AN ANALYSIS OF DATA PROCESSING OCCUPATIONS

By

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CHAPTER I

INTRODUCTION

Vocational education became a growing national concern with the passage of the Vocational Education Act of 1963, even though related legislation had been enacted in the early 1900's. This type of education was presented as a major strategy in achieving a more effective utilization of human resources, in helping youth qualify for job opportunities, and in providing the means for workers to keep up with changes through retraining and updating of skills. The computer became a national concern in much the same manner as did vocational education. As more federal money for vocational training became available for public education by 1963 offering funding for over 410 occupations, so had computer-related occupations and processes permeated the world of work.

Vocational education encompassed computer-related occupations in the 1963 legislation and therein lay one of the nation's largest potential manpower-demand areas. In the original funding, data-processing education was classified as Technical Education; it was shifted to Business and Office Education in 1965.

Although there was little indication of an accompanying shift within standard vocational references such as the Dictionary of Occupational Titles by July, 1969, research literature was implying just such an evolutionary process getting underway within the labor ranks if not within education or within the resource materials available for

educators. This would seem to imply that the data-processing occupations with which some educators would be concerned might be closely related to the occupational spectrum in business education. It would also imply a degree of uncertainty both about existing and emerging occupations.

Legitimate questions might then be raised such as: If business education is to encompass computer-related occupations, will this involve training for a group of new occupations? Or, will the employees bear standard business-occupation titles and simply need different skills? Should they be "additional" skills; or "similar" skills; or "replaced" skills? Are answers to these and other related questions already available to educational planners? What is the current status of computer-related occupations and vocational education programs for them?

As early as 1961 electronic data processing equipment was a recognized part of contemporary society and there was a realization that people must be trained in how to operate related machines, but not one institution in the country offered a degree in computer science (Tondrow, 1961). Four years later, Nicely (1965) also affiliated vocational responsibility and public education:

> The complexity of modern civilization has produced EDP as a necessary means of achieving answers to problems with speed and accuracy. In only a few years the use of EDP has grown until the number of people who work in the industry has surpassed predictions; what is more, growth in the use of EDP has only begun it seems, and the need for trained people will therefore multiply. Responsibility for training data-processing personnel falls upon the public school system.

Two years later, Luskin (1967) reported that most of the comprehensive vocational programs had been patterned after the computer-programmer curriculum developed about 1961 at Orange Coast College in Costa Mesa,

California. Perhaps it was feasible to pattern education after one curriculum developed for programmers; however, a need for hundreds of thousands of other supporting personnel not only had been predicted, but became a reality (Nicely, 1965).

That public education had not accepted the responsibility of a comprehensive vocational training approach is evident from previous statements and from Awad (1971):

> Consulting firms, private business or technical schools, and universities have recently been active in offering formal systems analysis training programs, whose costs vary . . . . Among computer manufacturers, IBM is the only one offering users a six-month systems training program, at a cost of close to $6,000.

Literature revealed rather specialized types of education and identified no occupational array -- perhaps computer-related occupations consisted only of programmers and of systems personnel. If so, the status of existing programs was probably comprehensive enough. An occupational analysis would surely resolve this question relating to occupational identities.

There was no doubt about the demand for the occupations already identified. Peterson (1964) estimated that there were fewer than one million people directly involved with EDP in 1964, but that in 1970 there would be about three million. Employment requirements for system analysts and for programmers alone were projected to grow 100 percent or more between 1968-80 (Manpower Report of the President, 1970).

Awad (1971) set the number of installed computer systems at 85,000 by the end of 1970 and predicted 150,000 by 1975. Regarding employment, he placed the analyst shortage at 90,000 in 1971; the qualified programmer deficit at 100,000 for 1971-72; and predicted a severe shortage of qualified managers for the same approximate time period.

The occupations existed, nebulous though they were. Vocational educators had been challenged to turn human resources into employable products. Many educational institutions apparently had enough computer-systems proximity to educate for computer-related occupations.

Statement of the Problem

Because of industry's rapidly expanding use of the computer and because of vocational education's mandate to train employees for occupational changes, the problem of this study developed. Numerous requests for assistance at the state level had been received and they were becoming more frequent. Program feasibility, maximum student service, and practical economy of operation were a few typical questions to be answered. Information that could be used as guidelines and frames of reference for planning and implementing as well as for updating data-processing education was almost non-existent.

Purpose of the Study

Peterson (1964) felt that education could be developed in several ways -- the simplest method was to use what had been developed by another institution. But the most effective method was to develop an approach based upon up-to-date information about the work activities with which the education was concerned -- and thus, this research was undertaken.

The primary purpose of this study was to gather regionally applicable information potentially useful to vocational educators concerned with data-processing education. Four specific purposes were:

1. To identify, by occupational title, personnel engaged in automated data-control employment.
2. To identify tasks performed by these data-control personnel.
3. To develop both a job-title and a related task-cluster hierarchy.
4. To identify both the current and the projected usage status of computer equipment, input/out media, and programming languages used by the employers of this study's respondents.

Assumptions Basic to the Study

These concomitant assumptions were made related to the occupational analysis conducted for this study:

1. Data-control tasks existed outside the four commonly researched areas of programming, systems analysis, keypunching, and unit-record operating.
2. Data-control tasks were being absorbed by employees not bearing data-processing titles, particularly by those bearing office-occupations titles.
3. Job titles did not necessarily reveal the actual nature of the work performed by the employee.
4. Growing emphasis would be placed upon modern data-transmission and communication methods.
5. Clusters of tasks related to automated data-control could be identified.
6. Variation in job titles across occupational classifications would not necessarily mean variation in related tasks performed.

7. Occupational information could be developed into hierarchial format by job title and by related tasks.
8. Respondents providing data were accurate to the best of their knowledge.
9. The instruments for data collection were sensitive to the specific purposes under investigation.

Limitations of the Study

Geographically, this study was limited to west central Missouri. Jefferson City, Columbia, and Kansas City were the largest cities in the area. The population surveyed was limited to employees from a sampling of 45 of this area's businesses which were using automated data-control methods.

A concomitant limitation was that generalizations from the study's results were confined to the geographic area in which the data was collected or to a geographic area with a similar population of automated businesses.

Creative characteristics which were necessary for successful job performance, such as ideals and attitudes, resourcefulness and cooperation, dependability and tact were not appraised in this study. Nor was it within the scope of this study to set forth specific utilization of the data analyzed.

Definition of Terms

For the purposes of this study, the following definitions were used:

Information Flow: the movement of data through established channels within a business system.

Data-Control: integration of the information flow occurring in the operation of a business into a data-processing system.

Data-Processing: a cycle of processing data resulting from a business's information flow. The cycle includes data origination, input, manipulation, output, and storage. Data manipulation includes classifying, sorting, calculating, and summarizing.

Automated: information-handling processes incorporating mechanical and/or electronic devices as well as human effort.

Computer Generations: periods of time during which certain physical components were characteristic of certain computers.

EDP: (electronic data processing) data processing using electronic components. EDP is used throughout this study.

ADP: (automated data processing) data processing using mechanical and/or electronic devices. ADP is used throughout this study.

SIC: (Standard Industrial Classifications) standardized, nationally recognized categories of businesses and industries by type of function. SIC is used throughout this study.

