

tape converter was installed to eliminate this interim step. A high-speed printer prepares all checks and the central computer updates and maintains the master record. Payroll processing includes wage payments to all of Sylvania's employees, plus the preparation of required statistical data on labor distribution, cost accounting, and other necessary accumulations.

99. FUTURE OPERATIONS

In the future the Sylvania Company looks forward to certain definite results accruing from its data processing system.

a. Daily action reports are received from 17 warehouses for preparation of a weekly total and individual inventory listing. This processing eliminates the delayed accumulation of information. It also greatly facilitates the establishment of divisional requirements and the presentation of a company-wide picture.

b. The data processing center has emerged as the sole facility for complete accounting and statistical services for all operating divisions. The statistical reports now used by the division management are prepared at the data processing center and are available on the 3rd or 4th of the month, as opposed to previous delivery on the 15th. Conversion of one complete division provided experience for later conversions.

100. SUMMARY

The Sylvania program points up many concepts applicable to U. S. Army data processing operations. The geographical distribution of the two organizations is similar, and the need for accurate and up-to-date information is imperative for both. The Sylvania Company data processing center operates on a service-bureau basis; that is, it operates for all divisions, but each division operates independently of every other division. Because the divisions do not warrant separate computer installations, the central unit operates for all. This basic concept may be applied to the diversified units of the Army.

Section VI. TAGO AUTOMATIC DATA PROCESSING SYSTEM

101. GENERAL

In March 1955, The Adjutant General's Office (TAGO) initiated a comprehensive study in an attempt to determine how Army personnel administration and record keeping could be improved with regard to providing more effective and timely management information. This research, conducted by a seven-man TAGO committee, resulted in the installation of an ADPS consisting of a large scale computer and a supporting transceiver communication network. The immediate aim of this installation was to improve operations accomplished at D/A level rather than inaugurate a far-reaching long-range system that would have a similar effect in field operations. More specifically, the desired objectives were:

a. Timeliness. Management personnel, the users of information and reports compiled at D/A level, stated that distinct advantages would accrue in the form of bases for more sound decisions if the required personnel and strength information could be made available more rapidly than was currently possible.

b. Accuracy. Employment of internal data type checks would insure a high degree of accuracy in the massive volume of data to be processed by the system.

c. Increased Detail. ADPS capabilities would facilitate the gathering and processing of certain types of information heretofore inaccessible or available only at prohibitive costs.

d. Economy of Operations. In addition to the above benefits, it was anticipated that certain economies of operation would result from ADPS installation.

TRANSACTION FLOW
BETWEEN
CONUS MRU'S AND D/A
OVERSEAS MRU'S AND D/A

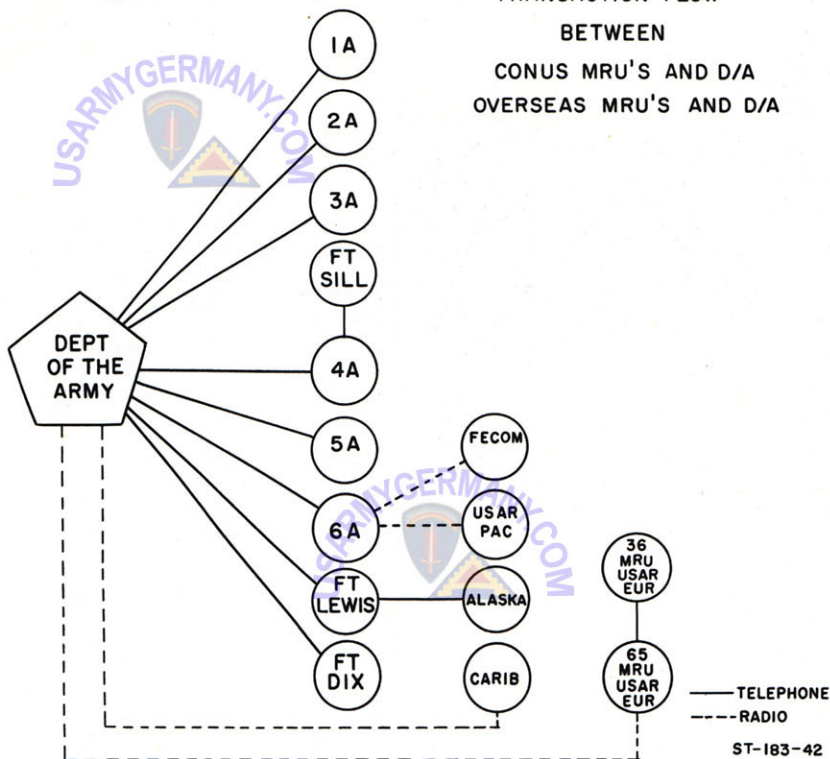
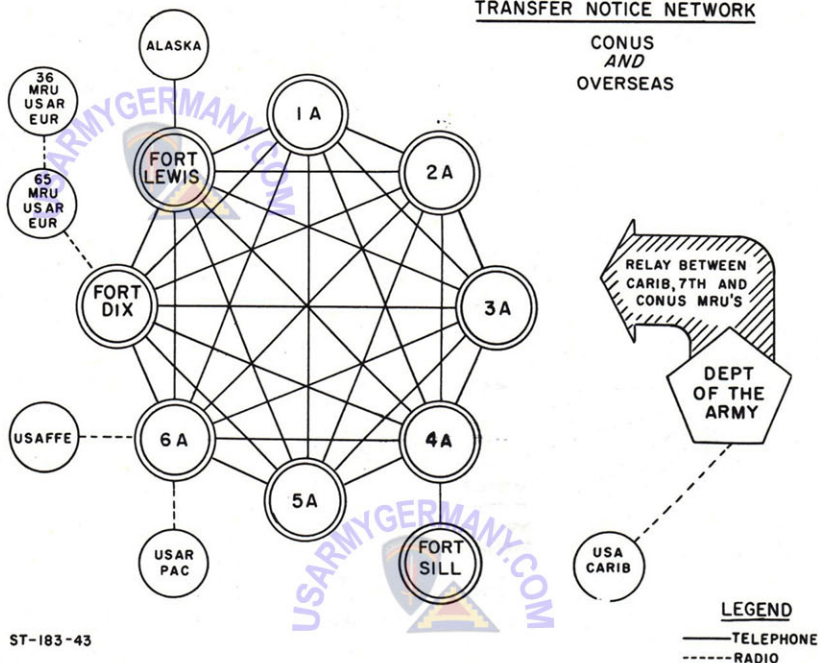


