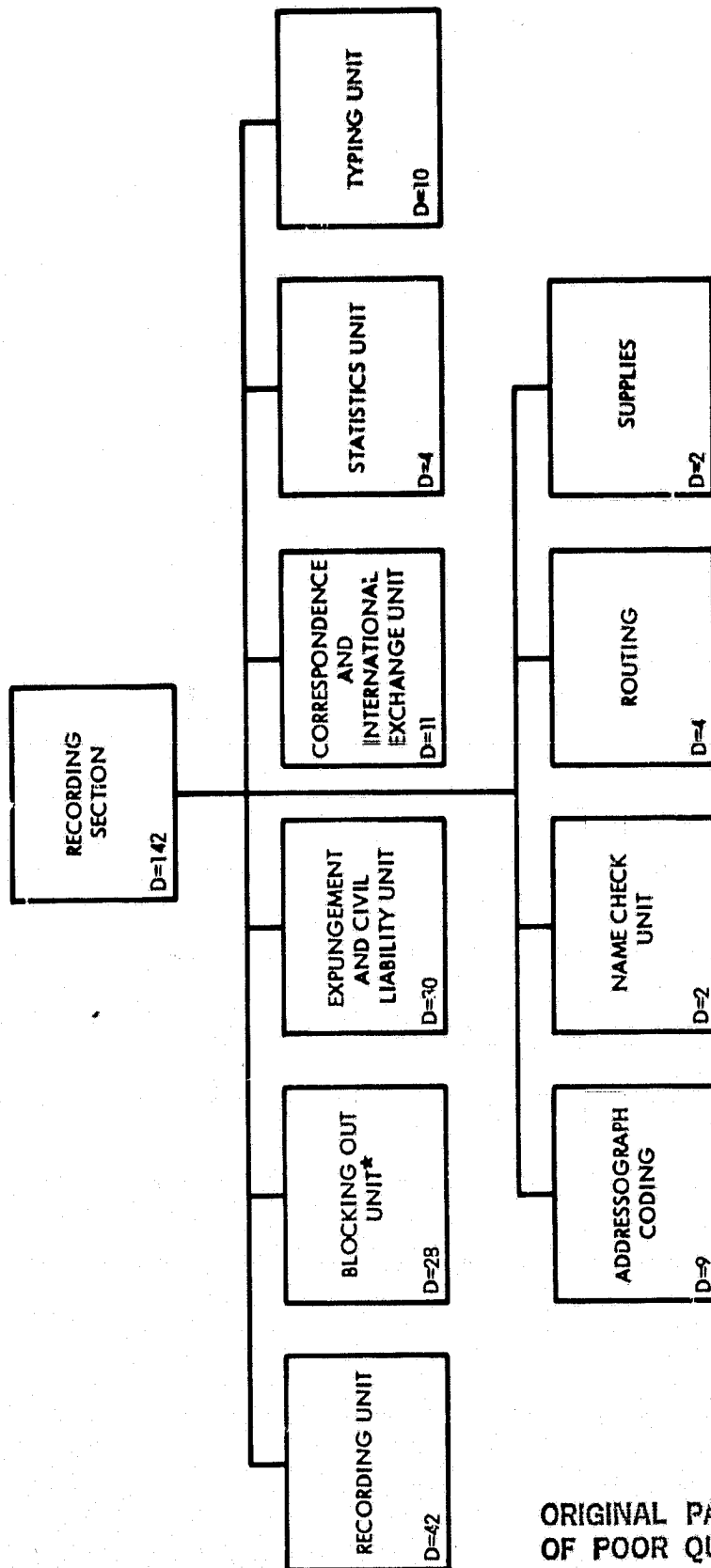
ORIGINAL PAGE IS OF POOR QUALITY

Figure 6-1. Recording Section Direct Labor Force
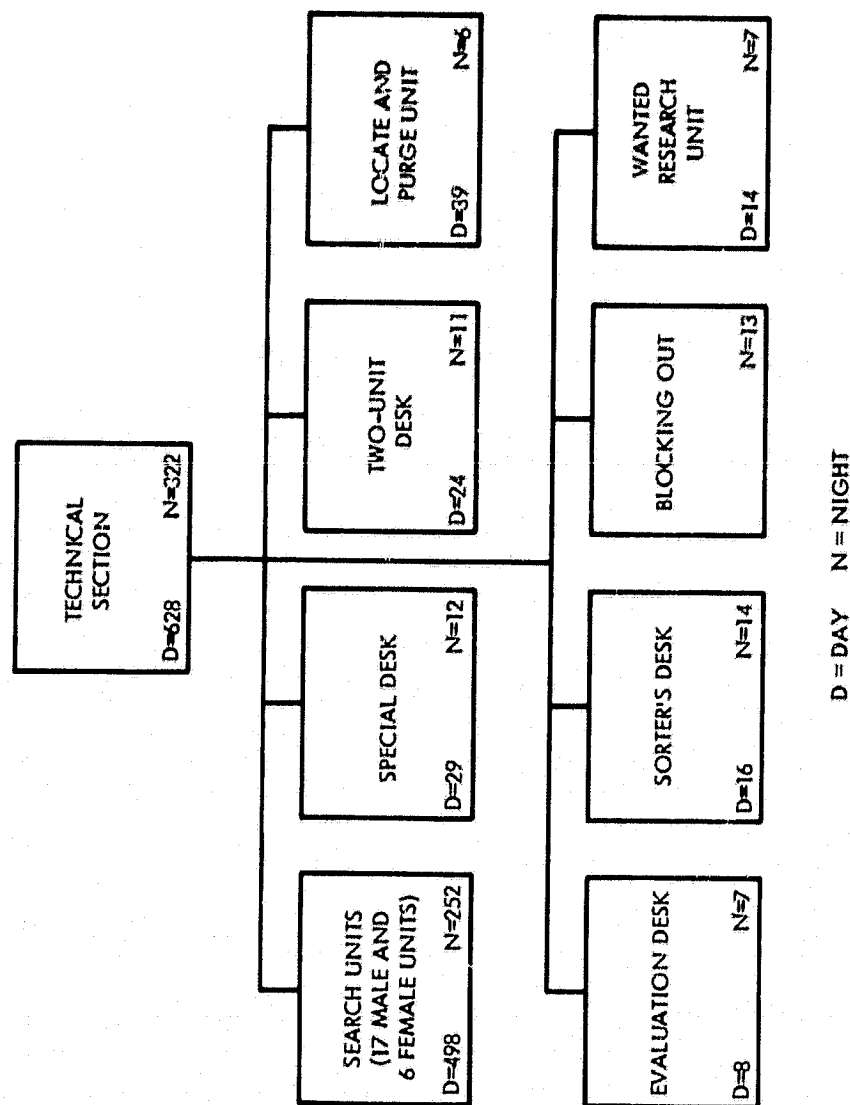
Figure 6-2. Technical Section Direct Labor Force
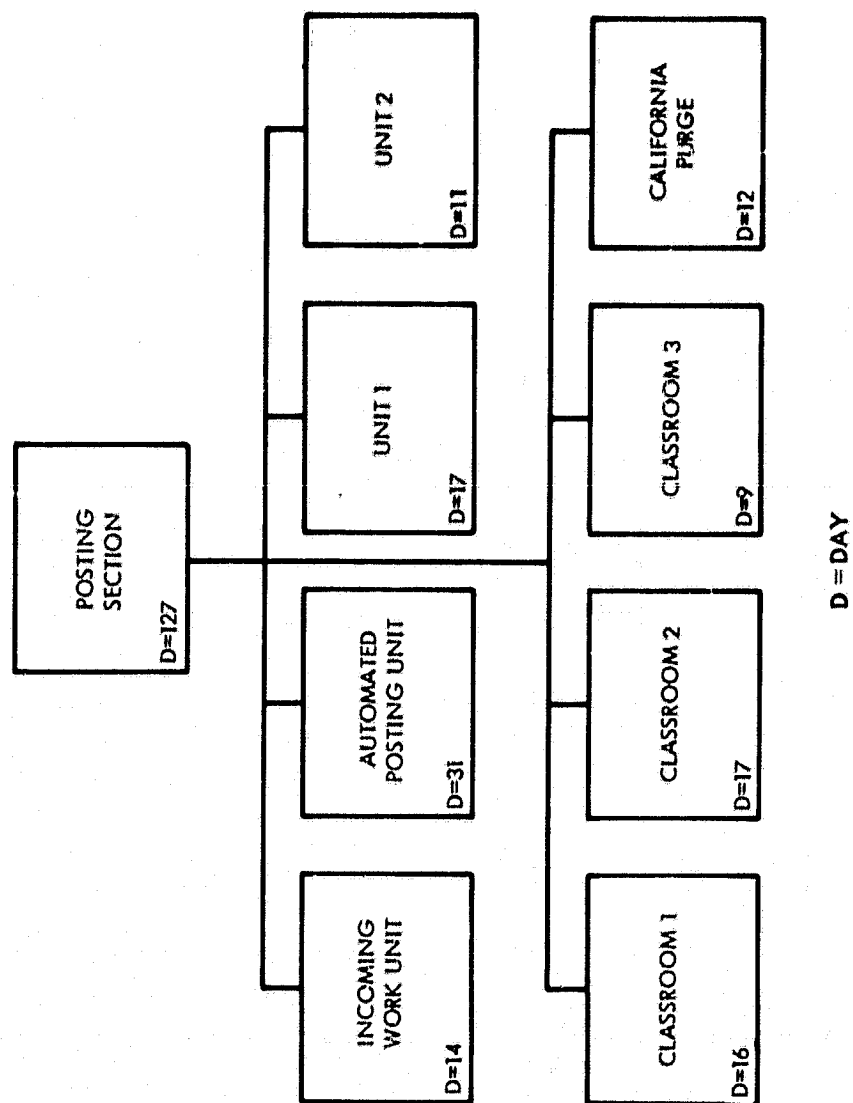
Figure 6-3. Posting Section Direct Labor Force
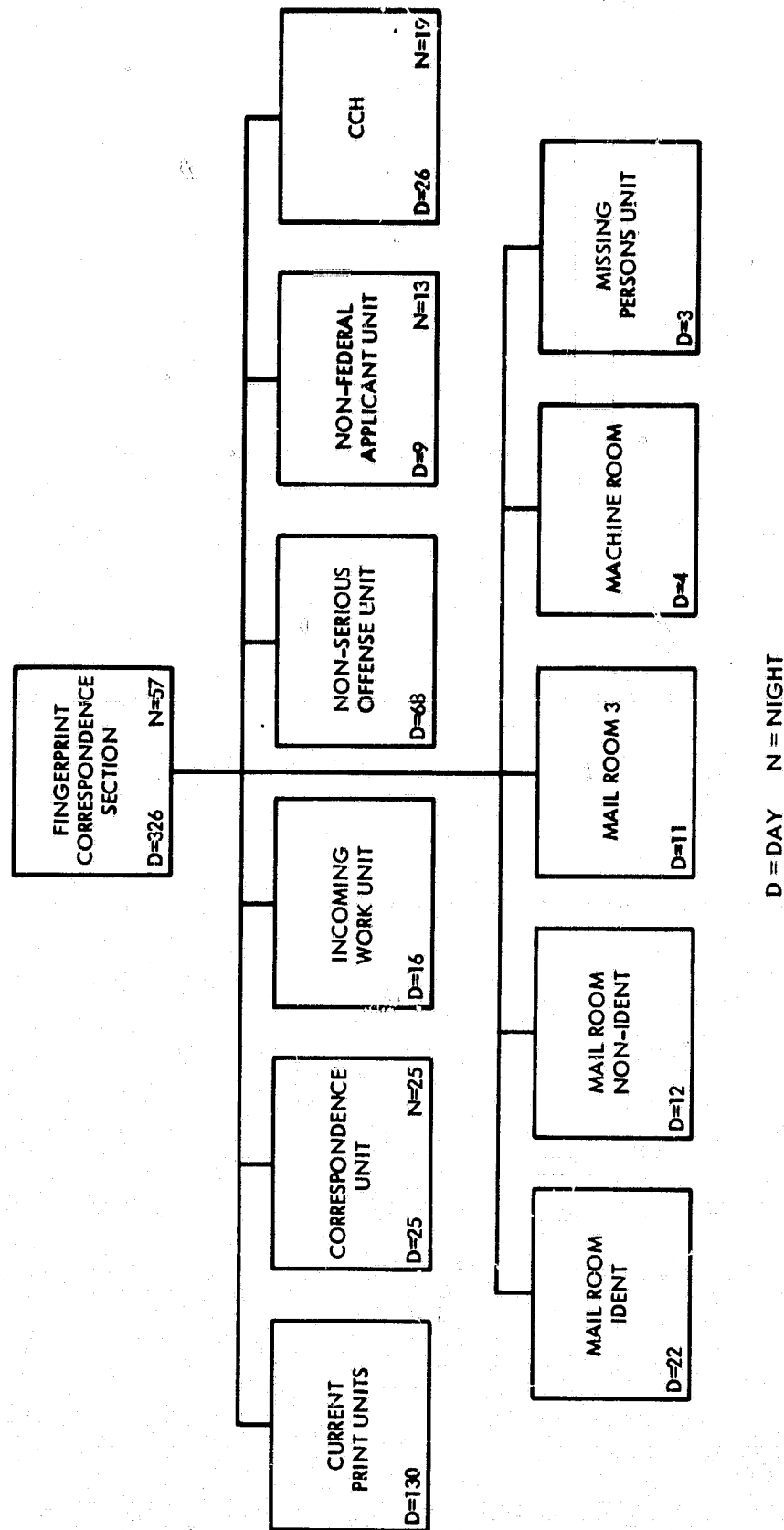
Figure 6-4. Fingerprint Correspondence Section Labor Force
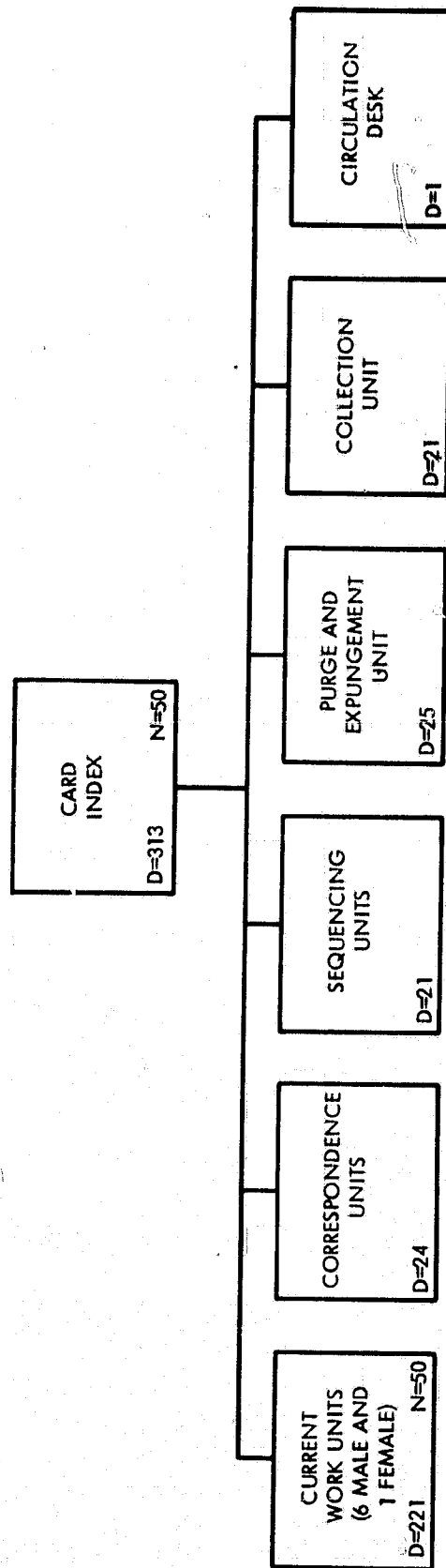
D = DAY   N = NIGHT