CHAPTER II

REVIEW OF LITERATURE

In general, this aspect of the study was (1) an attempt to locate up-to-date comprehensive occupational descriptions; (2) an effort to discover any apparent occupational relationships between data-processing and business education; and, (3) an attempt to ascertain the availability of current, relevant, educationally-applicable information.

Business and office education was one of the new occupational areas to be federally funded in the 1963 Vocational Education Act and computer-related occupations were shifted into this funded business and office area in 1965. Education's role, according to the Act, was to help youth qualify for job opportunities and to provide the means for retraining and updating of skills.

Reviewing literature related to the purposes of this study provided an opportunity for deepening perspectives regarding (1) the status of computer-related occupations; and (2) education's assumption of the vocational-training role mandated by the 1963 Vocational Education Act.

Overview

Some researchers considered computer implications for administrators, aspects of planning, accountability, and teacher education. Others concentrated on career aspects, educational challenges, and the diversity of roles to be shared by institutions representing the

different educational levels, (i.e., junior colleges, secondary, adult, and higher education).

An apparent dichotomy visible in the literature was aptly described by Kaiser (1965):

> Almost one half of the students in Illinois' public schools are now served in one or more aspects by data processing methods. In contrast, 93% of the school districts have taken no steps to incorporate EDP into their curriculums. (See Figures 1 and 2.)

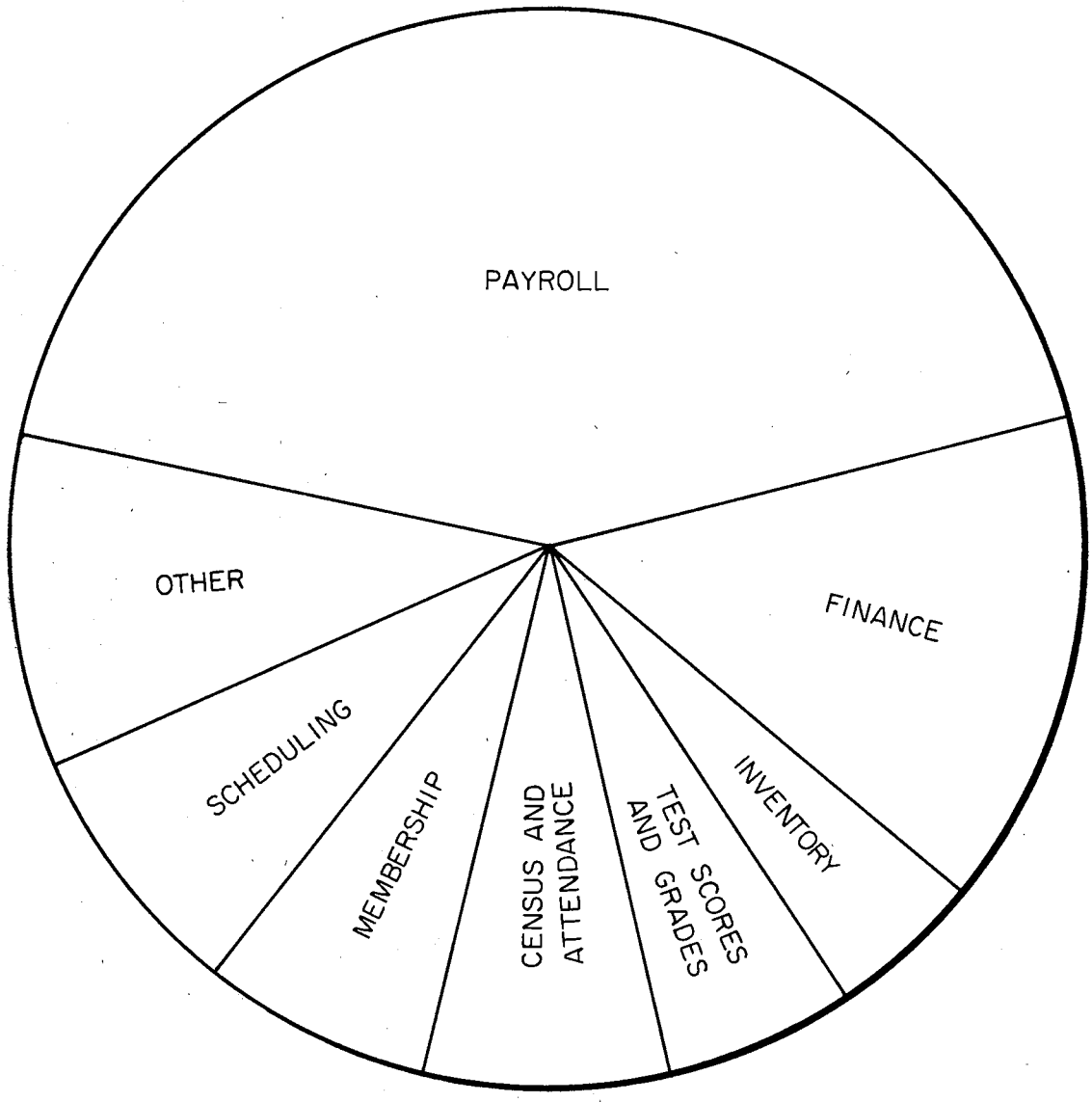
The literature's contents seemed to align into these two arrays accentuating the fact that there were different ways of viewing the last decade's technological developments in relation to education.

Presentations of typical selections from the review were, therefore, structured around these central pivots: (1) those studies dealing purely with education as a consumer of EDP services and systems; and (2) those studies reporting attempts to establish EDP education.