Figure 42. Transaction flow.

102. COMMUNICATION FACILITIES

The TAG ADPS installation is presently supported by a widely dispersed transceiver network. (See figure 42.) These transceivers transmit information to the Department of the Army from CONUS and major oversea command locations. Use of such transmission devices provides rapid and orderly accumulation of data from distant points and facilitates up-to-date record keeping which, in the past, was sometimes as much as four months in arrears of specific action. The transceiver network is also employed in transmitting error messages from the Department of the Army to the field. It further provides an effective communication coordination network between the various field installations in connection with reassignment of personnel (fig. 43). It is anticipated that this network will be employed in the future to carry certain types of information back to the field locations.

TRANSFER NOTICE NETWORKCONUS
AND
OVERSEAS

ST-183-43

Figure 43. Transfer notice network.103. MASTER FILE

The Office of The Adjutant General in Washington, D. C., maintains a master personnel record file of every commissioned and warrant officer, male and female, on active duty with the Army. Each personnel record is recorded on the master file in 395 characters. These sequenced records (approximately 110,000) are maintained in an 11-reel magnetic tape file which is updated and rewritten every workday.

104. THE SYSTEM FLOW

a. Document Origination. Punch cards may be prepared at both Department of the Army level and CONUS army and major oversea command level, depending upon the type of action. The transactions prepared at CONUS army and major oversea commands are forwarded via transceiver to the Washington, D. C., computing center. After a minimum of EAM preparation the daily activity of transaction records (approximately 4,500 cards) are converted to magnetic tape.

b. Input. All transaction input to the system is in the form of magnetic tape, created on off-line card-to-tape conversion equipment. This facilitates more rapid input.

c. Processing.

- (1) Prior to the major daily updating run, the transaction file is sequence-sorted and edited for accuracy of coded data. The transaction file is then run against the master file under the direction of a 2,500-instruction program. If the transaction record represents an addition to the Army, a new master record is placed on tape in its proper sequence. If the transaction signals a retirement, a discharge, or a relief from active duty, the obsolete master record is deleted from the master file. When transactions represent a change in assignment, actual or projected, or a change in personnel status or statistical data, the master record is updated accordingly. There are more than 70 different types of transactions that might affect a master record.
- (2) During the updating cycle, which requires about 1.9 hours per day, many checks between the transaction data and master record data are performed to assure accuracy. For example, the chronology of reassignment actions is checked for processing sequence; a record selected for corrective action is so noted on the master record in order to preclude processing, pending the return of corrected data; and promotions are checked to insure that the progression is to the next higher grade only. Controls in the daily updating are centered around balancing previous and current record counts and "hash" totals. Also included in the program is a check point and restart routine which permits the recall of memory as it was immediately following the last or any previous balanced check point. This is an effective method of recreating a particular sequence without rerunning the entire file in the event of an error or a damaged tape.
- (3) More than 60 programs have been written and tested for the performance of other jobs, such as statistical analyses and various reports and summaries.

d. Output.