Figure 6-5. Card Index Section Direct Labor Force

CARD INDEX
D=313   N=50

CURRENT
WORK UNITS
(6 MALE AND
1 FEMALE)
D=221   N=50

CORRESPONDENCE
UNITS
D=24

SEQUENCING
UNITS
D=21

PURGE AND
EXPUNGEMENT
UNIT
D=25

COLLECTION
UNIT
D=21

CIRCULATION
DESK
D=1

D = DAY   N = NIGHT

Figure 6-6. Automation and Research Section Direct Labor Force
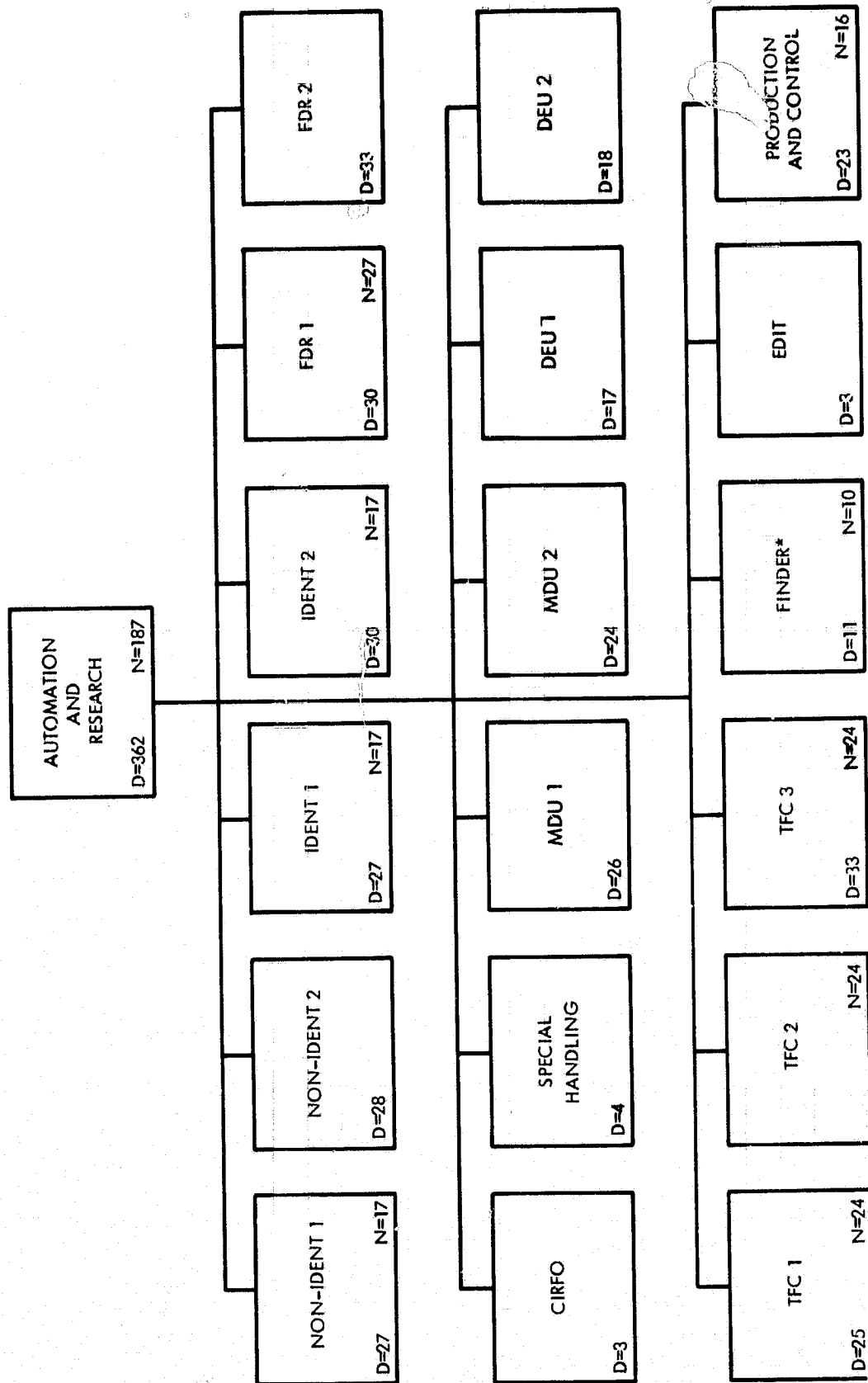
* THE FINDER UNIT ALSO HAS A THIRD SHIFT OF 11 PERSONNEL

D = DAY   N = NIGHT
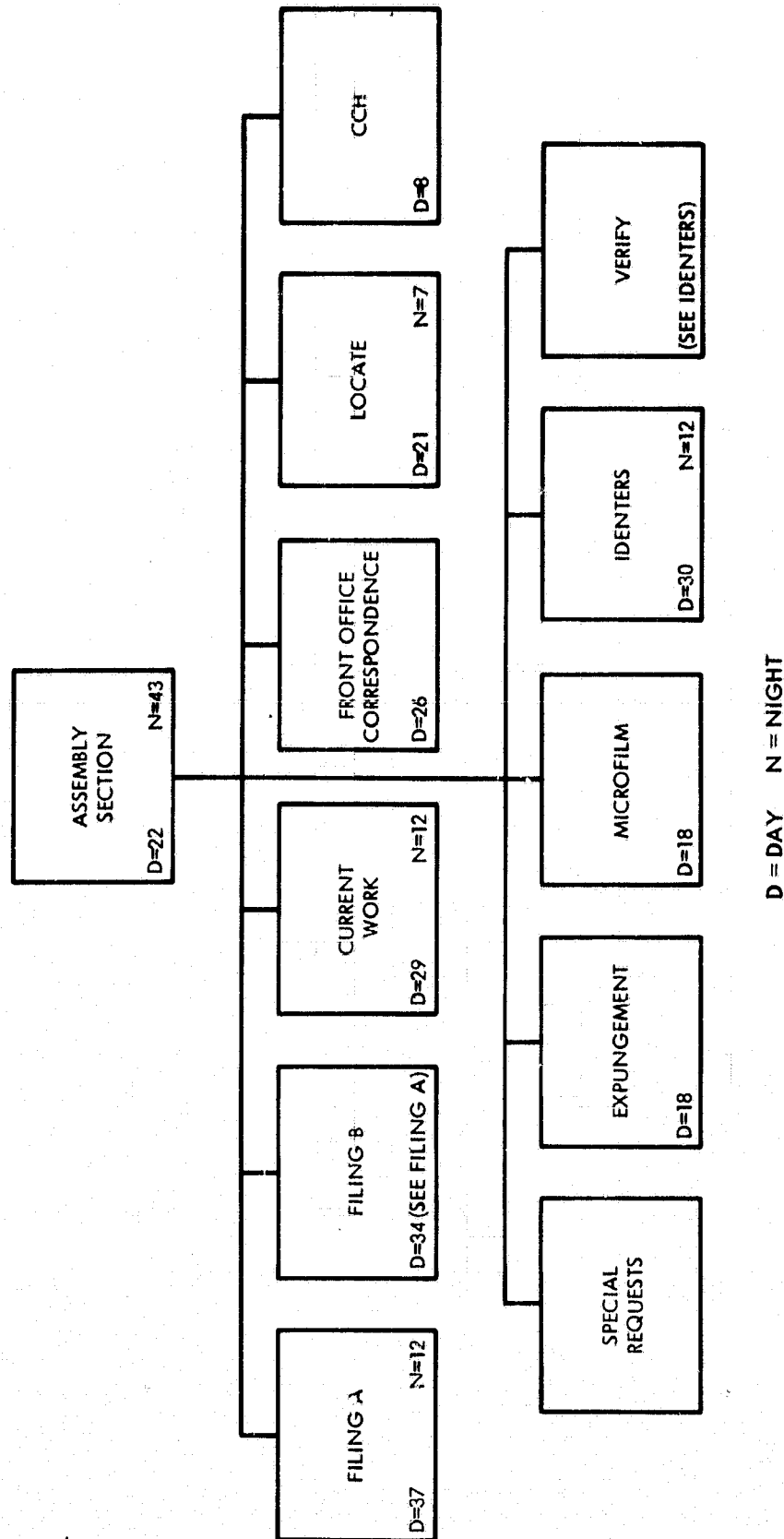
Figure 6-7. Assembly Section Direct Labor Force

4. Production Hours

Statistics for annual leave, sick leave, leave without pay, maternity leave, and other leave taken by support personnel in the Identification Division over a period of six months were used to extrapolate the total number of absence hours during 1979:

Average number of employees: 3,398.83 employees

Total hours of all types of leave: 921,224.49 hours

Average leave in hours/employee/year: $\frac{921,224.49}{3,398.83}$ = 271.04 hours

Average leave hours/employee/day: $\frac{271.04}{250}$ = 1.08 hours

Equivalent number of employees on: $\frac{921,225.59}{250}$ x $\frac{1}{8}$ = 461 employees
leave/day:

In addition, a certain amount of time is lost to socializing, idleness, distraction, and other miscellaneous pursuits which impact production hours. While no measurements of such items were made, figures in the range of 10% to 20% of the work hours should not come as a surprise to anyone.

Thus the net production hours per employee, assuming 10% lost time, is:

$$7.5 \times 0.9 - 1.08 = 5.67 \text{ hours/day}$$

with 20% lost time:

$$7.5 \times 0.8 - 1.08 = 4.92 \text{ hours/day}$$

E. EMPLOYEE TURNOVER

Resignations of Identification Division employees for the calendar year 1978 totaled 1042, representing a 30% turnover rate. In the first nine months of 1979 there were 795 resignations. Projected over a 12-month period the expected total number of resignations is 795 x (12/9) = 1060 representing a 31.5% turnover rate. The reasons for resignations are tabulated below.

Table 6-2. Employee Resignation in Identification Division

	1978	1979 (extrapolated)
Seeking other employment	36.8%	35.9%
Attending school (other area)	15.0	11.6
Poor health (family)	5.1	6.4
Returning to home area	6.9	5.4
Dissatisfaction with assignment	4.4	5.4
Housewife or child care	2.2	4.9
Transportation	3.0	3.9
Marriage	3.8	2.9
Lack of promotional opportunity	0.9	2.5
Attending school (locally)	3.3	2.5

SECTION VII

SIMULATION MODELS OF THE CURRENT SYSTEM

A.   INTRODUCTION

The Current System was modeled using the General Purpose Simulation System (GPSS) on a UNIVAC 1108 Computer.

The purpose of the model is to generate a base case in support of the analysis of the economic feasibility of AIDS III and other alternatives.

Three cases were modeled:

       1.   Current System of November 1979.
       2.   Modified Current System of November 1979.
       3.   Current System projected to 1993.

All cases included the parallel processing functions performed by the manual and the semi-automated (AIDS II) systems.

B.   MODEL DESIGN

The simulation model included all units of the Identification Division involved in processing fingerprints starting from the Recording Unit of Recording Section, bifurcating into two parallel flows; one goes through the manual name search, the fingerprint search, the verification, and the manual response generation, the other flow goes through the semi-automated subject search (AIDS II), the fingerprint search, the verification, and the semi-automated response generation (AIDS II).

Latent Fingerprint and posting sections were excluded from the model as they are not part of the mainstream flow of fingerprint processing.

The Current System is represented by a flow diagram (Figure 7-1) of processing stages linked together in a manner similar to the actual sequence of events between operating units of the Identification Division.

The model has one entry point (Recording Unit) and two exit points: (1) Response generation of Fingerprint Correspondence Section, and (2) Production and Control Subunit of Automation and Research Section. Blocks shown in Figure 7-1 representing operational unit(s) of the Identification Division are considered service facilities in the model. Each facility contains a number of servers that are available for service at all times. The term server means an employee whose function is to process certain aspects of a fingerprint such as name or fingerprint search. Support employees that are performing peripheral functions such as filing, locating a document, or other type of searches are not considered servers.

7-1

N

MAIL INPUT
24,500

1 RECORD

56.8%

2 BLOCK OUT

3 NAME SEARCH

FROM CURRENT WORK

FROM TECH. SORTER

RETURNED PRINTS 3.0%

ALIEN AND PERS. ID. 4.2%

ILLEGIBLES

11.8%

6.2%

NON-
WITH
MILITARY AND
COAST GUARD

24.6%

12 PROD. AND CONT.

13 RECORD TAG

14 BLOCK OUT

15 SS TYPING

AIDS II

11.4%

29.6%

WITH FBI No.