Education, An EDP Consumer

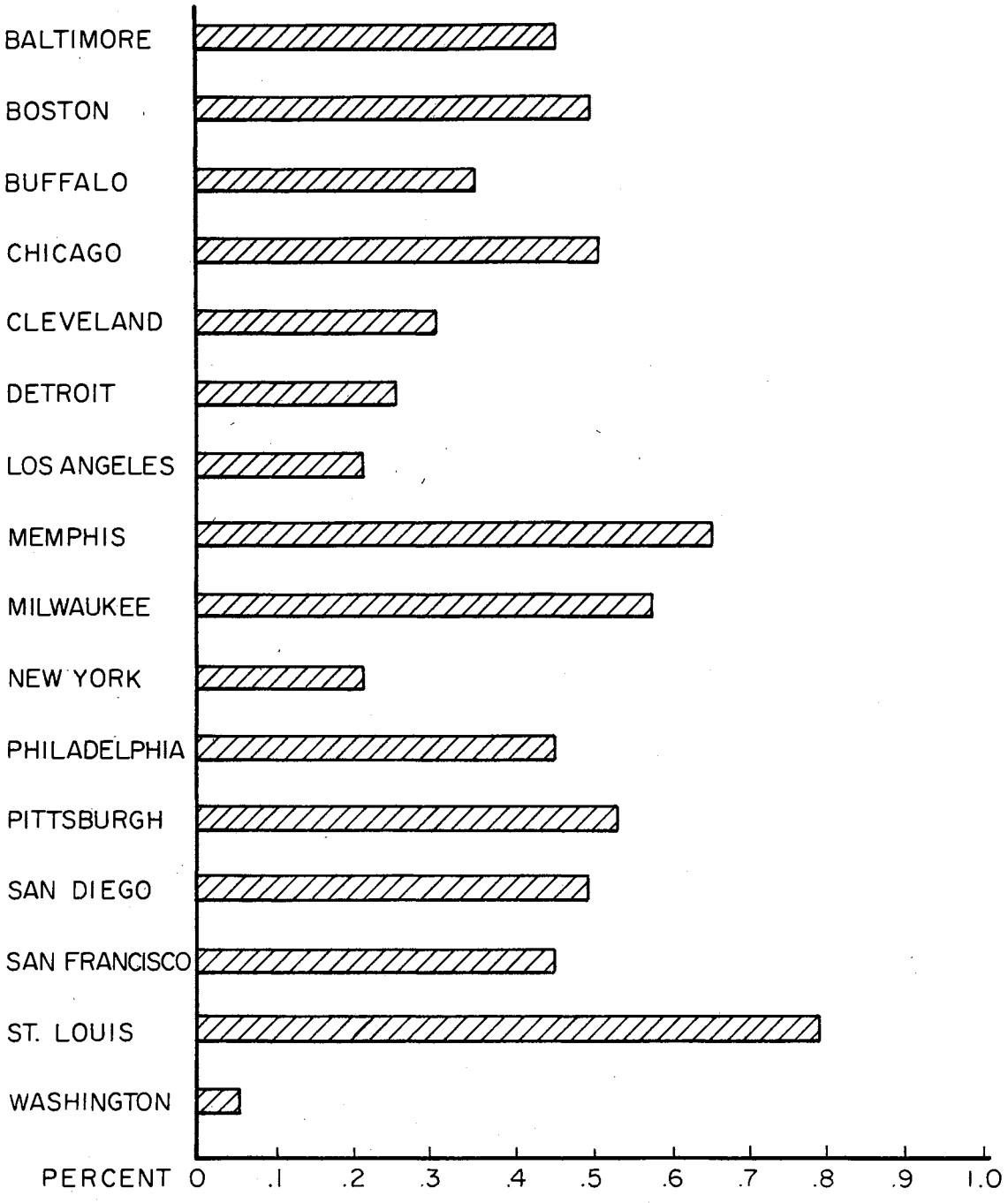
Typical of what was being written for administrators and planners was Kaimann's (1967) "Educational Data Processing--New Dimensions and Prospects." This anthology was concerned with information principles, effects, design, and integration of systems. The document considered uses for computers in reporting statistics, school census, attendance counting, grading, scheduling, and pupil transportation.

Also discussed were uses of computers in guidance research, population projects, enrollment predictions, construction scheduling, and the analysis of grades and class size. A final section was concerned with future prospects for increased centralized planning and more processing devices, reduced clerical burdens, improved organizational



Source: Research Council of the Great Cities Program for School Improvement.

Figure 1. What the Great Cities are Doing in Data Processing



Source: Research Council of the Great Cities Program for School Improvement

Figure 2. Data Processing Costs/Percent of District Budget

operation and control, expanded use of programmed instruction, and district-wide processing systems.

Computer applications ranged as far as the formation of data archives of unpublished research findings (Schoenfeldt, 1968), the development of "The College Suggestor" automated information system designed to match students and colleges (Walton, 1969), and the ISVD--Information System for Vocational Decisions (New England Ed. Data Systems, 1968).

The scope of education's consumption of EDP capabilities surpassed the imagination; projects of all types sponsored by agencies of all types were reported from all around the country. From using the Scribe System in teaching algebra, to developing modular scheduling, to compiling and classifying a source-document library on planning and construction of university facilities were atypical EDP applications. These reports came from Illinois University at Urbana (Frincke, 1964); Nevada Western State Small Schools Project sponsored by the Ford Foundation (Allan, 1963); and Texas A. and M. School of Architecture, respectively (Romieniec, 1968).

By far, the most elaborate and up-to-date system was described as being used for the New York statewide film library network which scheduled film use, reported on materials handling and statistics, and provided for interlibrary loan of films. Communications between the film libraries and the IBM/360/50 computer were maintained by teletype Model 33 ASR teletypewriter terminals operating on TWX (teletypewriter exchange) service, programmed mainly in S/360 assembler language (Sullivan, 1968).

Typical of higher education's approach was the Western Interstate Commission for Higher Education - WICHE - Management Information System - MIS. Thomas (1970) described the WICHE MIS system in his May, 1970 report:

> ... The purpose of the program is to make it possible to derive data which will be truly comparable for interinstitutional comparisons, while allowing institutional autonomy in such matters as coding and file structure. One of the major purposes of this section of the Dictionary* is to obtain longitudinal data depicting changes in characteristics over a period of time. The criteria for inclusion of data elements are: (1) necessary for completion of the Higher Education General Information Survey (HEGIS); (2) likely to be needed for cost exchange procedures, the student flow model; (3) necessary to link operational files together for the derivation of information; and (4) basic to the institutional record-keeping. *In six Sections.

In general, it was the later reports (1970-71) that showed stronger emphasis on accountability and EDP utilization in educational systems as a tool for operational concerns: cost/effectiveness models, regional data banks, and even a computer-based information, planning and budgeting system in the community colleges of Ontario (Systems Research Group, 1970).

The Iowa State Department of Public Instruction, set up a demonstration center to implement and test the school-property accounting system (using electronic devices) presented in Handbook III, U. S. Department of Health, Education, and Welfare (Burnham, 1967).

A study by the U. S. Office of Education (U.S.O.E.) in May, 1969, and conducted by the Central Midwestern Regional Educational Laboratory (CEMREL), seemed to summarize education's use of EDP.

> CEMREL analyzed educational computer trends in the region between 1967-68 and 1968-69 and found that there was roughly a 50% increase in EDP installations. Computer and remote terminal installations also increased 50%, but the proportion of computers under school systems or district control decreased slightly.

> These computers were oriented primarily to administration needs. Finance and pupil categories each accounted for about 1/3 of all computer application; research and planning and facilities each accounted for about 15%; instructional programs and personnel applications were only 5% each.
>
> The minimum cost reported for all operations performed by a particular installation was 10 cents per pupil per school year and the maximum was $12.26. Present trends indicate that the computer is being used in schools to solidify practices of questional educational value, such as testing, grading, and scheduling students by compartmentalization rather than by individualization. A strong recommendation is that federal support be given to foster a polycentric (many-centered) development of computer resources, rather than encouraging each school system to install its own equipment (Ohlman, 1969).

Education appeared to be a voracious EDP user, ironically providing computer-related employment for many persons yet offering training neither for the persons nor for the occupations, at least in the research reported to this point.

Quite a volume of information seemed available for educational planners; the selected research results presented were typical. However, the extensively developed computer applications seemed more operational than educational in nature. They seemed to encompass everything in education except educating students for vocations.

As far as the purposes of this study were concerned, perhaps the aspects most valuable and most relevant to vocational EDP training were that (1) education seemed well aware of computers' myriad applications and was willing to use them; and, (2) education's apparent proximity to EDP systems would seem to indicate relative ease of incorporating student training as a concomitant function of the computer system (Systems Research Group, 1970; Thomas, 1970; Research Council of the Great Cities Program for School Improvement, 1969).

According to Sullivan (1968), the 1965 capital value of college and university computers was 1/26th of the U. S. total and the cost of

computers used in instruction was 1/220th of this total. Annual expenditures by 1971-72 would amount to about $400 million if the recommended level of usage was attained. The implications for training in all sectors was evident, according to this researcher.