- (1) Daily. In addition to the new master record file, the updating program produces a subsidiary tape consisting of accession and separation statistical records, locator records based on new assignments, command strength summary cards, and identified error conditions. This output totals approximately 2,000 records per day which are handled by EAM equipment after a tape-to-card conversion.
- (2) Periodic. About 120 different reports are prepared from the system on a recurring base. These reports are summary tabulations for strength purposes and individual name listings for management and statistical purposes. They include:
 - (a) Summaries of officer strength.
 - (b) Officer inventory and projection reports.
 - (c) Summaries of enlisted strength.
 - (d) Personnel statistical reports by branch, grade, component, etc.
 - (e) Unit strength reports.
 - (f) Officer qualification reports (MOS, education category, etc.).
 - (g) Officer efficiency index reports.
- (3) Special requests. In addition to the above reports, an average of 10 to 15 special request reports are prepared during a normal month. In order to accomplish these special requests with a minimum of programming, a flexible extract program has been developed.



Figure 44. Personnel management by ADPS.

105. EQUIPMENT

The IBM Type 705 data processing system (fig. 44), installed in March 1957, consists of the following component equipment: a card reader, 12 magnetic tape units, a central processing unit, a card punch unit, a printer, and a tape data selector with printer and punch unit. The monthly rental for single-shift operation is approximately \$32,000, which is increased on a use-incremental basis by second-shift operations.

106. INSTALLATION ORGANIZATION

a. System Engineering Section. This high-level group is responsible for the over-all planning of the installation and for systems analyses in connection with the statistical and accounting system of the army.

b. Programming Section. The programming section is divided into four units as follows:

- (1) Strength Unit. This unit is responsible for subject matter programming.
- (2) Processing Unit. This unit is responsible for programming all requirements in connection with updating the master record tape file.
- (3) Officer Qualification Unit. This unit is responsible for all programming in connection with qualification type reports.
- (4) Research Unit. This unit is responsible for the preparation of special programs and provides specialized assistance to other programming units.

c. ADP Operation Section. These personnel are responsible for the two-shift operation of the ADP equipment in the processing center.

d. Control Group. The control group is responsible for such areas as systems scheduling, machine utilization and cost data, and other similar considerations pertaining to the orderly completion of the required operations.

107. FUTURE PLANS

The future plans for the TAGO ADPS installation include a modified processing system for enlisted personnel with a view to economy in the operation of the enlisted distribution system. In addition, the ADPS installation will maintain data for and prepare the Army Troop Program, extend the master officers' record to include additional items of information, and modify the daily updating base to a less frequent base.

Section VII. CENSUS BUREAU

108. INTRODUCTION

Every ten years the U. S. Government, through the Census Bureau, is required by law to make a complete inventory of the nation's population, homes, and farms. The Government also inventories the status of the nation's agriculture, foreign and domestic trade, and governmental and industrial resources.

a. The scope and magnitude of such fact-gathering problems are tremendous. Millions of schedules and hundreds of millions of punch-card records must be developed and processed in such a manner that each person and resource is properly classified within the appropriate category.

b. The census is physically taken on both a de jure (legal residence) and a de facto (where actually residing) basis by an army of some 200,000 enumerators. Census takers visit every home, institution, and farm in the country to develop detailed inventory information on population and housing. The results of this massive fact-gathering operation must be controlled, screened, correlated, edited, and processed into a practical format.

c. In the past, the processing phase alone required the use of 10,000 people and a large number of punch-card machines working around the clock for approximately two years. It is anticipated that use of centralized ADPS in the future will result in significant reductions in the number of personnel involved and the amount of time required.

109. PLANNING FOR THE FUTURE

a. As far back as 1950, the Census Bureau sought a more efficient and economical method of census processing. Automatic data processing systems appeared to present a reliable and practical processing tool. Accordingly, the Census Bureau purchased its first general business-type electronic computer (Sperry Rand's Univac 1) to test its value in the processing of census data. This test of electronic techniques proved so successful that a second ADPS was added for further testing.

b. The Census Bureau has now developed and approved an entirely new processing approach to handle the data-reduction task expected in the 1960 census. The backbone of this approach is an ADPS which will be much more effective than those used in the tests. This system will replace the present two computers with components having greater memory capacities and faster operating speeds than the present equipment. Assembly and preparation of the raw data (schedules) for the computers will also be improved, because of the successful development and testing of document-sensing electronic equipment.