FOLDOUT FRAME

ILLEGIBLES

ILLEGIBLES

ILLEGIBLES

FROM CURRENT WORK

ALIEN AND PERS. ID.

|5| LEGIBILITY

9.9%

4.0%

|4|

TO NAME SEARCH

TECH SORTER

3.9%

11.8%

NON-IDENTS AND IDENTS WITH MASTER ONLY 67.5%

54.7%

20.0%

MILITARY AND COAST GUARD

OUT OF SYSTEM

CRIMINAL NON

14.5%

11.0%

IDENTS

|6| 1

|6| 2

|6| 3

NON-IDENT AND IDENT WITH MASTER ONLY

AUTOMATED POSITIVE IDENTS AND NON-IDEN

FP SEARCH UNITS

|6| 23

62.4%

|15| SS TYPING

|16| SS CHECKING

MILITARY & COAST GUARD

OUT OF SYSTEM

CK UT

|9| VERIFY

4.0%

|8| IDENTIFY

29.6%

TENTATIVE IDENTS

|7|

CURRENT WORK

FOLDOUT FRAME 2

Figure 7-1. Current System Model (1979 Case
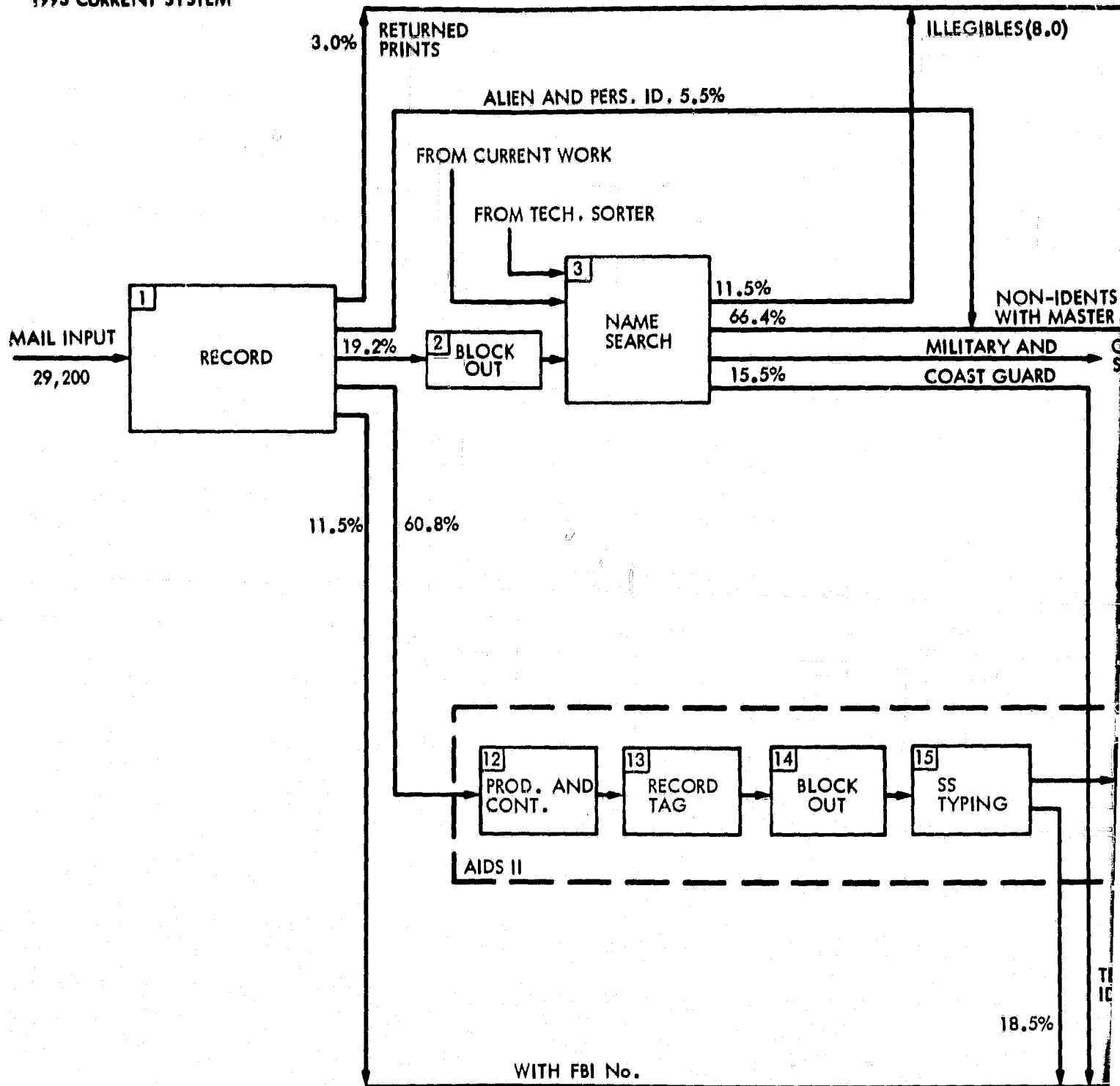
Figure 7-2. Current System Model (1993 Case)

FOLDOUT FRAME

ILLEGIBLES(8.0)   ILLEGIBLES   ILLEGIBLES

FROM CURRENT WORK

5 LEGIBILITY

ALIEN AND PERS. ID.

10.1%

TO NAME SEARCH

4

TECH SORTER

1.0%

52.1%   APPLIC

NON-IDENTS AND IDENTS WITH MASTER ONLY

25.8%

MILITARY AND COAST GUARD

OUT OF SYSTEM 6.2%

CRIMINAL NON-IDENTS

IDENTS 11.0%

6 1

6 2

6 3

6 23

FP SEARCH UNITS

8.0%

NON-IDENT AND IDENT WITH MASTER ONLY 62.0%

AUTOMATED POSITIVE IDENTS AND NON-IDENTS

15 SS TYPING

16 SS CHECKING

MILITARY & COAST GUARD OUT OF SYSTEM 11.5%

9 VERIFY

8 IDENTIFY

7

CURRENT WORK

TENTATIVE IDENTS

18.5%

29.7%

44.7%

12.6%

FOLDOUT FRAME 2

LIEN AND PERS. ID. → OUT OF SYSTEM

TO
NAME SEARCH

1.0%

52.1%   APPLICANT NON-IDENTS → [10] INCOMING WORK → [11] RESPONSE GENERATION

25.8%
CRIMINAL NON-IDENTS

MAIL 1

MAIL 2

TO CONTRIBUT

[12] PROD. AND CONT.

AUTOMATED
POSITIVE IDENTS
AND NON-IDENTS

56.0%
[17] IDENT

MANUAL POSITIVE
IDENTS AND NON-IDENTS

44.0%
[18] NON-IDENT

AIDS II

VERIFY

IDENTIFY

LEGEND:

— — — AIDS II

CURRENT WORK

29.7%

44.7%

12.6%

13.0%

TO
NAME
SEARCH

TO
TECH
SORTER

3

Among the three cases modeled, the first two (Current System of November 1979 and the Modified Current System of 1979) are identical in all aspects except in the number of servers. The third modeled case (Current System projected to 1993) is represented by Figure 7-2 and differs from Figure 7-1 of the first two cases in input volume and splits.

C. ASSUMPTIONS

The following assumptions were made during model design:

(1) All service times approximate exponential distribution (see Section 5D Page 5-6).

(2) Queueing discipline for all stations is based on first-come first-served (FCFS).

(3) All facility servers are available at all times.

(4) All servers of the same facility have equal mean service times.

(5) Queue sizes between facilities are not constrained i.e., queues can grow unrestricted.

(6) All facilities are considered to have single-line multiservers configuration, with the exception of fingerprint searching units. In that case, all channels are considered equally loaded.

(7) Feedback from Response Generation block (See Figures 7-1 and 7-2) is not allowed.

(8) All AIDS II functions, including procedures of data entry, checking, verification, and updating, are maintained through 1993.

(9) All AIDS II workloads are processed by AIDS II.

(10) Delays in AIDS II update cycle from the time a terminal operator key in "enter" to the time Production and Control Subunit receives printed reports is estimated to be 7.25 hours. This delay is maintained through 1993.

(11) The projected configuration of the host processor (370/155), the mini-computers, the communication controllers and the peripheral devices will be the same as that of May 1980 configuration. Disc drives, magnetic tapes, and terminals are allowed to increase.

D.   SIMPLIFICATION

The large number of transactions processed or waiting to be processed in the Identification Division, the variation of the number of servers between day and night shifts, and the variable loading of fingerprint searching channels necessitated the use of logical simplification devices in the model.

1.   Batching

Discrete units of fingerprints are taken in batches of 100 called a transaction. Queues, service times, arrivals, and departures are all treated as transactions of batched fingerprints.

Analytical work on multiserver queueing modles indicated that waiting times and queue sizes are not affected as a result of batching. Moreover, simulation runs with different batch sizes gave similar results.

2.   Switching Workload and Servers

The Current System has two workshifts; day shift and night shift. Some functioning units operate only during day shift, others operate during night shift but at a reduced labor capacity. To allow the number of servers to vary every 7.5 hours, a technique was devised for the model to handle this situation reasonably well. For each work unit, two processing blocks are created; one represents the night shift labor force and the other represents the difference between day and night shift labor forces. Thus, the day force for any unit would be made up of the night labor force plus the complement of the day shift. The night shift and the complement of the day shift were considered two separate facilities.

In order to allow only one single queue to form, the two facilities were framed into one single storage area whose capacity is equal to the day shift labor force (see Figure 7-3). During the night shift the differential facility is turned off, and is turned on after 7.5 hours has elapsed.

This way the model maintains only single waiting line formation during day and night shifts and at the same time allows fluctuations in the number of servers. Distribution of fingerprint transactions to the two facilities is based upon direct proportion of the number of servers in each facility.

3.   Grouping Facilities

The Fingerprint Searching Units in the Identification Division form 23 queueing channels with different loading and service capacity. To allow the model to run successfully on the Univac 1108 the searching units were reconfigured to have 12 equally loaded channels with equal service capacity.
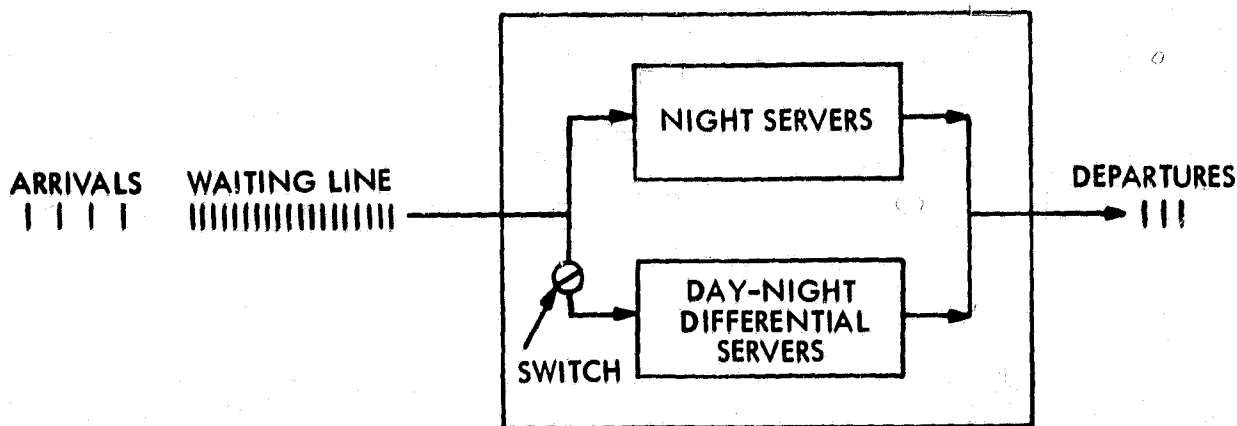
Figure 7-3. Scheme for Switching Servers

E.   MODEL VERIFICATION

The model was tested in several different ways to eliminate programming errors. For example, a limited number of transactions were traced throughout system blocks to make sure they followed the intended paths. Single queue formation ahead of each block with day and night shifts were checked. Throughput volume equal to the input volume for a steady state condition indicated the absence of closed-end loops or premature transaction terminations.

F.   VALIDATION

The derived mean service times utilized in the model are listed in Table 7-1. These service times differ from the mean service times listed in Table 5-1 in that they are generated from the inverse of the fingerprint output rate of various units. The output rates are obtained from extensive measurements taken for all key units of the Identification Division, whereas Table 5-1 values were obtained from direct stopwatch measurements. The derived mean service times were used in the model because they have built-in delays stemming from a number of variables that result in no processing durations (see Section 6-4, Pages 6-11). Data analysis of operating units indicated that the fingerprint output rate approximately follow either Poisson or normal distribution. For the purpose of modeling, service times were chosen to be exponentially distributed.

Input distributions to the model were determined by investigating the Current System input at two points: Mail Room to Recording Unit and Recording Unit to Blocking Out Unit. The results indicated that arrivals are occurring at random and their rate approximates Poisson's distribution.

Table 7-1. Modified Service Times Used in the Models

Facility	Block No. Fig(s) 7-1	Modified Mean Service Times Minutes /FP/ Server
Recording	1	0.67
Blockout	2	0.63
Name Search		
Non-Ident	3	3.0
Ident	3	4.5
Tech. Sorter		
For Search Units	4	0.16
For Sections	4	0.26
Legibility	5	0.11
Fingerprint Search	6	17.1
Current Work	7	0.65
Identification	8	2.21
Verification	9	1.50
FPCS Incoming Work	10	0.25
Response Generation		
Non-Ident	11	1.0
Ident	11	17.0
Production and Control		
PCN	12	0.20
Other	12	1.60
Recording Tagging	13	0.11
Blockout (AIDS II)	14	0.50
Typing (AIDS II)	15	2.00
Checking (AIDS II)	16	2.00
Post Search Ident	17	6.27
Post Search Non-Ident	18	4.95

The percentage splits of fingerprints coming out of each block in Figures 7-1 and 7-2 were obtained from measurements, Identification Division Guidelines, Monthly Work Status Reports, and interviews. The two most significant differences between Figures 7-1 and 7-2 are the daily fingerprint input volume and the percentage splits between the manual name search and AIDS II subject search as a result of projections into the year 1993.

The number of servers by function used in the model is listed in Table 7-2. The difference between the number of servers in the model and the actual number of employees is attributed to all types of leaves, supervision, and miscellaneous support work.

Table 7-2. Models Facility Servers

Facility	Number of Servers			
	1979 Modified Case		1993 Base Case	
	Day	Night	Day	Night
Recording	35	–	51	–
Blocking Out	16	10	6	5
Name Search	85	24	38	13
Tech Sorter	12	10	15	10
Legibility	3	3	3	3
FP Search	340	170	392	196
Current Work	61	6	19	10
Identification	10	3	9	7
Verification	15	6	21	11
FPCS Incoming Work	12	–	7	–
Response Generation	90	–	98	–
Production and Control	21	14	32	25
Post Search Ident	23	26	26	24
Post Search Non-Ident	14	8	23	14
Block Out (AIDS II)	6	–	20	–
Typing (AIDS II)	13	–	41	41
Checking	9	–	33	33

G.   MODEL RESULTS

The base case 1979 Current System model was run for a period equivalent to 40 workdays. The system became saturated with an unprocessed workload and, as a result, queue sizes kept on growing. Thus, a steady state condition of workload processing could not be achieved with longer duration runs.

Two locations within the system appeared to be unstable; (1) The AIDS II Subject Search Unit and (2) The Fingerprint Searching Units.

Analytical work was performed on Fingerprint Search Units performance to explain why fingerprint queue sizes appeared to be stable over a short period of time (less than 3 months).

The simulation model and analytical multiserver algorithms indicate that Fingerprint Search Units have a utilization factor of one (1.) indicating that saturation conditions prevail. However, when 1979 overtime pay (converted to service capacity) was added to the available capacity, the utilization factor dropped marginally to 0.999. This means queue build-ups were impeded temporarily. But, as soon as overtime work stops, queue growth does resume.

The second case is the same as the 1979 Current System model with minor modification. The service capacities (servers) were augmented in order to achieve a steady state condition. However, this modification is not to be mistakenly interpreted as enhancement, for adding more employees alone does not necessarily bring about system improvements.

The 1993 model had a modified service capacity designed to obtain a utilization factor of approximately 0.95.

The simulation models produced response times of complete fingerprint processing composed of times waiting in queues plus the times of service at different work stations. Transportation times, batching times, and holding times were not included in the model but were added to the results of the simultation runs later on. Table 7-2 and 7-3 list the results of the modified 1979 and the projected 1993 Current System models.

Models results indicate that the response times of the modified Current System is considerably less than the present Current System response times, suggesting that the large queue sizes are the major contributors to the delay.

The longer response time of fingerprints through AIDS II is mainly a result of long update cycle of computer files (approximately 7.25 hours).