As Tondrow (1961) stated, "One of the more formidable phenomena that any new endeavor in education faces is that of inertia." Apparently the inertia was in initiating and pursuing true educational applications of the computer and not in utilizing its operational assistance in education.

Tondrow (1961) had also stated that this inertia is not in and of itself bad and that a profession should not adopt every fad that occurs. That the computer concept was not a fad was emphasized aptly by the President's Science Advisory Committee (1967) who expressed the situation: "After growing wildly for years, the field of computing now appears to be approaching its infancy." Similarly, vocational data-processing education seemed struggling to surpass its infancy.

Breaking the Curriculum Barrier

Curricular inroads varied; Koschler (1965) said that instruction of both scientific and business data process "have been started" -- not "are well underway" from high school through university levels. Educators still looked to the past while manpower and hardware projections reached 1990.

In February, 1969, the Research Council of the Great Cities Program for School Improvement indicated what schools were doing in data processing; and, vice versa. Most of the schools used first and second generation hardware. Clark (1967) also indicated that third generation

installations were being implemented in business before educational institutions completed the transition from first to second.

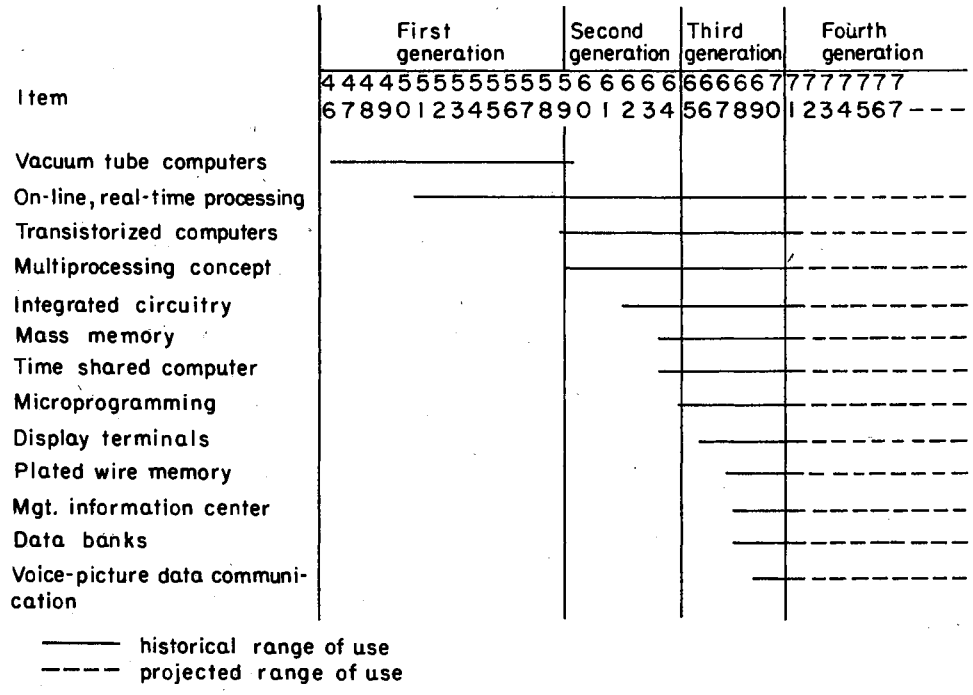
The nature of the feelings of "those who cared enough to plan" were fairly uniform:

> In analyzing job openings of today (Oct. 1963) and the future, the Washington State Board for Vocational Education found what every other vocational program has found--that training and education in data processing represented one of the greatest job opportunities and at the same time the most pressing needs of business, industry, and government.
>
> In developing a data processing curriculum, a vocational school has two choices. It can duplicate programming courses provided by computer manufacturers, or it can provide the kind of education and training that both manufacturers and their customers want. The former takes approximately four weeks; the latter, approximately two years (McKee, 1963).

Reaching compatibility between the labor market and the labor producer seemed to be the problem. For example, an educational program modeled after a 1961 programmer curriculum could have trained an employee for a 1969 entry-level labor market position and a potential 1972 - 1975 promotional market!

Even if an institution decided to train personnel other than programmers, the priorities of languages, time, and immediate employment area were raised (Clark, 1967). Timing would be essential because a student entering a training program in the fall could enter the labor market within two years and would probably reach peak potential in 5 - 8 years.

Considering this timing factor is one criterion not only for identifying relevant occupations, but also for ordering them into some format that could parallel sequential training levels. Bangs (1968) produced matrix after matrix of promotional patterns indicating career ladders at least for the four standard data-processing occupations.



Source: Business Data Processing, p. 44

Figure 3. Illustration of Computer Generations

One of the most unique curriculums was proposed for a New Jersey Technical High School by McGonigal (1967) who recommended career education beginning in the 9th grade with a six-week, 67.5 hour, 19-unit exploratory course. He had found that entry positions included tabulating machine operator, wireman, and computer programmer trainee; and that most companies hired people who were caple of advancement in this field. He also proposed programs for grades 10 - 12.

Business Education Becomes Involved

LaSalle (1964) pinpointed the secondary role in his study of the role of the business education department in preparing students for employment in business offices using data-processing equipment. Getting at the dualism of the role, LaSalle said:

> Automation is a label for an important trend in the business world of today. Problems of labor displacement, with some occupations becoming obsolete and others disappearing entirely, have accompanied this growth of automatic technology.
>
> The secondary schools have been challenged to adjust their programs to the new and added demands made upon them by the extensive social and economic changes which have taken place. Business education departments . . . have been encouraged to re-examine the content matter which is included in their courses in light of the changes stimulated by office automation. Little emphasis has been given by these departments to instruction on automation especially in regard to automatic equipment operation.
>
> Business education departments in secondary schools should offer a separate, one-year course on automation at the 12th grade level. Workers in automated business offices generally are expected to possess skills in areas of communication, problem solving, and logical thinking, as well as in being able to get along well with others.

Specific course content was not specified in this dissertation.

While studying office occupations in Washington in 1968, Perkins (1968) was not looking for information about relative performance of

tasks, frequency of performance, portions of worker time used for performance, or levels of ability involved in performance. However, in clustering 599 tasks into 13 major categories, he discovered that data processing workers were performing significant numbers of office tasks:

Percentage of DP Workers Performing Task	Task Performed
20-59	Typewriting
20-80+	Operating Office Machines & Equipment
21-46	Mailing tasks
20-70	Filing tasks
25-70	Telephone and Communication tasks
20-50	Clerical tasks
20-79	Securing Data (this appeared to be the largest discriminator)
21-90	Use Mathematics
20-30	Financial and Recordkeeping tasks
20-75	Meeting and Working with People
25-55	Misc. tasks -- dust, run errands, make coffee, etc.

(Perkins, 1968).

Teaching a body of knowledge applicable across several different areas has been labeled the "cluster concept". That this application or approach would facilitate data-processing programs was inferred from an HEW sponsored study of electronic business data processing peripheral equipment occupations and suggested curricula (U.S.O.E., 1964). Occupations considered were: tape librarian, keypunch operator, clerical supervisor, coding clerk, machine-records unit supervisor, statistical clerk, tabulating machine operator, and console operator. Subjects for each occupational course of study were drawn from general office education units, including subjects common to two or more occupations, and specialized occupation units. This curriculum was suggested for trainees

who had completed approximately 10 years of formal education and had a working knowledge of English and elementary arithmetic (U.S.O.E., 1964).

Bangs (1968) had also suggested studying employees in integrated data-processing programs in selected business offices to determine the common body of knowledge needed. In addition to suggesting course placement along the educational hierarchy, researchers were also beginning to suspect an occupational commonality between "office" employees and "data-processing" employees.

Higher Education's Role and Challenges

A few writers urged "hands-on" and/or on-the-job experiences as a part of the data-processing curriculum. Among these were Clark (1967) who suggested the activity as a portion of a fourth-semester in a two-year junior college program.

> The practical requirement of processing large volumes of data and calculations places an educational burden upon the school system to provide student training in today's method of handling this giantic problem.
>
> One of the minimum graduation requirements in several well-known colleges and universities is an EDP survey course. Other schools such as West Point are requiring actual student use of a computer before graduation is permitted.
>
> The knowledge base required in this area is becoming so wide spread and complex that it is now almost impossible to provide adequate instruction in a two-year terminal Junior College program. One solution is to start the training in high school and to continue (Koschler, 1965).

Koschler (1965) and others recommended: (1) general education as the primary objective in undergraduate school; (2) two hours of ADP required of all business students; (3) additional six hours at the graduate level for students specializing in the area.

Hinting at the career-education, as opposed to the mere entry-level aspiration, he indicated that the responsibility of the public high school seemed to lie in the area of providing such education as would allow the prospective employee to adjust to situations in all kinds of installations.

Howell (1964) agreed that it was becoming increasingly apparent that a knowledge of the business uses of digital computers was rapidly becoming indispensable for dealing with the large body of data involved in modern business transactions.

Delving into the junior college's obligation, he submitted that the junior college had traditionally served two types of students: (1) the student who planned to transfer to a four-year college or university; and, (2) the student who required some, but less than four years of college for his particular vocational objective. He proposed that several types of information were essential if the growth of the computer programs were to proceed along "orderly and efficient guidelines" with the necessary transitional links from educational level to level (Howell, 1964).

At the time of Howell's study, Los Angeles junior colleges were faced with this type of local interest: enrollments in February, 1964, in business data processing filled two-day classes with 57 students; night classes in the same subject required eight classes for 390 students. This was true in many of the area's junior colleges -- another ran a one-day class for 31 students; four night classes for 153 students (Howell, 1964).

A pilot program in high school data processing was developed cooperatively between Orange Coast College and Costa Mesa High School

(Luskin, 1967). Interested students who completed the high school program and received the recommendation of the instructor, were allowed to take a screening examination and to waive the introductory course at the College.

As to business' consensus, one recent study revealed this challenge: slightly more than 93% of interviewed managers said that data-processing managers should have more than high school training, with nearly two-thirds of them stating a preference for a college degree as the minimum educational level; according to 87% of the managers, the systems analyst should have a college degree (Clark, 1967). Cook (1966) did find that high school training was sufficient for entry-level positions.

Need for Information at Federal Level

The federal government had instigated the development of punched-card information systems in 1890 and had used computers during World War II. In May, 1968, a conference was held in Washington, D. C. with the objective of determining recommendations for establishing an "effective and efficient automated data processing (ADP) training program for their own computer-system analysts and managers" (Sullivan, 1968). Apparently, adequate information was still unavailable even for so powerful a demand.

According to Project Director Sullivan (1968) federal government agencies such as Office of Education, Civil Service Commission, National Bureau of Standards, and the Bureau of the Budget had an immediate and pressing need to define those curriculums or bodies of subject matter knowledge required by two groups of federal employees already described.

This need was expressed by the nation's oldest computer user and by an entity whose expenditures on hardware and software alone during the "three most recent fiscal years" averaged $840 million per year within the federal government (Sullivan, 1968).

"Personnel implications are clear when account is taken of the growing share of the expenditures devoted to software (42 percent in FY 1964 to 51 percent in FY 1966)." Software was later defined as "That effort required to convert subject matter to a form which can be retrieved by the learner in a manner that will achieve the educational objective" (Sullivan, 1968).

This one federal task force brought together 45 participants including subject-matter specialists, resource specialists in programmed instruction, educational-technology manufacturers, ADP training consulting firms, industrial firms and federal government officials in an effort to discover "with what and how to" re-educate an estimated 100,320 government employees. One major conclusion was:

> Without exception, representatives of equipment manufacturers reported the number one problem as software; not machine languages, but the shortage of subject-matter specialists who could define educational objectives, arrange instructional material in programmed format, or otherwise program curriculum material for application and use on technological hardware -- whether computer assisted instruction (CAI) or otherwise (Sullivan, 1968).

The inference here was, that in spite of the growth rate of ADP and related education in colleges and universities, the number of those trained in needed courses was accelerating at a rate substantially below the need for the computer industry, the federal government and other users.

Luskin (1967) described the transitional occupational situation with which a few institutions were attempting to keep pace:

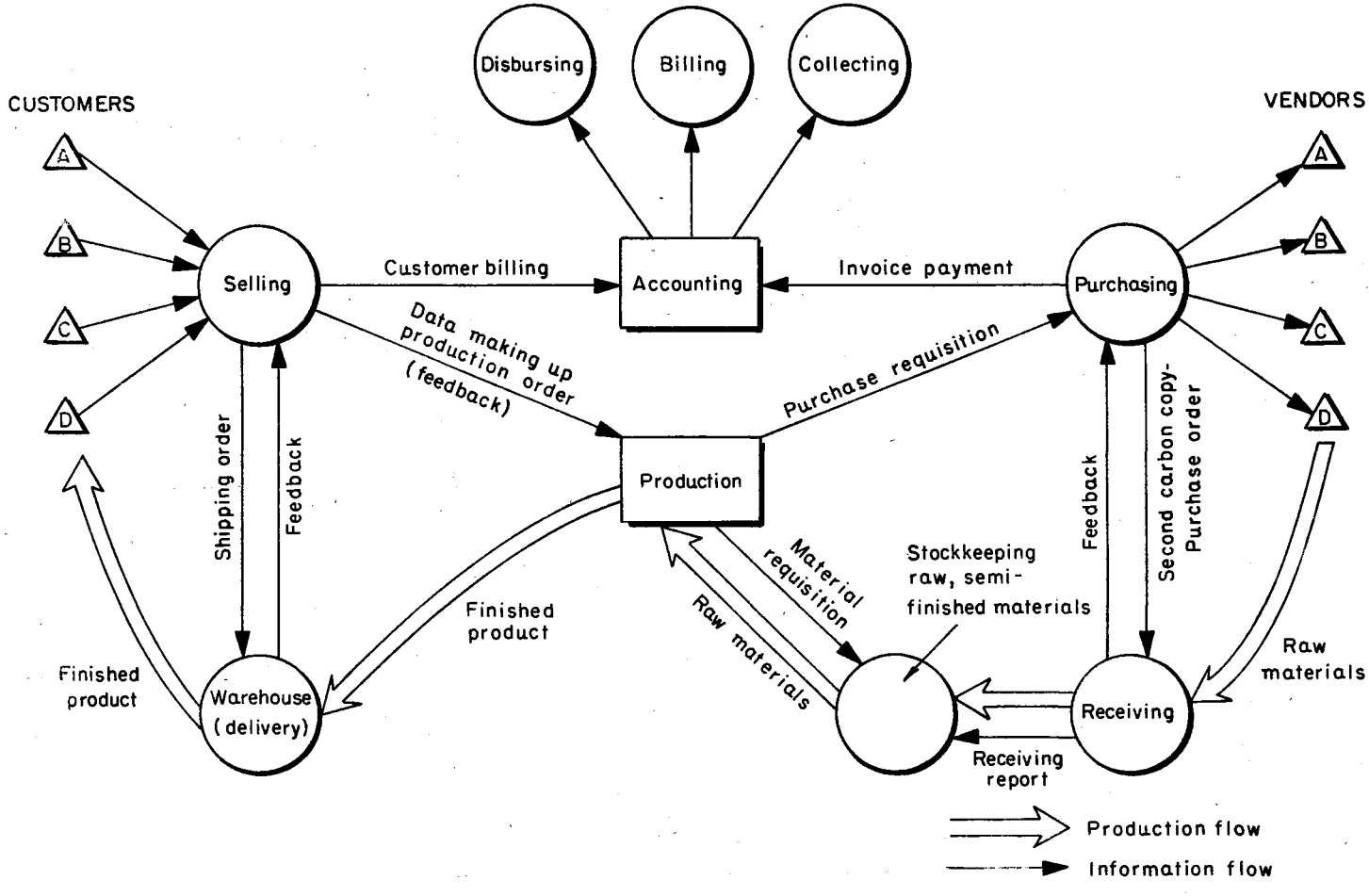
> The need for computer programmers will increase 250% within the next six years. By 1970, it is predicted that the market for computers will be over $10 billion. Total figures for the last 10 years show a steady $1 billion a year increase in annual computer investment; 1965 showed an increase of $2.5 billion. Even forgetting exceptional years, the value of computers by 1980 would be $20 billion a year and by 1990 over $30 billion. By the end of the 1970's, the number of computer installations will, at the present rate, at least double.
>
> IBM reports that needed today (April, 1966) are 80,000 programmers, 60,000 analysts, and 100,000 other supporting personnel. In ten years the need for programmers alone is expected to rise to over 175,000.