Thus:

Total RT = Model RT + Transportation Times + Holding Times +   (7-1)
          Batching Delays

Where RT stands for response time and the sum of the last
three terms in equation 7-1 is approximately equal to
989 minutes

Table 7-3. Modified Current System Response Times

| | Manual System | | AIDS II | |
	Model RT	Total RT	Model RT	Total RT
Mean	36.0 min	17 hr 5 min	40.5 min	24 hr 24 min
Median	30.5 min	16 hr 59 min	33.0 min	24 hr 2 min
95%	77.0 min	17 hr 46 min	81.0 min	25 hr 5 min
99%	103.5 min	18 hr 12 min	112.5 min	25 hr 36 min
99.9%	130.0 min	18 hr 39 min	140.5 min	26 hr 4 min

Table 7-4. 1993 Current System Response Times

| | Manual System | | AIDS II | |
	Model RT	Total RT	Model RT	Total RT
Mean	31.5 min	17 hr 0 min	31.5 min	24 hr 15 min
Median	27.0 min	16 hr 56 min	27.0 min	24 hr 11 min
95%	72.0 min	17 hr 41 min	72.0 min	24 hr 46 min
99%	99.0 min	18 hr 8 min	99.0 min	25 hr 23 min
99.9%	153.0 min	19 hr 2 min	153.0 min	26 hr 17 min

SECTION VIII

COST DATA

This section presents cost data for the Identification Division's operation under the following items:

   (1)   Labor cost of supporting personnel.

   (2)   Capital cost for AIDS program.

   (3)   Actual budget expenditure for FY 79.

   (4)   Budget for FY 80.

A.   LABOR COST OF SUPPORTING PERSONNEL

The annual labor costs for supporting personnel (Table 8-1) were developed for five distinct functional operations, namely:

   (1)   The manual system.

   (2)   AIDS II.

   (3)   AIDS III Technical (fingerprint) file conversion (TFC).

   (4)   Latent Fingerprint Section.

   (5)   Front Office.

The rationale for this approach was to focus on the differences between the cost incurred for the manual functions that are subject to present automation effort and the parallel functions that are already automated. The Latent Fingerprint Section and the Front Office are not directly affected by the AIDS II effort, therefore their annual labor costs are presented separately. AIDS III TFC is the present ongoing effort to convert the Master Technical File into a machine readable format in anticipation of automating the technical search functions. Completion is expected in November 1980. AIDS II is the semi-automated system where subject search and response generation functions are performed. The manual system includes the Assembly, Card Index, Fingerprint Correspondence, Posting, Recording, and Technical Sections where functions are performed manually.

Table 8-1. Annual Labor Cost (FY 79)

	Manual	AIDS II[a]	AIDS III[a] TFC	Latent FP	Front Office	Total
Number of employees	2,580	392	241	154	32	3,399
Salaries	28,142,025	4,350,443	2,914,308	2,962,163	399,110	38,768,049
Benefits	3,014,011	465,932	312,122	316,711	42,538	4,150,314
Night differential	443,163	84,259	88,116	7,377	8,065	630,980
Overtime	600,374	144,751	- - -	65,898	9,011	820,032
Total	32,199,573	5,045,385	3,314,546	3,351,149	458,724	44,369,377

[a]Technical Services Division support cost is not included.

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B. CAPITAL COST FOR AIDS II

Capital equipment cost for AIDS II as described in contract J-FBI-7641 is:

Description	Quantity	Unit Price $	Total $
CPU plus memory module	10	25,191	251,910
Video support module	20	1,080	21,600
Keyboard interface	10	300	3,000
Video display	130	1,112	144,560
Keyboard	130	342	44,460
Printer	10	13,560	135,600
Disk drive and controller (8230)	10	6,174	61,740
Disk drive (8231)	10	4,641	46,410
Communication controller (8236)	10	1,056	10,560
Cabling (meters)	4,573	1,312	6,000
CPU installation	10	1,000	1,000
Video display installation	130	32	4,160
		Total	731,000

With the exception of the video displays and keyboards, the equipment allocation between AIDS II and AIDS III TFC is based on a ratio of 4 to 1. The total cost, less video displays and keyboards, is:

$$731,000 - (144,560 + 44,460) = \$541,980$$

The allocation for AIDS II (other than video displays and keyboards) is:

$$541,980 \times 4/5 = \$433,584$$

AIDS II is allocated $130 \times 4/5 = 104$ video displays and keyboards. Thus:

$$104 \times (1112 + 342) = \$151,216$$

Therefore, the equipment cost in contract J-FBI-7641 for AIDS II is:

$$433,584 + 151,216 = \$584.800$$

The capital equipment cost under contract J-FBI-7812 is:

Description	Quantity	Unit Price $	Total $
Video support module	16	1,350	21,600
15-inch video display	190	1,107	210,330
Keyboards	190	435	82,650
Small disk drive	18	4,641	83,538
Add-on-mounting cabinet	10	1,107	11,070
Increased processing capability	10	5,529	55,290
Additional memory	10	6,900	69,000
Keyboard changes	265	342	90,630
Cabling	---	---	6,000
Large disk drive	1	20,592	20,592
Large disk drive	1	33,634	33,634
Communication controller	10	2,964	29,640
Character printer	1	5,925	5,925
		Total	719,899

The allocation for the AIDS III technical file conversion in contract J-FBI-7812 is:

Description	Quantity	Unit Price $	Total $
15-inch video display	8	1,107	8,856
Keyboard	8	435	3,480
Small disk drive	4	4,641	18,564
Add-on-mounting cabinet	2	1,107	2,214
Increased processing capability	2	5,529	11,058
Additional memory	2	6,900	13,800
Keyboard changes	34	342	11,628
Cabling	--	2,964	5,928
		Total	76,166

The AIDS II allocation in contract J-FBI-7812 is:

710,899 - 76,166 = $643,733

Therefore, the AIDS II capital equipment cost derived from contracts J-FBI-7641 and J-FBI-7812 is:

584,800 + 643,733 = $1,228,533

The AIDS II cost for leased magnetic tape drives is:

4940 per month x 4/5 x 12 = $47,424/year

And the AIDS II equipment maintenance cost is:

9573 x 4/5 x 12 = $91,900/year

C.   ACTUAL EXPENDITURES FOR FY 79 AND BUDGET FOR FY 80

Actual expenditures by the Identification Division for FY 79 were:

Personnel	44,373,003
Transportation	187,355
Rent, communication, and utilities	6,608,855
Printing and reproduction	343,697
R&D and equipment maintenance	3,513,140
Supplies and materials	343,542
Capital equipment	130,086
Non-capital equipment (cars, desks, chairs, etc.)	257,046
Total	55,756,724

The Identification Division's budget for FY 80 is:

Personnel	47,962,000
Transportation	200,000
Rent, communication, and utilities	5,342,000
Printing and reproduction	600,000
R&D and equipment maintenance	3,414,000
Supplies and materials	214,000
Non-capital equipment	466,000
Total	58,198,000

SECTION IX

ANOMALIES OF THE MANUAL SYSTEM

The following comments are relative to the manual system. They are based on data derived from measurements, interviews, questionnaires, observations, and documents. Comments related to AIDS II will be under a separate cover.

A. **SYMPTOMS**

    (1)   Long response time to completely process fingerprint cards ranging from 14 to 175 calendar days for non-expedite requests. Measurements indicated that complete fingerprint card processing takes approximately 30 minutes.

    (2)   Enormous queue length (approximately 175,000) of fingerprint cards waiting to be processed in the Technical Section.

    (3)   High rate of very valuable space required for record storage in the Assembly Section.

    (4)   Labor cost of $32,200,000 in FY 79.

    (5)   Difficulty in tracking transactions throughout the Identification Division.

    (6)   Lack of effective management information system relative to operation, personnel, and files.

    (7)   High turnover rate of employees (31% in FY 79).

B. **DIAGNOSIS**

    (1)   The output of the system front end (the recording unit of the Recording Section) is not effectively calibrated to smooth the surges and drops in mail deliveries. For example, the volume output of the Recording Unit varies between 14,500 and 27,000 fingerprint cards from day to day. Most of the output (87%) goes to the Blocking Out Unit. While the Blocking Out Unit can handle a certain amount of volume fluctuation, its labor capacity, which fluctuates only 24% over a 12-month period, faces 70% work load fluctuation overnight.

    (2)   Most Identification Division operating units are clustered around section locations and within their boundaries rather than along the flow of document processing paths. As such, documents have to travel a considerable distance between floor levels before being processed. For example, a

non-identified fingerprint card takes the following path: Recording Section (11th floor) to Card Index Section (11th floor) to Technical Section (7th floor) to Assembly Section (10th floor) to Fingerprint Correspondence Section (9th floor). In this way, the card traverses five different organizational bodies and four different floors before a response is generated and released to the contributor.

In addition, the clustering of operating units results in the setting up of chains of serial-parallel-serial processing paths discussed in Section IV-A. This arrangement has substantial weaknesses along its serial links, particularly in the area of reliability and availability of employees.

The various number of Technical Section assignments of employees to the Recording Assembly, A&R, and Fingerprint Correspondence Sections are attempts to loosen the concept of unit clusterization and place resources along the path of work flow.

(3)   Many units receive and process documents in batches randomly varying in size from one to several thousand fingerprint cards. While batching makes sense, if batch size is properly designed, small batches (less than five per server) and large batches (more than 100 per server) seem to cause substantial dislocation in manpower utilization and response time because of the imbalance between required and available capacity.

(4)   Excessive holding times frequently occur before documents are moved from one unit to another. For example, there are approximately 3-6 deliveries during the day shift from the Blocking Out Unit in the Recording Section to the Card Index Section. No matter what the production rate is in the Blocking Out Unit, it will still take 1-2 hours waiting before moving documents to the Card Index Section.

(5)   A sizeable backlog, approximately 175,000, of the fingerprint cards was observed in the Technical Section. The average waiting time in queue could easily be detected by simply reading the date tag on each fingerprint card.

A review of the daily volumes in Appendix A and the hourly volumes in Appendix B of most Technical Section searching units points to a significant difference between input and output of fingerprint cards. This difference accounts for the queue buildup. While a small backlog was reported to exist in the Technical Section for many years in the past, it was only the last 2-3 years that the queue length exploded to its present magnitude.

The 2-3 year time frame happened to coincide with the start-up of the technical file conversion (TFC), in which

more than 100 employees (62% are GS6 and GS7) from the Technical Section were assigned temporarily to TFC (part of the AIDS III effort). While the decision to temporarily reduce the labor capacity of the Technical Search Units may have been directly responsible for the large queue buildup, other factors, mainly procedural, are significant contributors to the backlog. For example, a searcher receives two fingerprint cards, one civil (applicant) and one criminal. When he is finished processing the civil fingerprint card he will start processing the criminal fingerprint card. In the meantime, the processed civil print will stay in his custody until the criminal print search is completed. This may take as long as 25 minutes.

Supervision of personnel has a definite impact on productivity in the Technical Section as well as in other sections.

(6)   Interfaces between various work units operating along the mainstream work flow do not seem to exist.

The extreme variation in the fingerprint card hourly arrival volumes, as indicated by the standard deviaton of arrival rate in Figures 5-1, 5-2, and 5-6, is only one symptom of the lack of interfacing. This problem should be viewed more in terms of the Division's organizational makeup rather than the physical layout of the work stations.

(7)   The current manual system does not keep an audit trail of transactions (with the exception of a few) as documents move from one work station to another. As a result the content, the originating agency, and the location of these documents are unknown. In addition, a large number of records are either misfiled or missing. Thus, the Identification Division is committed to an additional work force that locates needed documents that are dispersed somewhere in the Division. This operation is tedious, slow, and extremely expensive (60 employees).

(8)   The Assembly Section keeps prints (other than the master), wants, flashes, and rap sheets in criminal history records. These are filed in drawer cabinets. In spite of the microfilming effort initiated to conserve cabinet space, the daily load of records storage is running at a rate of one cabinet per day in order to house incoming records.

(9)   The transport system (Telelift) is designed as a general purpose, batched-document mover between various floor levels of the FBI building. Although the Identification Division has its own separate loops, the transport system is designed as a convenience rather than to optimize Division operations. Its configuration fits the

serial-parallel-serial work flow paths mentioned in
Section IV-A.

(10) The Identification Division does not have a management
information system that can assist management in the
decision-making process without a great deal of effort. As
it stands now, information concerning work loads, delays,
queues, personnel, files, budgets, procurements, and
contract tracking are not readily available and it takes a
considerable amount of time to locate and retrieve
information. Automation and streamlining of the manual
system efforts could be impacted adversely in the absence
of a management information system.

(11) During the last two years the average employee turnover
rate has been approximately 31%. Almost 50% of those who
resigned seemingly indicated the low level of FBI salaries
to be the reason. The JPL study team believes that the
high turnover rate may persist for the following reasons:

(a) It is very hard to justify a competitive salary for
most identification functions, which have limited
educational and experience requirements.

(b) The high cost of living in Washington, D.C., makes
other law enforcement identification departments, in
areas where cost of living is lower, more attractive
to trained personnel.

(12) The Identification Division's technical capability in
industrial engineering/operations research is extremely
limited. In systems engineering/computer science the
Division depends mostly on the Technical Services
Division. As such, major modifications to present
operations would be difficult unless the Identification
Division is able to augment its technical base or the
Technical Services Division increases its involvement with
the Identification Division operation.

(13) The Identification Division manual system does not have
response time requirements at the division or section
level. Although there are standards at the unit level for
most functions, they are apparently directed toward
maintaining discipline over employees rather than
expediting flow of document processing.

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SECTION X

AIDS II PERFORMANCE EVALUATION

The plan is to measure work load parameters (arrivals and departures by type) and service time of work stations, systems, and subsystems of functions performed under AIDS II. Also, tests will be conducted to measure quantitatively parameters such as miss rate and false drops. The object of this effort is to determine the level of performance in terms of response time, accuracy, and cost of AIDS II functions. Comparisons of parallel manual system functions with AIDS II functions will be included in the final report.

SECTION XI

CHANGE AND CONFLICT

Most of the Identification Division functions, with the exception
of the Automation and Research Section functions, and to a lesser
extent the Latent Fingerprint Section functions, have been in existence
for more than 50 years. The identification technique (Henry
Classification System and the minutiae count), the record keeping
system (criminal history records and filing cabinets), the procedures,
the methods, and the approaches to performing the Identification
Division functions have changed little over that period of time. Many
of the Division's middle management and senior supervisory personnel
have spent their professional lives in the midst of a daily routine
characterized by a repetitive manual work process, a highly structured
organization, and a disciplined environment. The junior level
employees are trained, supervised, and managed by the senior employees,
who set the tone of what and how functions are to be performed. Most
promotions to supervisory and management levels occur from within the
FBI, particularly within the Identification Division. Thus, the manual
system environment seems to be deeply rooted.

Pressure to change began in the '70s. The change in environment
within the FBI organization that has taken place in the last several
years intensified the effort to change the ways in which the Division
has been performing its functions for half a century in order to make
it compatible with the external world.

The first change came in the form of an automatic fingerprint
reader in 1972, followed by AIDS I in 1973, and then AIDS II in 1979.
Now, new automated alternative system concepts could have sweeping
impact on the Division organization and its employees. Instead of the
familiar terms referring to name search, pulling criminal history
records, filing wants, typing rap sheets, tagging fingerprint cards,
and stamping documents, words referring to automation, such as data
bases, computer networks, optical fibers and mass storage devices will
be the prevailing terminology of the future Identification Division.
But the implications of automation are a discomfort, inconvenience, and
a threat to many employees. The response, as detected by the JPL study
team, is anxiety and resistance to change. The manifestations of these
two phenomena are very subtle and passive. Yet their impact on the
implementation effort of an automated system is extremely significant,
especially in the area of interunit, interdepartment, and intersystem
work flow processing. What makes it more complex is that the present
source of pressure exerting influence for the change (Rockwell
International) lies outside the Identification Division, therefore the
strong sense of belonging to the same group is missing and the
resistance to change is expected to be intense. The JPL study team
believes that psychological issues, such as anxiety and resistance,
should be well addressed before any major effort is undertaken. This
would avoid long and expensive delays in automation implementation.