New Occupations Predicted

In addition to transitional time-lag and lack of current information bases, a third dimension seemed to have developed. This was the idea of an emerging career and/or of an obscured occupation. The idea was suggested by several researchers: Koschler, 1965; Clark, 1967; Newman, 1967; Bangs, 1968; Perkins, 1966; and McGonigal, 1967.

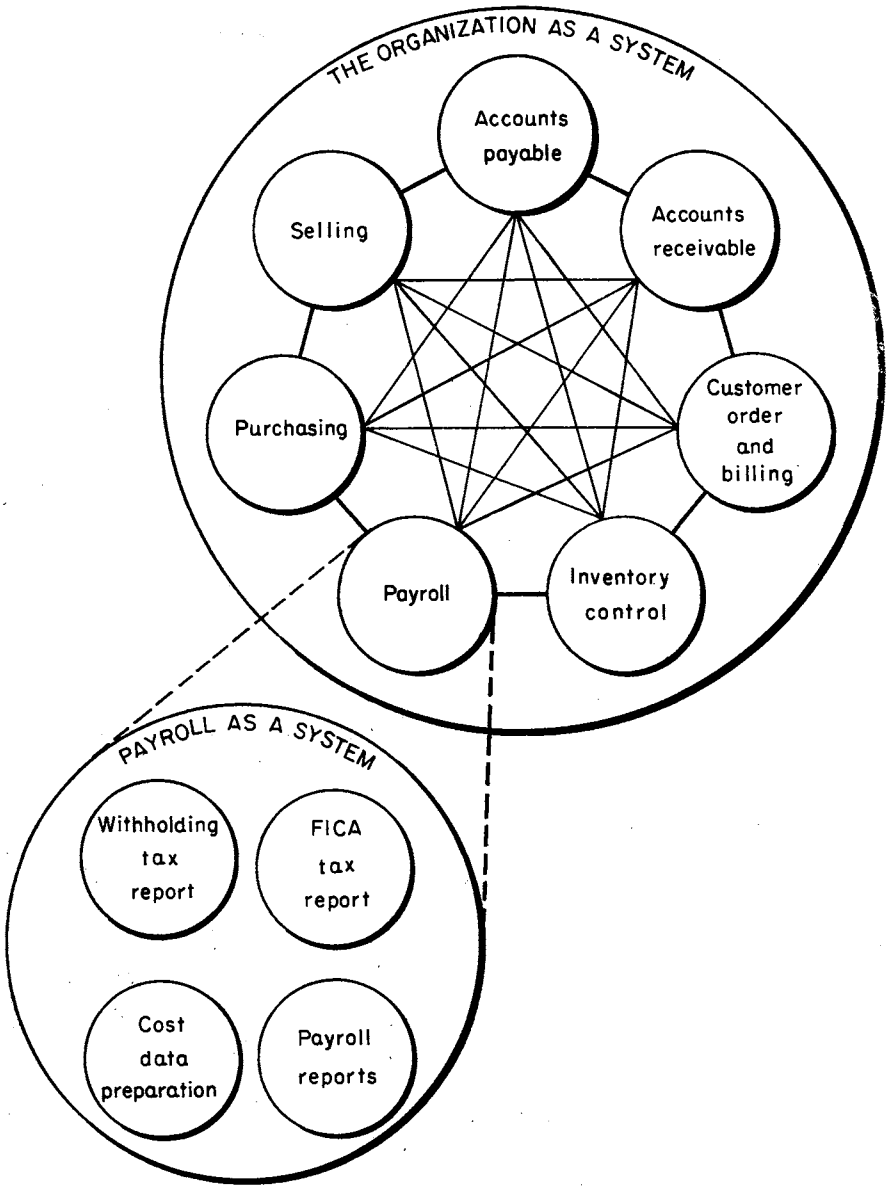
A Dade County Junior College study said, "More important, perhaps, than the total number of openings likely to occur (in data processing) is the possibility that job requirements may change in this field of work!" (Koschler, 1965).

Discussing "The Changing Field of Internal Accounting," Newman (1965) found that the contents of many positions had changed while their names had remained essentially the same. After interviewing 20 producers and 99 users of ADP equipment, he concluded that new positions which had been added since the advent of ADP were of two types: those directly related and those indirectly related to the utilization of the new equipment. He also indicated that the basic need of employees who were involved in dealing with the accounting functions studied was an



Source: Business Data Processing, p. 55.

Figure 4. Illustration of Information Flow



Source: Business Data-Processing, p. 54.

Figure 5. Illustration of Data-Control

understanding of the data flow through the systems utilized in the business.

A September, 1968, study at the University of Colorado revealed (1) that persons who will be classified as Applications Specialists would be increasingly in demand; (2) that an administrative level position would possibly emerge with a person known as an Automated Data Management Specialist responsible for deciding what to do with the data from the computer; (3) that regular clerks in time-sharing installations would be responsible for putting data into the ADP system and would not necessarily hold a job classified as a data processing position (Bangs, 1968).

The Rutgers Technical High School study using unit-outline plans to provide flexibility to update or to change courses as needs of students and of the data-processing industries changed (McGonigal, 1967). An Orange County Junior College study discovered (contrary to some predictors) that students who had completed card, printer, and tape or disk programming would have little trouble working with any other hardware devices. It also predicted that electro-mechanical equipment and employment was probably to be with us long into the future (Clark, 1967).

Chapter Summary

The literature indicated (1) a prevalence of EDP installations in educational institutions which are not being used as vocational training tools; (2) few curricular inroads were spotting the country; (3) despite the challenges for all levels of education, there was still a lack of current information for educational planners. Although a great deal was said about systems personnel and programmers, no comprehensive

occupational spectrum for computer-related occupations was identified. Information about the supporting and satellite occupations was missing, but an infiltration of data-processing tasks into the office occupations was noted.

Very little was said about (1) current data-transmission practices, (2) new systems and affiliated programming languages, (3) anticipated hardware and software changes, (4) indications of simultaneous phasing of education with business demands, or (5) investigating education as a manpower-consumer area.

With national and local implications what they were, proposing to survey both the manufacturers of and the users of data-control services seemed not only timely and feasible, but also the only rational course toward developing or maintaining adequate data-processing career education in west central Missouri.

CHAPTER III

DESIGN AND METHODOLOGY

This chapter describes the study's research design, the population and sample used, and also contains explanations both of the data-collection instruments and of the computer programs used to process the data.

The primary purpose of this study was to gather regionally applicable information useful as guidelines or as frames of reference for planning, implementing, and/or for updating educational data-processing programs. Specific purposes were:

(1) To identify, by occupational title, personnel engaged in automated data-control employment.

(2) To identify tasks performed by these data-control personnel.

(3) To develop both a job-title and a related task-cluster hierarchy.

(4) To identify both the current and the projected usage status of computer equipment, input/output media, and programming languages used by the employers of this study's respondents.

Design

In accordance with the stated purposes of this study, an occupational analysis was used which, according to Van Dalen (1966), would be categorized as survey-type descriptive research design. He defined job

analysis as "obtaining an analytical knowledge of job components. . ." and further qualified survey studies as collecting ". . . detailed descriptions of existing phenomena with the intent of employing the data to justify current conditions and practices or to make more intelligent plans for improving them."

VanDalen (1966) justified using descriptive research by saying "before much progress can be made in solving problems, men must possess descriptions of the phenomena with which they work." Peterson (1964) also suggested support for research designs that would collect up-to-date information about the work activities with which a vocational program was concerned.

Population and Sample

All of the data utilized in this study were responses from an employee-sampling from 45 selected west central Missouri businesses which were using data-processing services from some type of computer installation at the time of the study. This geographic location was selected to correspond with this study's purposes of gathering "regionally applicable" occupational information.

A population of computer users was located in this manner:

(1) A listing of computer-manufacturers servicing the geographic area being surveyed was compiled from local telephone directories and was confined to "The Big Eight" firms which dominated the computer-manufacturers' market as described by Awad (1971): IBM, 72.0%; Univac, 7.0%; Honeywell, 3.5%; Control Data, 3.0%; RCA, 2.6%; General Electric, 2.5%; Burroughs, 2.4%; NCR, 2.0%; Others, 5.0%.

(2) All of these major computer manufacturers were servicing west central Missouri with the exception of Control Data and a management-representative from each of the other seven was personally contacted first by telephone and then by appointment when requested. The personal contact was used to explain the purposes of the study and to develop a list of computer users.

(3) Manufacturers were asked to suggest names and addresses of local users in each of the Standard Industrial Classification (SIC) Codes, if possible, and to include a range of installation sizes within each of the codes. No limitation was placed upon the number of installations to be suggested by each manufacturer. The SIC code classifications, which provided a commonly used method of grouping businesses (Perkins, 1968), included: (1) Agriculture; (2) Mining; (3) Construction; (4) Manufacturing; (5) Transportation; (6) Communications and Utilities; (7) Wholesale Trade; (8) Retail Trade; (9) Finance, Insurance, and Real Estate; (10) Services; (11) Government; (12) Education; and (13) Other -- non-education categories.

As a result of the manufacturer contacts, 52 possible business participants were suggested; 45 contributed data for this study. One business declined to participate; three others were not asked to participate because, even though they would have rounded out the SIC code representation, they were located outside of the specified geographic area. For example, two of the suggested computer users were across the Missouri-Kansas state line. The remaining three businesses agreed to participate

but did not return the data-collection instruments.

The actual respondents in this study were 400 employees within the 45 participating businesses. The specific employees were selected by a management representative from each business. The criterion for employee selection was that each employee be working in some phase of data-control or data-processing as defined in Chapter I.

Instrumentation

Three data-collection instruments arbitrarily designated DCP-1, DCP-2, and DCP-3 were adapted for this occupational analysis. Three explanatory forms, DCP-2 "Sample-Completion", Supervisor's Summary, and a form letter, were also used (see Appendix A).

Form DCP-1 was a general information and installation description sheet which was completed by a management-level employee in each participating business. Form DCP-2 was a Task Listing Sheet completed by selected employees in the participating businesses. Form DCP-3 was an Employee Log Sheet that requested the same selected employees to describe the previous day's work activities.

The bulk of the data collected resulted from Form DCP-2, an adaptation of a Task Listing Sheet described by Mager and Beach (1967), which was used in this study for two reasons. First, the field-tested instrument was originally developed pursuant to a contract with the U. S. Department of Health, Education, and Welfare; Office of Education; under provisions of Title VII-B of the National Defense Education Act; and, secondly, the philosophy quoted below was the one underlying the instrument's development and seemed in accordance with the purposes of this study:

> Regardless of the subject matter, the object of vocational instruction is to send the student away capable of performing satisfactorily on the job; . . . to achieve this goal, it is necessary to know what the job consists of, what one needs to do to perform each of the tasks, and how frequently each of the tasks is performed (Mager and Beach, 1967).

Form DCP-3, the Employee Log Sheet, was a supplement for the Task Listing Sheet and was an attempt to protect the data's validity by preventing an employee's simply copying a prepared job-description. Its use was also encouraged by a member of the committee supervising this study who foresaw a possible difference between an employee's over-all perception of his job and the job components as revealed from a listing of one day's actual activities.

Form DCP-3 actually contained data from two respondents: the selected employee and a management-level representative of the employer. The latter received the partially completed form from the employee and then coded in the data requested at the top of the form. Instructions for this coding appeared on the Supervisor's Summary (see Appendix A).

Instrumentation described to this point corresponded with the first three specific purposes stated for this study. Form DCP-1 corresponded with the fourth specific purpose; it was patterned after the format used by Cook (1966). This instrument requested current and projected data describing the computer-installation components, input/output media, and programming languages. It also collected items such as SIC code, business size, and location used for grouping and for qualifying data items during processing. Also used as frames of reference for developing this study's data-gathering instruments were designs suggested by Howell (1964), Perkins (1968), McGonigal (1967), and Hardwick (1968).

Data Collection

Although this study's data-collection instruments were expansions of ones that had been used in previous research (Mager and Beach, 1967), (Cook, 1966), it was desirable to discover whether or not they would be effective for this study. It was also desirable to discover the approximate length of time necessary for an employee to complete the forms.

Therefore, before the actual data-collection began, the instruments were submitted to a "jury of experts" (Hardwick, 1968) composed of Missouri State Department of Education and local data-processing personnel. They were field-tested twice in Jefferson City businesses, revised slightly as a result of the testing, and re-submitted to the same jury as well as to the chairman of this doctoral committee. Form DCP-2 "Sample Completion" (see Appendix A) was added to the instrument set at the suggestion of the testees during the pre-testing phase.