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APPENDIX A

MEAN DAILY ARRIVAL AND DEPARTURE VOLUMES

This Appendix contains listings of the mean daily volumes of the operating units of the manual system. Under Unit Name and Section, the name of the unit is either spelled out completely or the acronym, as used in the Identification Division, is given. The sections are coded numerically according to the following list:

110 = Assembly Section

130 = Card Index Section

140 = Fingerprint Correspondence Section

160 = Posting Section

170 = Recording Section

180 = Technical Section

190 = Civil Files

A description of how the figures were derived and an explanation of the column headings are given in Section V-B, Daily Volume, of this report.

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
RECORDING-170	OUTPUT	CIVIL	11975	4
		CRIMINAL	10586	4
DAILY MEAN BY TRANSACTION			22561	
	INPUT	CIVIL	10305	1
		CRIMINAL	12445	1
DAILY MEAN BY TRANSACTION			22750	
DAILY MEAN BY UNIT			45311	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
BLOCKING OUT-170	OUTPUT	CIVIL	9627	5
		CRIMINAL	8631	5
DAILY MEAN BY TRANSACTION			18257	
	INPUT	CIVIL	14310	5
		CRIMINAL	9300	5
DAILY MEAN BY TRANSACTION			23610	
DAILY MEAN BY UNIT			41868	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CIVIL LEGIBIL-170	OUTPUT	CIVIL	167	5
		CRIMINAL	2196	5
DAILY MEAN BY TRANSACTION			2363	
	INPUT	CIVIL	381	5
		CRIMINAL	464	5
DAILY MEAN BY TRANSACTION			845	
DAILY MEAN BY UNIT			3208	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CORRESP.&IE-170	OUTPUT	CIVIL	134	5
		CRIMINAL	1579	5
DAILY MEAN BY TRANSACTION			1712	
	INPUT	CIVIL	37	5
		CRIMINAL	3590	5
DAILY MEAN BY TRANSACTION			3627	
DAILY MEAN BY UNIT			5340	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
NAME CHECK-170	OUTPUT	CRIMINAL	1729	5
DAILY MEAN BY TRANSACTION			1729	
	INPUT	CRIMINAL	1754	5
DAILY MEAN BY TRANSACTION			1754	
DAILY MEAN BY UNIT			3483	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
ROUTING-170	OUTPUT	CIVIL	2321	5
		CRIMINAL	3340	5
DAILY MEAN BY TRANSACTION			5661	
	INPUT	CIVIL	4476	5
		CRIMINAL	596	5
DAILY MEAN BY TRANSACTION			5072	
DAILY MEAN BY UNIT			10733	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CURRENT WORK-130	OUTPUT	CIVIL	12757	5
		CRIMINAL	9580	5
DAILY MEAN BY TRANSACTION			22338	
	INPUT	CIVIL	8954	5
		CRIMINAL	10983	5
DAILY MEAN BY TRANSACTION			19937	
DAILY MEAN BY UNIT			42274	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CORRESPONDENCE-130	OUTPUT	ALL TYPE	5556	5
DAILY MEAN BY TRANSACTION			5556	
	INPUT	ALL TYPE	9649	5
DAILY MEAN BY TRANSACTION			9649	
DAILY MEAN BY UNIT			15205	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
SEQUENCING-130	OUTPUT	CIVIL	32	5
		CRIMINAL	1795	5
DAILY MEAN BY TRANSACTION			1827	
	INPUT	CIVIL	6	5
		CRIMINAL	24013	5
DAILY MEAN BY TRANSACTION			24019	
DAILY MEAN BY UNIT			25847	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-01-180	OUTPUT	CIVIL	318	5
		CRIMINAL	404	5
DAILY MEAN BY TRANSACTION			721	
	INPUT	CIVIL	527	5
		CRIMINAL	596	5
DAILY MEAN BY TRANSACTION			1124	
DAILY MEAN BY UNIT			1845	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-02-180	OUTPUT	CIVIL	508	5
		CRIMINAL	595	5
DAILY MEAN BY TRANSACTION			1103	
	INPUT	CIVIL	583	5
		CRIMINAL	514	5
DAILY MEAN BY TRANSACTION			1097	
DAILY MEAN BY UNIT			2200	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-03-180	OUTPUT	CIVIL	444	5
		CRIMINAL	735	5
DAILY MEAN BY TRANSACTION			1178	
	INPUT	CIVIL	650	5
		CRIMINAL	606	5
DAILY MEAN BY TRANSACTION			1257	
DAILY MEAN BY UNIT			2435	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-04-180	OUTPUT	CIVIL	285	5
		CRIMINAL	270	5
DAILY MEAN BY TRANSACTION			556	
	INPUT	CIVIL	516	5
		CRIMINAL	411	5
DAILY MEAN BY TRANSACTION			926	
DAILY MEAN BY UNIT			1482	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-05-180	OUTPUT	CIVIL	280	5
		CRIMINAL	447	5
DAILY MEAN BY TRANSACTION			726	
	INPUT	CIVIL	588	5
		CRIMINAL	593	5
DAILY MEAN BY TRANSACTION			1181	
DAILY MEAN BY UNIT			1908	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-06-1-180	OUTPUT	CIVIL	301	5
		CRIMINAL	387	5
DAILY MEAN BY TRANSACTION			687	
	INPUT	CIVIL	877	5
		CRIMINAL	577	5
DAILY MEAN BY TRANSACTION			1455	
DAILY MEAN BY UNIT			2142	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-07-180	OUTPUT	CIVIL	161	5
		CRIMINAL	275	5
DAILY MEAN BY TRANSACTION			435	
	INPUT	CIVIL	472	5
		CRIMINAL	483	5
DAILY MEAN BY TRANSACTION			955	
DAILY MEAN BY UNIT			1390	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-08-180	OUTPUT	CIVIL	234	5
		CRIMINAL	255	5
DAILY MEAN BY TRANSACTION			490	
	INPUT	CIVIL	303	5
		CRIMINAL	365	5
DAILY MEAN BY TRANSACTION			668	
DAILY MEAN BY UNIT			1158	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-09-180	OUTPUT	CIVIL	371	5
		CRIMINAL	481	5
DAILY MEAN BY TRANSACTION			852	
	INPUT	CIVIL	560	5
		CRIMINAL	420	5
DAILY MEAN BY TRANSACTION			980	
DAILY MEAN BY UNIT			1832	

UNIT NAME AND SECTION NO.	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-10-180	OUTPUT	CIVIL	228	5
		CRIMINAL	289	5
DAILY MEAN BY TRANSACTION			517	
	INPUT	CIVIL	356	5
		CRIMINAL	391	5
DAILY MEAN BY TRANSACTION			747	
DAILY MEAN BY UNIT			1264	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-11-180	OUTPUT	CIVIL	171	5
		CRIMINAL	214	5
DAILY MEAN BY TRANSACTION			385	
	INPUT	CIVIL	379	5
		CRIMINAL	472	5
DAILY MEAN BY TRANSACTION			850	
DAILY MEAN BY UNIT			1235	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-12-180	OUTPUT	CIVIL	172	5
		CRIMINAL	169	5
DAILY MEAN BY TRANSACTION			342	
	INPUT	CIVIL	760	5
		CRIMINAL	357	5
DAILY MEAN BY TRANSACTION			1116	
DAILY MEAN BY UNIT			1458	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-13-180	OUTPUT	CIVIL	303	5
		CRIMINAL	386	5
DAILY MEAN BY TRANSACTION			689	
	INPUT	CIVIL	620	5
		CRIMINAL	391	5
DAILY MEAN BY TRANSACTION			1011	
DAILY MEAN BY UNIT			1701	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-14-180	OUTPUT	CIVIL	252	5
		CRIMINAL	238	5
DAILY MEAN BY TRANSACTION			489	
	INPUT	CIVIL	529	5
		CRIMINAL	570	5
DAILY MEAN BY TRANSACTION			1100	
DAILY MEAN BY UNIT			1589	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-15-180	OUTPUT	CIVIL	292	5
		CRIMINAL	282	5
DAILY MEAN BY TRANSACTION			574	
	INPUT	CIVIL	447	5
		CRIMINAL	394	5
DAILY MEAN BY TRANSACTION			840	
DAILY MEAN BY UNIT			1415	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-16-180	OUTPUT	CIVIL	392	5
		CRIMINAL	455	5
DAILY MEAN BY TRANSACTION			846	
	INPUT	CIVIL	563	5
		CRIMINAL	518	5
DAILY MEAN BY TRANSACTION			1081	
DAILY MEAN BY UNIT			1927	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-17-180	OUTPUT	CIVIL	331	5
		CRIMINAL	473	5
DAILY MEAN BY TRANSACTION			803	
	INPUT	CIVIL	516	5
		CRIMINAL	588	5
DAILY MEAN BY TRANSACTION			1104	
DAILY MEAN BY UNIT			1907	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-18-180	OUTPUT	CIVIL	490	5
		CRIMINAL	352	5
DAILY MEAN BY TRANSACTION			842	
	INPUT	CIVIL	608	5
		CRIMINAL	379	5
DAILY MEAN BY TRANSACTION			987	
DAILY MEAN BY UNIT			1829	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-19-180	OUTPUT	CIVIL	752	5
		CRIMINAL	347	5
DAILY MEAN BY TRANSACTION			1100	
	INPUT	CIVIL	817	5
		CRIMINAL	347	5
DAILY MEAN BY TRANSACTION			1165	
DAILY MEAN BY UNIT			2264	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-20-180	OUTPUT	CIVIL	658	5
		CRIMINAL	356	5
DAILY MEAN BY TRANSACTION			1014	
	INPUT	CIVIL	885	5
		CRIMINAL	364	5
DAILY MEAN BY TRANSACTION			1249	
DAILY MEAN BY UNIT			2263	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-21-180	OUTPUT	CIVIL	561	5
		CRIMINAL	221	5
DAILY MEAN BY TRANSACTION			782	
	INPUT	CIVIL	570	5
		CRIMINAL	426	5
DAILY MEAN BY TRANSACTION			997	
DAILY MEAN BY UNIT			1779	

UNIT NAME AND SECTION NO.	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-22-180	OUTPUT	CIVIL	1224	5
		CRIMINAL	373	5
DAILY MEAN BY TRANSACTION			1597	
	INPUT	CIVIL	1612	5
		CRIMINAL	514	5
DAILY MEAN BY TRANSACTION			2126	
DAILY MEAN BY UNIT			3723	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-6-2-180	OUTPUT	CIVIL	631	5
		CRIMINAL	402	5
DAILY MEAN BY TRANSACTION			1033	
	INPUT	CIVIL	580	5
		CRIMINAL	505	5
DAILY MEAN BY TRANSACTION			1085	
DAILY MEAN BY UNIT			2118	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-SORT-180	OUTPUT	CIVIL	34867	5
		CRIMINAL	25684	5
DAILY MEAN BY TRANSACTION			60551	
	INPUT	CIVIL	37038	5
		CRIMINAL	27050	5
DAILY MEAN BY TRANSACTION			64088	
DAILY MEAN BY UNIT			124639	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-SPECIAL-180	OUTPUT	CIVIL	130	5
		CRIMINAL	53	5
DAILY MEAN BY TRANSACTION			182	
	INPUT	CIVIL	236	5
		CRIMINAL	316	5
DAILY MEAN BY TRANSACTION			551	
DAILY MEAN BY UNIT			734	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-LEGIBILITY-180	OUTPUT	CIVIL	15678	5
		CRIMINAL	8847	5
DAILY MEAN BY TRANSACTION			24525	
	INPUT	CIVIL	14156	5
		CRIMINAL	7440	5
DAILY MEAN BY TRANSACTION			21596	
DAILY MEAN BY UNIT			46121	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-WANTED RES-180	OUTPUT	CIVIL	46	5
		CRIMINAL	201	5
DAILY MEAN BY TRANSACTION			247	
	INPUT	CIVIL	163	5
		CRIMINAL	140	5
DAILY MEAN BY TRANSACTION			303	
DAILY MEAN BY UNIT			550	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-LOCATE-PURGE-13	OUTPUT	CIVIL	531	5
		CRIMINAL	503	5
DAILY MEAN BY TRANSACTION			1034	
	INPUT	CIVIL	772	5
		CRIMINAL	815	5
DAILY MEAN BY TRANSACTION			1587	
DAILY MEAN BY UNIT			2621	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
IDENT & VERIFY-110	OUTPUT	CIVIL	718	5
		CRIMINAL	7637	5
DAILY MEAN BY TRANSACTION			8356	
	INPUT	CIVIL	366	5
		CRIMINAL	5139	5
DAILY MEAN BY TRANSACTION			5506	
DAILY MEAN BY UNIT			13861	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
FILING-110	OUTPUT	CIVIL	239	5
		CRIMINAL	3032	5
DAILY MEAN BY TRANSACTION			3272	
	INPUT	CIVIL	1509	5
		CRIMINAL	24879	5
DAILY MEAN BY TRANSACTION			26388	
DAILY MEAN BY UNIT			29660	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CURRENT WORK-110	OUTPUT	CIVIL	2787	5
		CRIMINAL	5574	5
DAILY MEAN BY TRANSACTION			8361	
	INPUT	CIVIL	2460	5
		CRIMINAL	4710	5
DAILY MEAN BY TRANSACTION			7170	
DAILY MEAN BY UNIT			15530	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
LOCATE-110	OUTPUT	CIVIL	261	5
		CRIMINAL	785	5
DAILY MEAN BY TRANSACTION			1045	
	INPUT	CIVIL	793	5
		CRIMINAL	556	5
DAILY MEAN BY TRANSACTION			1349	
DAILY MEAN BY UNIT			2394	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
SPECIAL REQUESTS-110	OUTPUT	CIVIL	984	5
		CRIMINAL	0	5
DAILY MEAN BY TRANSACTION			984	
	INPUT	CIVIL	758	5
DAILY MEAN BY TRANSACTION			758	
DAILY MEAN BY UNIT			1742	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
EXPUNGE-110	OUTPUT	CIVIL	230	5
		CRIMINAL	393	5
DAILY MEAN BY TRANSACTION			623	
	INPUT	CIVIL	1629	5
		CRIMINAL	596	5
DAILY MEAN BY TRANSACTION			2224	
DAILY MEAN BY UNIT			2848	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
MICROFILM-110	OUTPUT	CIVIL	515	5
		CRIMINAL	37	5
DAILY MEAN BY TRANSACTION			552	
	INPUT	CIVIL	260	5
		CRIMINAL	211	5
DAILY MEAN BY TRANSACTION			471	
DAILY MEAN BY UNIT			1023	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-EVAL-180	OUTPUT	CIVIL	87	5
		CRIMINAL	190	5
DAILY MEAN BY TRANSACTION			277	
	INPUT	CIVIL	74	5
		CRIMINAL	149	5
DAILY MEAN BY TRANSACTION			223	
DAILY MEAN BY UNIT			499	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECH-BLOCKING OUT-18	OUTPUT	CIVIL	5362	5
		CRIMINAL	2693	5
DAILY MEAN BY TRANSACTION			8055	
DAILY MEAN BY UNIT			8055	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CURRENT PRINT-140	OUTPUT	CIVIL	5086	5
		CRIMINAL	622	5
DAILY MEAN BY TRANSACTION			5708	
	INPUT	CIVIL	5260	5
		CRIMINAL	1082	5
DAILY MEAN BY TRANSACTION			6342	
DAILY MEAN BY UNIT			12050	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CORRESPONDENCE-140	OUTPUT	CIVIL	239	3
		CRIMINAL	433	3
DAILY MEAN BY TRANSACTION			672	
	INPUT	CIVIL	12	3
		CRIMINAL	115	3
DAILY MEAN BY TRANSACTION			127	
DAILY MEAN BY UNIT			799	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
NSO-140	OUTPUT	CIVIL	23	5
		CRIMINAL	184	5
DAILY MEAN BY TRANSACTION			207	
	INPUT	CIVIL	53	5
		CRIMINAL	497	5
DAILY MEAN BY TRANSACTION			550	
DAILY MEAN BY UNIT			757	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
NAFA-140	OUTPUT	CIVIL	4293	5
		CRIMINAL	68	5
DAILY MEAN BY TRANSACTION			4361	
	INPUT	CIVIL	2470	5
		CRIMINAL	473	5
DAILY MEAN BY TRANSACTION			2942	
DAILY MEAN BY UNIT			7304	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CCH-140	OUTPUT	CIVIL	176	5
		CRIMINAL	111	5
DAILY MEAN BY TRANSACTION			287	
	INPUT	CIVIL	14	5
		CRIMINAL	134	5
DAILY MEAN BY TRANSACTION			148	
DAILY MEAN BY UNIT			435	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
MAIL RM ID-140	OUTPUT	ALL TYPE		
			10843	5
DAILY MEAN BY TRANSACTION			10843	
	INPUT	ALL TYPE		
			10480	5
DAILY MEAN BY TRANSACTION			10480	
DAILY MEAN BY UNIT			21323	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
MAIL RM NONID-140	OUTPUT	ALL TYPE		
			14253	3
DAILY MEAN BY TRANSACTION			14253	
	INPUT	ALL TYPE		
			37614	3
DAILY MEAN BY TRANSACTION			37614	
DAILY MEAN BY UNIT			51867	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
MAIL RM THREE-140	OUTPUT	CIVIL		
			27	1
DAILY MEAN BY TRANSACTION			27	
	INPUT	CIVIL		
			300	1
DAILY MEAN BY TRANSACTION			300	
DAILY MEAN BY UNIT			327	

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UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
ALIEN DESK-140	OUTPUT	CIVIL	1731	5
DAILY MEAN BY TRANSACTION			1731	
	INPUT	CIVIL	960	5
DAILY MEAN BY TRANSACTION			960	
DAILY MEAN BY UNIT			2691	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
DISPO DESK-140	OUTPUT	CIVIL	76	5
		CRIMINAL	90	5
DAILY MEAN BY TRANSACTION			166	
	INPUT	CIVIL	2	5
		CRIMINAL	54	5
DAILY MEAN BY TRANSACTION			55	
DAILY MEAN BY UNIT			221	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
RETURN APP-140	OUTPUT	CIVIL	27	1
DAILY MEAN BY TRANSACTION			27	
	INPUT	CIVIL	25	1
DAILY MEAN BY TRANSACTION			25	
DAILY MEAN BY UNIT			52	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
NON-IDENT DESK-140	OUTPUT	CIVIL	1046	4
		CRIMINAL	9	4
DAILY MEAN BY TRANSACTION			1055	
	INPUT	CIVIL	4380	4
		CRIMINAL	174	4
DAILY MEAN BY TRANSACTION			4554	
DAILY MEAN BY UNIT			5609	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CRIMINAL RETURN-140	OUTPUT	CIVIL	33	4
		CRIMINAL	40	4
DAILY MEAN BY TRANSACTION			74	
	INPUT	CIVIL	10	4
		CRIMINAL	71	4
DAILY MEAN BY TRANSACTION			81	
DAILY MEAN BY UNIT			155	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
SCREENING-140	OUTPUT	CIVIL	297	5
		CRIMINAL	1798	5
DAILY MEAN BY TRANSACTION			2095	
	INPUT	CIVIL	136	5
		CRIMINAL	1284	5
DAILY MEAN BY TRANSACTION			1420	
DAILY MEAN BY UNIT			3514	

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UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
INCOMING-160	OUTPUT	CIVIL	4573	5
		CRIMINAL	976	5
DAILY MEAN BY TRANSACTION			5549	
	INPUT	CIVIL	2206	5
		CRIMINAL	975	5
DAILY MEAN BY TRANSACTION			3182	
DAILY MEAN BY UNIT			8731	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
AUTO POSTING-160	OUTPUT	CIVIL	229	5
		CRIMINAL	87	5
DAILY MEAN BY TRANSACTION			316	
	INPUT	CIVIL	345	5
		CRIMINAL	179	5
DAILY MEAN BY TRANSACTION			523	
DAILY MEAN BY UNIT			839	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
UNIT-3-160	OUTPUT	CIVIL	56	4
		CRIMINAL	80	4
DAILY MEAN BY TRANSACTION			136	
	INPUT	CIVIL	112	4
		CRIMINAL	46	4
DAILY MEAN BY TRANSACTION			158	
DAILY MEAN BY UNIT			295	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CLASSROOM-1-160	OUTPUT	CIVIL	253	5
		CRIMINAL	122	5
DAILY MEAN BY TRANSACTION			375	
	INPUT	CIVIL	439	5
		CRIMINAL	158	5
DAILY MEAN BY TRANSACTION			596	
DAILY MEAN BY UNIT			971	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CLASSROOM-2-160	OUTPUT	CIVIL	134	5
		CRIMINAL	19	5
DAILY MEAN BY TRANSACTION			153	
	INPUT	CIVIL	162	5
		CRIMINAL	23	5
DAILY MEAN BY TRANSACTION			186	
DAILY MEAN BY UNIT			339	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CLASSROOM-3-160	OUTPUT	CIVIL	110	5
		CRIMINAL	24	5
DAILY MEAN BY TRANSACTION			134	
	INPUT	CIVIL	62	5
		CRIMINAL	40	5
DAILY MEAN BY TRANSACTION			101	
DAILY MEAN BY UNIT			235	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
CARD INDEX-190	OUTPUT	CIVIL	239	5
		CRIMINAL	37	5
DAILY MEAN BY TRANSACTION			276	
	INPUT	CIVIL	402	5
		CRIMINAL	40	5
DAILY MEAN BY TRANSACTION			442	
DAILY MEAN BY UNIT			718	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
TECHNICAL-190	OUTPUT	CIVIL	36	5
		CRIMINAL	23	5
DAILY MEAN BY TRANSACTION			59	
	INPUT	CIVIL	1419	5
		CRIMINAL	23	5
DAILY MEAN BY TRANSACTION			1442	
DAILY MEAN BY UNIT			1501	

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	MEAN DAILY VOLUME	NUMBER OF DAYS
OLD ARMED FORCES-190	OUTPUT	CRIMINAL	11	5
DAILY MEAN BY TRANSACTION			11	
	INPUT	CIVIL	2	5
		CRIMINAL	9	5
DAILY MEAN BY TRANSACTION			11	
DAILY MEAN BY UNIT			22	

APPENDIX B

MEAN HOURLY ARRIVAL AND DEPARTURE VOLUMES

This Appendix contains listings of the mean hourly arrival and departure volumes of the operating units corresponding to the daily volume in Appendix A.

A description of how the figures were derived and an explanation of the column headings are given in Section V-C.

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
RECORDING-170	OUTPUT	CIVIL	47901	1597	1	2958
		CRIMINAL	42344	1411	1	3118
TOTAL DOCUMENTS BY I/O			90245			
	INPUT	CIVIL	10305	1374	13	2086
		CRIMINAL	12445	1659	14	2363
TOTAL DOCUMENTS BY I/O			22750			
TOTAL DOCUMENTS BY UNIT			112995			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CIVIL LEGIBIL-170	OUTPUT	CIVIL	834	11	1	400
		CRIMINAL	10980	146	1	2135
TOTAL DOCUMENTS BY I/O			11814			
	INPUT	CIVIL	1905	25	430	1475
		CRIMINAL	2322	31	1	485
TOTAL DOCUMENTS BY I/O			4227			
TOTAL DOCUMENTS BY UNIT			16041			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
BLOCKING OUT-170	OUTPUT	CIVIL	48134	1284	95	3127
		CRIMINAL	43153	1151	28	5054
TOTAL DOCUMENTS BY I/O			91287			
	INPUT	CIVIL	71552	1908	1	9408
		CRIMINAL	46500	1240	4	5811
TOTAL DOCUMENTS BY I/O			118052			
TOTAL DOCUMENTS BY UNIT			209339			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CORRESP.&IE-170	OUTPUT	CIVIL	669	18	1	134
		CRIMINAL	7893	210	1	1796
TOTAL DOCUMENTS BY I/O			8562			
	INPUT	CIVIL	187	5	1	41
		CRIMINAL	17949	479	1	10782
TOTAL DOCUMENTS BY I/O			18136			
TOTAL DOCUMENTS BY UNIT			26698			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
NAME CHECK-170	OUTPUT	CRIMINAL	8644	231	2	1166
TOTAL DOCUMENTS BY I/O			8644			
	INPUT	CRIMINAL	8771	234	6	1733
TOTAL DOCUMENTS BY I/O			8771			
TOTAL DOCUMENTS BY UNIT			17415			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
ROUTING-170	OUTPUT	CIVIL	11604	309	1	2506
		CRIMINAL	16700	445	1	1605
TOTAL DOCUMENTS BY I/O			28304			
	INPUT	CIVIL	22381	597	4	3378
		CRIMINAL	2980	79	1	1339
TOTAL DOCUMENTS BY I/O			25361			
TOTAL DOCUMENTS BY UNIT			53665			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CURRENT WORK-130	OUTPUT	CIVIL	63787	850	1	4926
		CRIMINAL	47901	639	6	2498
TOTAL DOCUMENTS BY I/O			111688			
	INPUT	CIVIL	44770	597	1	6411
		CRIMINAL	54913	732	12	5639
TOTAL DOCUMENTS BY I/O			99683			
TOTAL DOCUMENTS BY UNIT			211371			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CORRESPONDENCE-130	OUTPUT	ALL TYPE	27778	741	5	2228
TOTAL DOCUMENTS BY I/O			27778			
	INPUT	ALL TYPE	48247	1287	2	6113
TOTAL DOCUMENTS BY I/O			48247			
TOTAL DOCUMENTS BY UNIT			76025			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
SEQUENCING-130	OUTPUT	CIVIL	162	4	4	87
		CRIMINAL	8975	239	4	1805
TOTAL DOCUMENTS BY I/O			9137			
	INPUT	CIVIL	34	1	31	31
		CRIMINAL	120066	3202	1	51766
TOTAL DOCUMENTS BY I/O			120097			
TOTAL DOCUMENTS BY UNIT			129234			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-01-180	OUTPUT	CIVIL	1588	21	1	82
		CRIMINAL	2019	27	1	225
TOTAL DOCUMENTS BY I/O			3607			
	INPUT	CIVIL	2637	35	1	219
		CRIMINAL	2982	40	1	281
TOTAL DOCUMENTS BY I/O			5619			
TOTAL DOCUMENTS BY UNIT			9226			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-02-180	OUTPUT	CIVIL	2542	34	1	1037
		CRIMINAL	2973	40	1	1222
TOTAL DOCUMENTS BY I/O			5515			
	INPUT	CIVIL	2917	39	1	310
		CRIMINAL	2569	34	1	239
TOTAL DOCUMENTS BY I/O			5486			
TOTAL DOCUMENTS BY UNIT			11001			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-03-180	OUTPUT	CIVIL	2219	30	1	275
		CRIMINAL	3673	49	1	1234
TOTAL DOCUMENTS BY I/O			5892			
	INPUT	CIVIL	3252	43	1	375
		CRIMINAL	3031	40	1	233
TOTAL DOCUMENTS BY I/O			6283			
TOTAL DOCUMENTS BY UNIT			12175			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-04-180	OUTPUT	CIVIL	1426	19	1	73
		CRIMINAL	1352	13	1	107
TOTAL DOCUMENTS BY I/O			2778			
	INPUT	CIVIL	2578	34	1	365
		CRIMINAL	2053	27	1	155
TOTAL DOCUMENTS BY I/O			4631			
TOTAL DOCUMENTS BY UNIT			7409			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-05-180	OUTPUT	CIVIL	1398	19	4	91
		CRIMINAL	2233	30	1	141
TOTAL DOCUMENTS BY I/O			3631			
	INPUT	CIVIL	2942	39	1	742
		CRIMINAL	2965	40	1	207
TOTAL DOCUMENTS BY I/O			5907			
TOTAL DOCUMENTS BY UNIT			9538			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-06-1-180	OUTPUT	CIVIL	1503	20	1	108
		CRIMINAL	1933	26	2	244
TOTAL DOCUMENTS BY I/O			3436			
	INPUT	CIVIL	4386	58	1	940
		CRIMINAL	2887	38	3	328
TOTAL DOCUMENTS BY I/O			7273			
TOTAL DOCUMENTS BY UNIT			10709			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-07-180	OUTPUT	CIVIL	804	11	1	75
		CRIMINAL	1373	18	1	125
TOTAL DOCUMENTS BY I/O			2177			
	INPUT	CIVIL	2358	31	1	223
		CRIMINAL	2417	32	4	244
TOTAL DOCUMENTS BY I/O			4775			
TOTAL DOCUMENTS BY UNIT			6952			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-08-180	OUTPUT	CIVIL	1172	16	1	89
		CRIMINAL	1277	17	4	97
TOTAL DOCUMENTS BY I/O			2449			
	INPUT	CIVIL	1513	20	1	176
		CRIMINAL	1826	24	1	201
TOYAL DOCUMENTS BY I/O			3339			
TOTAL DOCUMENTS BY UNIT			5788			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-09-180	OUTPUT	CIVIL	1857	25	3	158
		CRIMINAL	2403	32	1	155
TOTAL DOCUMENTS BY I/O			4260			
	INPUT	CIVIL	2799	37	2	545
		CRIMINAL	2100	28	5	185
TOTAL DOCUMENTS BY I/O			4899			
TOTAL DOCUMENTS BY UNIT			9159			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-10-180	OUTPUT	CIVIL	1139	15	2	53
		CRIMINAL	1445	19	1	117
TOTAL DOCUMENTS BY I/O			2584			
	INPUT	CIVIL	1782	24	1	200
		CRIMINAL	1953	26	5	200
TOTAL DOCUMENTS BY I/O			3735			
TOTAL DOCUMENTS BY UNIT			6319			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-11-180	OUTPUT	CIVIL	854	11	1	93
		CRIMINAL	1070	14	3	86
TOTAL DOCUMENTS BY I/O			1924			
	INPUT	CIVIL	1894	25	3	233
		CRIMINAL	2358	31	1	183
TOTAL DOCUMENTS BY I/O			4252			
TOTAL DOCUMENTS BY UNIT			6176			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-12-180	OUTPUT	CIVIL	862	11	1	133
		CRIMINAL	847	11	2	91
TOTAL DOCUMENTS BY I/O			1709			
	INPUT	CIVIL	3799	51	1	892
		CRIMINAL	1783	24	1	166
TOTAL DOCUMENTS BY I/O			5582			
TOTAL DOCUMENTS BY UNIT			7291			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-13-180	OUTPUT	CIVIL	1516	20	2	79
		CRIMINAL	1930	26	1	225
TOTAL DOCUMENTS BY I/O			3446			
	INPUT	CIVIL	5102	41	2	1275
		CRIMINAL	1955	26	2	182
TOTAL DOCUMENTS BY I/O			5057			
TOTAL DOCUMENTS BY UNIT			8503			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-14-180	OUTPUT	CIVIL	1258	17	1	119
		CRIMINAL	1188	16	1	92
TOTAL DOCUMENTS BY I/O			2446			
	INPUT	CIVIL	2647	35	1	329
		CRIMINAL	2851	38	2	411
TOTAL DOCUMENTS BY I/O			5498			
TOTAL DOCUMENTS BY UNIT			7944			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-15-180	OUTPUT	CIVIL	1461	19	1	225
		CRIMINAL	1411	19	1	197
TOTAL DOCUMENTS BY I/O			2872			
	INPUT	CIVIL	2234	30	1	476
		CRIMINAL	1968	26	1	173
TOTAL DOCUMENTS BY I/O			4202			
TOTAL DOCUMENTS BY UNIT			7074			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-16-180	OUTPUT	CIVIL	1958	26	1	112
		CRIMINAL	2274	30	1	182
TOTAL DOCUMENTS BY I/O			4232			
	INPUT	CIVIL	2814	38	2	350
		CRIMINAL	2589	35	1	242
TOTAL DOCUMENTS BY I/O			5403			
TOTAL DOCUMENTS BY UNIT			9635			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-17-180	OUTPUT	CIVIL	1654	22	3	114
		CRIMINAL	2363	32	1	263
TOTAL DOCUMENTS BY I/O			4017			
	INPUT	CIVIL	2581	34	1	309
		CRIMINAL	2939	39	1	340
TOTAL DOCUMENTS BY I/O			5520			
TOTAL DOCUMENTS BY UNIT			9537			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-18-180	OUTPUT	CIVIL	2450	33	1	118
		CRIMINAL	1762	23	2	127
TOTAL DOCUMENTS BY I/O			4212			
	INPUT	CIVIL	3038	41	1	308
		CRIMINAL	1896	25	4	243
TOTAL DOCUMENTS BY I/O			4934			
TOTAL DOCUMENTS BY UNIT			9146			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-19-180	OUTPUT	CIVIL	3761	50	1	289
		CRIMINAL	1737	23	1	142
TOTAL DOCUMENTS BY I/O			5498			
	INPUT	CIVIL	4086	54	1	415
		CRIMINAL	1737	23	2	275
TOTAL DOCUMENTS BY I/O			5823			
TOTAL DOCUMENTS BY UNIT			11321			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-20-180	OUTPUT	CIVIL	3289	44	4	219
		CRIMINAL	1779	24	1	121
TOTAL DOCUMENTS BY I/O			5068			
	INPUT	CIVIL	4425	59	1	437
		CRIMINAL	1821	24	1	221
TOTAL DOCUMENTS BY I/O			6246			
TOTAL DOCUMENTS BY UNIT			11314			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-21-180	OUTPUT	CIVIL	2807	37	4	235
		CRIMINAL	1105	15	1	129
TOTAL DOCUMENTS BY I/O			3912			
	INPUT	CIVIL	2852	38	2	459
		CRIMINAL	2131	28	2	805
TOTAL DOCUMENTS BY I/O			4983			
TOTAL DOCUMENTS BY UNIT			8895			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-22-180	OUTPUT	CIVIL	6118	82	5	1793
		CRIMINAL	1866	25	3	88
TOTAL DOCUMENTS BY I/O			7984			
	INPUT	CIVIL	8059	107	5	1793
		CRIMINAL	2570	34	6	540
TOTAL DOCUMENTS BY I/O			10629			
TOTAL DOCUMENTS BY UNIT			18613			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-6-2-180	OUTPUT	CIVIL	3155	42	5	175
		CRIMINAL	2012	27	1	152
TOTAL DOCUMENTS BY I/O			5167			
	INPUT	CIVIL	2900	39	1	346
		CRIMINAL	2524	34	1	303
TOTAL DOCUMENTS BY I/O			5424			
TOTAL DOCUMENTS BY UNIT			10591			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-SORT-180	OUTPUT	CIVIL	174336	2324	2	18424
		CRIMINAL	128420	1712	6	11740
TOTAL DOCUMENTS BY I/O			302756			
	INPUT	CIVIL	185189	2469	24	14615
		CRIMINAL	135250	1803	2	13082
TOTAL DOCUMENTS BY I/O			320439			
TOTAL DOCUMENTS BY UNIT			623195			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-SPECIAL-180	OUTPUT	CIVIL	648	9	1	132
		CRIMINAL	264	4	1	70
TOTAL DOCUMENTS BY I/O			912			
	INPUT	CIVIL	1178	16	3	266
		CRIMINAL	1578	21	1	168
TOTAL DOCUMENTS BY I/O			2756			
TOTAL DOCUMENTS BY UNIT			3668			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-LEGIBILITY-180	OUTPUT	CIVIL	78390	1045	4	3948
		CRIMINAL	44234	590	3	2630
TOTAL DOCUMENTS BY I/O			122624			
	INPUT	CIVIL	70782	944	1	7525
		CRIMINAL	37198	496	2	5892
TOTAL DOCUMENTS BY I/O			107980			
TOTAL DOCUMENTS BY UNIT			230604			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-WANTED RES-180	OUTPUT	CIVIL	228	3	1	36
		CRIMINAL	1007	13	1	91
TOTAL DOCUMENTS BY I/O			1235			
	INPUT	CIVIL	815	11	8	176
		CRIMINAL	699	9	1	77
TOTAL DOCUMENTS BY I/O			1514			
TOTAL DOCUMENTS BY UNIT			2749			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-LOCATE-PURGE-18	OUTPUT	CIVIL	2654	35	6	269
		CRIMINAL	2515	34	1	236
TOTAL DOCUMENTS BY I/O			5169			
	INPUT	CIVIL	3862	51	1	929
		CRIMINAL	4074	54	1	456
TOTAL DOCUMENTS BY I/O			7936			
TOTAL DOCUMENTS BY UNIT			13105			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
VERIFY-110	OUTPUT	CIVIL	3592	48	1	792
		CRIMINAL	38186	509	1	3891
TOTAL DOCUMENTS BY I/O			41778			
	INPUT	CIVIL	1831	24	1	381
		CRIMINAL	25697	343	1	2703
TOTAL DOCUMENTS BY I/O			27528			
TOTAL DOCUMENTS BY UNIT			69306			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
FILING-110	OUTPUT	CIVIL	1197	16	2	411
		CRIMINAL	15162	202	24	1150
TOTAL DOCUMENTS BY I/O			16359			
	INPUT	CIVIL	7545	101	1	2003
		CRIMINAL	124396	1659	2	102504
TOTAL DOCUMENTS BY I/O			131941			
TOTAL DOCUMENTS BY UNIT			148300			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CURRENT WORK-110	OUTPUT	CIVIL	13933	186	1	1317
		CRIMINAL	27871	372	5	1805
TOTAL DOCUMENTS BY I/O			41804			
	INPUT	CIVIL	12300	164	1	2144
		CRIMINAL	23548	314	2	2018
TOTAL DOCUMENTS BY I/O			35848			
TOTAL DOCUMENTS BY UNIT			77652			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(5)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
LOCATE-110	OUTPUT	CIVIL	1303	17	1	348
		CRIMINAL	3924	52	2	342
TOTAL DOCUMENTS BY I/O			5227			
	INPUT	CIVIL	3967	53	1	369
		CRIMINAL	2778	37	1	634
TOTAL DOCUMENTS BY I/O			6745			
TOTAL DOCUMENTS BY UNIT			11972			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(5)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
SPECIAL REQUESTS-110	OUTPUT	CIVIL	4920	131	7	736
		CRIMINAL	1	0	1	1
TOTAL DOCUMENTS BY I/O			4921			
	INPUT	CIVIL	3790	101	7	697
TOTAL DOCUMENTS BY I/O			3790			
TOTAL DOCUMENTS BY UNIT			8711			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(5)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
EXPUNGE-110	OUTPUT	CIVIL	1149	31	2	120
		CRIMINAL	1967	52	3	154
TOTAL DOCUMENTS BY I/O			3116			
	INPUT	CIVIL	8143	217	5	3072
		CRIMINAL	2979	79	1	965
TOTAL DOCUMENTS BY I/O			11122			
TOTAL DOCUMENTS BY UNIT			14238			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(5)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
MICROFILM-110	OUTPUT	CIVIL	2574	69	1	509
		CRIMINAL	186	5	1	37
TOTAL DOCUMENTS BY I/O			2760			
	INPUT	CIVIL	1300	35	1	442
		CRIMINAL	1056	28	1	458
TOTAL DOCUMENTS BY I/O			2356			
TOTAL DOCUMENTS BY UNIT			5116			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-EVAL-180	OUTPUT	CIVIL	433	6	1	37
		CRIMINAL	950	13	1	102
TOTAL DOCUMENTS BY I/O			1383			
	INPUT	CIVIL	369	5	1	129
		CRIMINAL	744	10	1	132
TOTAL DOCUMENTS BY I/O			1113			
TOTAL DOCUMENTS BY UNIT			2496			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECH-BLOCKING OUT-18	OUTPUT	CIVIL	26808	357	105	2921
		CRIMINAL	13467	180	14	2430
TOTAL DOCUMENTS BY I/O			40275			
TOTAL DOCUMENTS BY UNIT			40275			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CURRENT PRINT-140	OUTPUT	CIVIL	25429	339	1	6124
		CRIMINAL	3112	41	1	459
TOTAL DOCUMENTS BY I/O			28541			
	INPUT	CIVIL	26300	351	1	3980
		CRIMINAL	5409	72	1	387
TOTAL DOCUMENTS BY I/O			31709			
TOTAL DOCUMENTS BY UNIT			60250			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CORRESPONDENCE-140	OUTPUT	CIVIL	718	32	2	182
		CRIMINAL	1299	58	76	267
TOTAL DOCUMENTS BY I/O			2017			
	INPUT	CIVIL	35	2	2	11
		CRIMINAL	346	15	6	107
TOTAL DOCUMENTS BY I/O			381			
TOTAL DOCUMENTS BY UNIT			2398			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
N5D-140	OUTPUT	CIVIL	117	3	1	33
		CRIMINAL	918	24	1	248
TOTAL DOCUMENTS BY I/O			1035			
	INPUT	CIVIL	266	7	1	40
		CRIMINAL	2483	66	1	438
TOTAL DOCUMENTS BY I/O			2749			
TOTAL DOCUMENTS BY UNIT			3784			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
HAFA-140	OUTPUT	CIVIL	21465	286	1	6335
		CRIMINAL	342	5	1	129
TOTAL DOCUMENTS BY I/O			21807			
	INPUT	CIVIL	12348	165	1	1665
		CRIMINAL	2364	32	1	948
TOTAL DOCUMENTS BY I/O			14712			
TOTAL DOCUMENTS BY UNIT			36519			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CCH-140	OUTPUT	CIVIL	880	12	1	281
		CRIMINAL	556	7	1	149
TOTAL DOCUMENTS BY I/O			1436			
	INPUT	CIVIL	70	1	1	25
		CRIMINAL	670	9	1	97
TOTAL DOCUMENTS BY I/O			740			
TOTAL DOCUMENTS BY UNIT			2176			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
MAIL RM ID-140	OUTPUT	ALL TYPE	54215	1446	1	23329
TOTAL DOCUMENTS BY I/O			54215			
	INPUT	ALL TYPE	52399	1397	14	6548
TOTAL DOCUMENTS BY I/O			52399			
TOTAL DOCUMENTS BY UNIT			106614			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
MAIL RM NONID-140	OUTPUT	ALL TYPE	42759	1900	2	17471
TOTAL DOCUMENTS BY I/O			42759			
	INPUT	ALL TYPE	112842	5015	50	24208
TOTAL DOCUMENTS BY I/O			112842			
TOTAL DOCUMENTS BY UNIT			155601			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
MAIL RM THREE-140	OUTPUT	CIVIL	27	4	5	22
TOTAL DOCUMENTS BY I/O			27			
	INPUT	CIVIL	300	40	3	57
TOTAL DOCUMENTS BY I/O			300			
TOTAL DOCUMENTS BY UNIT			327			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
ALIEN DESK-140	OUTPUT	CIVIL	8654	231	2	2168
TOTAL DOCUMENTS BY I/O			8654			
	INPUT	CIVIL	4801	128	2	741
TOTAL DOCUMENTS BY I/O			4801			
TOTAL DOCUMENTS BY UNIT			13455			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
DISPO DESK-140	OUTPUT	CIVIL	381	10	1	121
		CRIMINAL	448	12	1	43
TOTAL DOCUMENTS BY I/O			829			
	INPUT	CIVIL	9	0	1	2
		CRIMINAL	268	7	1	35
TOTAL DOCUMENTS BY I/O			277			
TOTAL DOCUMENTS BY UNIT			1106			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
RETURN APP-140	OUTPUT	CIVIL	27	4	2	25
TOTAL DOCUMENTS BY I/O			27			
	INPUT	CIVIL	25	3	25	25
TOTAL DOCUMENTS BY I/O			25			
TOTAL DOCUMENTS BY UNIT			52			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
NON-IDENT DESK-140	OUTPUT	CIVIL	4184	139	1	1228
		CRIMINAL	35	1	35	35
TOTAL DOCUMENTS BY I/O			4219			
	INPUT	CIVIL	17519	584	150	1400
		CRIMINAL	698	23	2	200
TOTAL DOCUMENTS BY I/O			18217			
TOTAL DOCUMENTS BY UNIT			22436			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CRIMINAL RETURN-140	OUTPUT	CIVIL	134	4	6	53
		CRIMINAL	162	5	9	50
TOTAL DOCUMENTS BY I/O			296			
	INPUT	CIVIL	41	1	41	41
		CRIMINAL	283	9	13	81
TOTAL DOCUMENTS BY I/O			324			
TOTAL DOCUMENTS BY UNIT			620			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
SCREENING-140	OUTPUT	CIVIL	1486	40	1	141
		CRIMINAL	8988	240	35	484
TOTAL DOCUMENTS BY I/O			10474			
	INPUT	CIVIL	678	18	1	135
		CRIMINAL	6420	171	4	637
TOTAL DOCUMENTS BY I/O			7098			
TOTAL DOCUMENTS BY UNIT			17572			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
INCOMING-160	OUTPUT	CIVIL	22864	610	66	11185
		CRIMINAL	4881	130	4	327
TOTAL DOCUMENTS BY I/O			27745			
	INPUT	CIVIL	11032	294	12	1370
		CRIMINAL	4876	130	6	502
TOTAL DOCUMENTS BY I/O			15908			
TOTAL DOCUMENTS BY UNIT			43653			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
AUTO POSTING-160	OUTPUT	CIVIL	1147	31	1	75
		CRIMINAL	433	12	1	58
TOTAL DOCUMENTS BY I/O			1580			
	INPUT	CIVIL	1723	46	1	494
		CRIMINAL	893	24	1	214
TOTAL DOCUMENTS BY I/O			2616			
TOTAL DOCUMENTS BY UNIT			4196			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
UNIT-3-160	OUTPUT	CIVIL	224	7	1	53
		CRIMINAL	322	11	1	149
TOTAL DOCUMENTS BY I/O			546			
	INPUT	CIVIL	448	15	1	116
		CRIMINAL	185	6	1	40
TOTAL DOCUMENTS BY I/O			633			
TOTAL DOCUMENTS BY UNIT			1179			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CLASSROOM-1-160	OUTPUT	CIVIL	1265	34	1	166
		CRIMINAL	609	16	5	72
TOTAL DOCUMENTS BY I/O			1874			
	INPUT	CIVIL	2193	58	1	215
		CRIMINAL	789	21	1	.87
TOTAL DOCUMENTS BY I/O			2982			
TOTAL DOCUMENTS BY UNIT			4856			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CLASSROOM-2-160	OUTPUT	CIVIL	672	18	6	130
		CRIMINAL	93	2	1	30
TOTAL DOCUMENTS BY I/O			765			
	INPUT	CIVIL	812	22	3	166
		CRIMINAL	117	3	1	38
TOTAL DOCUMENTS BY I/O			929			
TOTAL DOCUMENTS BY UNIT			1694			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CLASSROOM-3-160	OUTPUT	CIVIL	549	15	1	174
		CRIMINAL	121	3	1	34
TOTAL DOCUMENTS BY I/O			670			
	INPUT	CIVIL	308	8	1	91
		CRIMINAL	199	5	1	128
TOTAL DOCUMENTS BY I/O			507			
TOTAL DOCUMENTS BY UNIT			1177			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
CARD INDEX-190	OUTPUT	CIVIL	1196	32	1	406
		CRIMINAL	185	5	6	38
TOTAL DOCUMENTS BY I/O			1381			
	INPUT	CIVIL	2010	54	3	1215
		CRIMINAL	199	5	1	46
TOTAL DOCUMENTS BY I/O			2209			
TOTAL DOCUMENTS BY UNIT			3590			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
TECHNICAL-190	OUTPUT	CIVIL	179	5	1	25
		CRIMINAL	117	3	1	38
TOTAL DOCUMENTS BY I/O			296			
	INPUT	CIVIL	7094	189	1	5309
		CRIMINAL	117	3	1	21
TOTAL DOCUMENTS BY I/O			7211			
TOTAL DOCUMENTS BY UNIT			7507			

UNIT NAME AND SECTION NO	I-O	DOCUMENT TYPE	NUMBER OF DOCUMENTS	MEAN HOURLY VOLUME USING LENGTH OF SHIFT(S)	MIN HOURLY VOLUME	MAX HOURLY VOLUME
OLD ARMED FORCES-190	OUTPUT	CRIMINAL	57	2	2	12
TOTAL DOCUMENTS BY I/O			57			
	INPUT	CIVIL	11	0	11	11
		CRIMINAL	44	1	4	16
TOTAL DOCUMENTS BY I/O			55			
TOTAL DOCUMENTS BY UNIT			112			

APPENDIX C

PERSONNEL AND WORK LOAD STATISTICS

Tables C-1 through C-3 are drawn from statistics compiled by the FBI.

The tables show historical end-of-month personnel count from 1970 through August 1979, work load statistics for FY 70 through FY 78, and work load and file statistics for FY 70 through FY 78.

Table C-1. Historical End of Month Personnel Count From 1970 Through August 1979

MONTH \ YEAR	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1	2,807	3,095	3,094	3,336	3,108	3,064	2,955	3,185	3,230	3,401
2	2,917	3,133	3,104	3,264	3,075	3,035	3,029	3,124	3,294	3,365
3	2,913	3,137	3,139	3,195	3,077	2,982	3,086	3,092	3,325	3,386
4	2,912	3,173	3,208	3,170	3,035	2,965	3,180	3,025	3,301	3,364
5	2,938	3,172	3,181	3,229	2,995	2,973	3,238	3,006	3,344	3,316
6	3,158	3,321	3,380	3,327	3,105	2,972	3,319	3,008	3,467	3,329
7	3,390	3,564	3,402	3,308	3,135	2,993	3,449	2,961	3,440	3,319
8	3,380	3,575	3,427	3,435	3,196	2,956	3,357	3,041	3,476	3,329
9	3,370	3,443	3,375	3,403	3,143	2,909	3,378	3,194	3,564	
10	3,384	3,364	3,347	3,324	3,147	2,923	3,378	3,165	3,554	
11	3,275	3,178	3,408	3,267	3,146	2,932	3,314	3,145	3,557	
12	3,157	3,086	3,317	3,153	3,077	2,900	3,237	3,157	3,480	

Table C-2. Work Load Statistics for FY 70 Through FY 78

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Mean FP Card Arrivals/Day	28,768	26,524	24,025	24,234	22,162	23,005	22,405	24,177	25,407
Criminal	12,774	13,599	13,987	13,065	11,119	11,442	11,402	11,465	11,679
Deceased	90	86	84	81	76	82	73	74	69
Civil	15,904	12,834	9,954	11,088	10,967	11,481	10,930	12,638	13,659
FP Card Arrivals/Year	7,220,816	6,710,518	6,078,212	6,034,310	5,518,387	5,797,145	5,645,938	6,068,303	6,377,152
Criminal	3,206,258	3,446,613	3,538,697	3,253,119	2,768,663	2,883,434	2,873,296	2,877,777	2,931,402
Deceased	22,689	21,756	21,266	20,260	18,991	20,664	18,510	18,670	17,193
Civil	3,991,869	3,248,149	2,518,249	2,760,931	2,730,733	2,895,047	2,754,132	3,171,656	3,428,557
Illegible Returns/Year	673,300	724,521	819,359	933,140	891,095	1,049,931	1,040,782	1,110,655	1,141,144
Criminal	225,336	245,447	299,599	364,823	331,153	415,400	398,915	400,358	391,902
Deceased	2,302	2,533	2,529	2,549	2,478	3,700	3,364	3,521	2,670
Civil	445,662	476,541	517,231	565,768	557,464	630,831	638,503	706,776	746,572
Net FP Cards to be Processed/Year	6,540,119	5,975,764	5,245,857	4,951,485	4,415,997	4,540,129	4,424,932	4,794,766	5,057,081
Criminal	2,980,922	3,195,166	3,239,098	2,879,746	2,437,510	2,468,034	2,474,381	2,477,419	2,529,500
Deceased	20,387	19,223	18,737	17,711	16,513	16,964	15,146	15,149	14,523
Civil	3,538,810	2,761,375	1,988,022	2,054,028	1,961,974	2,055,131	1,935,405	2,302,198	2,503,058
Workdays/Fiscal Year	251	253	253	249	249	252	252	251	251

C-3

Table C-3. Work Load and File Size Statistics for FY 70 Through FY 78

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Name Check Requests	3,803,829	4,389,455	4,529,222	4,640,927	4,732,163	5,146,792	5,379,475	4,163,744	4,974,242
Latent FP Cases	30,339	32,864	34,925	36,123	37,804	41,997	39,282	32,958	26,735
Fugitives Identified	37,646	41,983	40,485	40,642	38,999	32,019	30,329	22,215	18,681
Wanted Notices in File	63,063	86,094	105,100	120,977	122,934	128,713	135,536	156,707	186,660
Number of Contributors	14,957	15,202	15,350	7,710	7,061	7,195	7,535	9,185	9,709
Estimated Persons in Criminal Files	18,351,040	19,616,329	20,298,895	20,665,221	21,183,149	21,060,816	21,562,860	22,096,842	21,872,810
Estimated Persons in Civil Files	66,351,040	67,111,407	56,561,132	39,605,655	39,231,283	39,939,128	40,604,333	41,591,694	42,418,145
No. of Criminal Records Automated	—	—	—	—	—	1,081,081	1,794,900	2,752,362	3,483,743
Total FP Cards In Possession	197,149,252	201,315,031	193,822,138	159,345,941	159,883,003	162,194,928	164,766,200	167,700,416	169,918,912
Criminal	60,935,680	64,108,243	67,299,915	69,699,033	71,589,828	72,906,890	74,527,148	76,072,190	77,133,686
Deceased	7,105,258	7,440,476	6,846,527	6,879,303	6,905,061	6,136,157	6,042,849	5,628,760	5,784,482
Civil	129,108,314	129,766,312	119,675,696	82,767,605	81,388,114	82,151,881	84,196,203	85,999,466	87,030,744
Index Cards In Possession	173,746,015	177,235,141	168,936,180	161,486,882	166,144,249	159,142,175	171,618,409	172,415,838	173,665,472
Prints Recorded on Microfilm	29,425,102	31,169,637	33,600,926	35,702,604	38,035,020	40,639,383	42,105,761	42,358,257	43,151,430
Workdays/Fiscal Year	251	253	253	249	249	252	252	241	251

APPENDIX D

GOODNESS-OF-FIT TEST

Table D-1 is a sample (Figure 5-5) of the Kolmogoror-Smirnov tests conducted on the Identification Division arrivals and departures of fingerprints.

Table D-1. Kolmogorov-Smirnov Test

Data Range	Observed Frequency (a)	Probability (b)	Theoretical Probability (c)	Cumulative Probability (d)	Cumulative Theoretical Probability (e)	Absolute Difference (d-e)
0-500	12	0.29	0.19	0.29	0.19	0.10
500-1000	7	0.17	0.25	0.46	0.44	0.02
1000-1500	6	0.14	0.24	0.60	0.68	0.08
1500-2000	7	0.17	0.16	0.77	0.84	0.07
2000-2500	5	0.12	0.09	0.89	0.93	0.04
2500-3000	1	0.02	0.04	0.91	0.97	0.06
3000-3500	3	0.07	0.02	0.98	0.99	0.01
3500-4000	1	0.02	0.01	1.00	1.00	0.00

From the table of quantiles of the K-S test statistic, page 397, reference 16 the critical value at 5% significance level is $\frac{136}{\sqrt{N}}$. The maximum difference is 0.1.

$\frac{136}{\sqrt{42}} = 0.209 > 0.1$ Therefore the null hypothesis is accepted.

D-2

APPENDIX E

ACRONYMS

ACS	Automated Classification System
AFRS	Automated Fingerprint Reader System
AHU	Anti-Halation Underlayer
AIDS	Automated Identification Division System
ANS	Automated Name Search
ATS	Automated Technical Search
ATSPS	Automated Technical Search Pilot System
AUTOCOR	Automated Correspondence Station (part of AIDS)
AUTORESP	Automated Response Generation (part of AIDS)
A&R	Automation and Research Section of Identification Division
BER	Bit Error Rates
BLO	Blocking Out
CCA	Computerized Contributor Abbreviated Name
CCH	Computerized Criminal History (part of NCIC)
CCN	Computerized Criminal Name
CCNR	Computerized Criminal Name and Record (part of AIDS)
CCR	Computerized Criminal (Arrest) Record (part of AIDS)
CIR	Computerized Ident Response File (part of AIDS)
CLASS-A	Classification-A
CLASS-B	Classification-B
CLASS-C	Classification-C
CLCK	Classification Check
CNR	Computerized Non-Ident Response File
COA	Cutoff Age
CPU	Central Processing Unit

CRS	Computerized Record Sent File (part of AIDS)
CRT	Cathode Ray Tube
CSORT	Centerline Sort
DATE STP	Date Stamp, Count and Log
DBMS	Data Base Management System
DEDS	Data Entry and Display Subsystem (part of AIDS III)
DENT	Data Entry
DENT-A	Data Entry-Cards
DENT-B	Data Entry-Documents
DOA	Date of Arrest (on f/p card)
DOB	Date of Birth (on f/p card)
ECL	Emitter Coupled Logic
EMI	Electromagnetic Interference
ENC	Encode Input Data-Cards
ENCDOC	Encode Input Data-Documents
ENCK	Encode Check-Cards
ENDOCK	Encode Check-Documents
ERR	Update Error File
EYE	Color of Eyes (on f/p card)
FBI	Federal Bureau of Investigation
FEP	Front End Processor
FIFO	First-In-First-Out
FLAB	Film Lab Processing/Computer
FLOAD	Film Load
FPC	Fingerprint Classification
FPCS	Fingerprint Correspondence Section of the Identification Division
f/p	Fingerprint

GDBMS	General Purpose Data Base Management System
GEO	Geographic Location (on f/p card)
GPSS	General Purpose Simulation System
HAI	Color of Hair (on f/p card)
HGT	Height (on f/p card)
IBM	International Business Machines Corporation
ICI	Image Comparison Identification
ICRQ	Image Comparison Request
ICS	Image Comparison Subsystem (part of AIDS III, actually used for image retrieval for manual comparison)
ICV	Image Comparison Verification
ID, I.D.	Identification Division
IDENT	Identification
JPL	Jet Propulsion Laboratory
KIPS	Thousands of Instructions per Second (as executed by a computer)
LEAA	Law Enforcement Assistance Agency
MAIL	Open Mail and Sort
MFILM	Image Capture Microfilm
MIPS	Millions of Instructions per Second (as executed by a computer)
MMF	Minutiae Master File
MOE	Measures of Effectiveness
MTBF	Mean Time Between Failures
MTR	Master Transaction Record
MTTR	Mean Time to Repair
NAM	Name (on f/p card)
NASA	National Aeronautics and Space Administration
NCIC	National Crime Information Center

NCR	National Cash Register Company
OCA	Local Identification Number (on f/p card)
OCR	Optical Character Recognition
OMB	Office of Management and Budget
ORI	Originating Agency Identification Number (on f/p card)
PCN	Process Control Number
PICS	PCN and Image Capture Subsystem (part of AIDS III)
PMT	Photomultiplier Tubes
POB	Place of Birth (on f/p card)
QC	Quality Control
QUERY	On-Line Query
RAC	Race (on f/p card)
READ	Quality Control Check, Read, Annotate
RFI	Radio Frequency Interference
RH	Relative Humidity
RVF	Ridge Valley Filter
SACS	Semi-Automatic Classification System
SAR	Semi-Automatic Fingerprint Reader
SEAR	Search Review
SEX	Reported Sex of a Subject (on f/p card)
SID	State Identification Number
SKN	Skin Tone (on f/p card)
SOC	Social Security Number (on f/p card)
SPM	Search Processor Module
SS	System Supervisor Subsystem (part of AIDS III)
SSM	Subject Search Module
SSRG	Subject Search and Response Generation Subsystem (part of AIDS III)

TDFA	Top Down Functional Analysis
TFC	Technical File Conversion
TR	Transaction Record
TRC	Transaction Control File
TSS	Technical Search Subsystem (part of AIDS III)
TTL	Transistor - Transistor Logic
VDENT-A	Verify Data Entry-Cards
VDENT-B	Verify Data Entry-Documents
VLSI	Very Large Scale Integration
WAND	Wand Out of System