Original contact with the 52 potential business participants was made by telephone. Either the person named by the manufacturers who submitted the list of businesses or the personnel manager of the business was contacted. A very brief explanation of the study was given in this telephone contact and 30-minute appointments were made with 45 of the businesses.

During the agreed upon appointments, the project and the data-collection instruments were explained. Sets of these instruments were left for distribution to selected employees if the business representative agreed to participate in the project. At the same time, retrieval dates for picking up the completed forms were agreed upon or postage-paid mailing envelopes were left for the instruments' return.

Only in four cases was personal contact with the participating business restricted to telephone conversations. In these cases both the form delivery and form return were handled by mail.

In all 49 cases, the business contact was asked to distribute forms to employees engaged in data-control or data-processing as defined in Chapter I. It was suggested that not all of the employees bearing the same job title within the business need complete the forms unless the jobs were different in nature although not different in title.

A total of 400 sets of usable returns (one set per employee) were received from 44 of the 49 businesses contacted. One business declined to participate; one business's returns were discarded because of insufficient data. Despite two telephone follow-ups each, the reamining participants did not return any data. One of these data sets was believed to be lost in the return mailing.

A work force of approximately 1,400 employees was represented by the 400 sets of forms returned. A set consisted of a Form DCP-2 and a Form DCP-3 (see Appendix A).

Data Treatment

Four-hundred employee data-sets, composed of responses to Forms DCP-1 and DCP-2, were coded and keypunched into a 2,500-card data deck according to the punched-card formats designated card types 3 and 4 (see Appendix B). Since the tasks were punched two per card, a gross total of 4,200 tasks were recorded -- 400 of the 2,500-card deck were job-title cards leaving 2,100 as task cards. These two-card types contained data items relative to the first three specific purposes of this study.

Computer installation data from Form DCP-1 was coded and keypunched into 44 two-card data sets designated card types 1 and 2 (see Appendix B). These two-card sets contained data items relative to the fourth specific purpose of this study. Formats designated card types 5 and 6 (see Appendix B) were designed for miscellaneous data items not directly specified in the stated purposes of this particular study. Therefore, they were not keypunched because of time and volume constraints. For example, a straight listing of the data that was used for this study ran 46 pages of computer printout with 55 lines per page.

Data items labeled on the card-layout form and specific coding conventions followed during initial recording were described in Appendix B. In coding tasks, the primary concern was retaining the employee's meaning. The employee's own wording was retained where possible. Spelling errors were corrected and logically similar items were coded by the same title. For example, "answer telephone" and "receive calls" were both considered "telephoning" and were so coded. A convention of getting the most revealing descriptor coded as the task's first word was followed.

Seven computer programs written in Fortran IV, Level G, were used to process the data (see Appendix C). Programs 1 through 6 required processing the entire 2,500-card data deck; Program 7 required using only the 88-card installation data deck. Specific processing notations were recorded in Appendix C with each program.[1]

In general, Program 1 extracted all of the alphabetic data (job titles and tasks) from the data deck and listed it in readable format.

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[1]Programs were written by Dr. Donald Allen, Sociology Department, Oklahoma State University.

The printout contained no analysis; neither it nor the program were included.

Program 2 bypassed task cards, processing only job-title cards, and produced (1) a purged alphabetic ordering of job titles along with two related numerical data items; (2) the same listing re-ordered by average-salary; and, (3) a set of punched cards to be used with later programs. As a result of the purging, each time identical job titles were encountered, their related numeric data items were combined and the job title itself was permitted to appear only once in the output. For example, 40 "Computer Operator" job-title cards may have occurred in the 2,500-card deck, each having its own accompanying set of numeric data items. After the deck was processed with Program 2, the title "Computer Operator" appeared only once in the printout and the 40 individual sets of related numeric items appeared as a single composite set listed opposite the job title. The same purging pattern was used throughout the processing of the data. Program 2 provided the occupational titles sought in the first specific purpose of this study.

In essence, Program 3 did the reverse of Program 2. It processed only task cards and produced a purged alphabetic ordering of tasks along with six related numeric data items. These items included how many times a task was performed by the reporting employees; how often the task was performed; the task's importance; and three indicators used to tally the number of times a task was reported on a particular data collection instrument. Output from Program 3 provided the task-identification desired for the second specific purpose of the study.

A combined, purged task listing and job-title listing was produced by Programs 4 and 5 which also arranged the combined output in ascending

order according to the average pay associated with each job title. Average salary, standard deviation of the salary, and promotable percentages were computed for each occupational title. Programs 4 and 5 provided the job title and related task-cluster hierarchy corresponding to specific purpose number three.

Program 6 reversed the relationship established by Programs 4 and 5. Whereas, 4 and 5 showed an unduplicated listing of job titles with accompanying tasks, the output from 6 revealed each task followed by every job title that had mentioned the task. Not only was this output an unduplicated task-list, it was a "shared" task-list. To appear in this output, a task had to have been mentioned by at least two different job titles. The "shared" task criterion was included because this program also produced information related to specific purpose number three.

Program 7 generated the usage status referred to in purpose number four. Data on 14 installation components were tabulated by business location and size. Each component was also tabulated under these four categories: (1) units in use; (2) units to be discarded by 1975; (3) units added since 1968; and, (4) units to be added by 1975. Eight input/output media and seven programming-language categories were tabulated by business location and size and by types to be added by 1975.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The purpose of this chapter is to present and to examine the results of the study as represented in Tables I through VII. Data was collected on occupational-analysis forms (see Appendix A) from sample groups of employees identified in Chapter III. Preliminary data-tabulation for presentation in this chapter was developed with the aid of seven computer programs (see Appendix C).

Data relating directly to each specific purpose of this study is presented in separate tables, and this chapter is organized with a section for each of these purposes. Discussions of each table include (1) a general introduction to the data items being presented; (2) a sample "reading" of the table; and, (3) specific elements for consideration.

Purpose Number One

To identify by occupational title personnel engaged in automated data-control employment.

Table I identifies 178 different occupational titles held by data-control personnel in west central Missouri. It also presents 12 values related to each title and identifies the employers' SIC codes.

Six of the related values (pay, edmn, hire, $trn, ed-$, and dx) are averages computed by a standard mean-formula (Popham, 1967, p. 12). Columns "loud, mob, stop, and tsks" are percentages of

GENERAL: Alphabetic, unduplicated listing of job titles.
Columns F, 2 - 12, Tot, are totals; last five are percentages; remainder of numeric items are averages.

Zeros indicate no data reported**

Column	Contents
1.....	Line Number
2.....	Job Title
F.....	Frequency of title's appearance
PAY.....	Average salary for title; if calculated from raw data, base was always 40 hrs. weekly; 4 weeks per month; 12 months per year.
2.....	Standard Industrial Classification Codes:
.	2 = Mining
.	3 = Manufacturing
.	4 = Utilities
.	7 = Void in this study
12	8 = Retail trade
	9 = Finance, Insurance, Real Estate
	10 = Services
	11 = Government--non educational
	12 = Education
EDMN.....	Minimum Education Recommended by employer:
	1 = high school
	2 = jr. college
	3 = degree
	4 = other
HIRE.....	Hiring Difficulty indicated by employer:
	1 = very difficult
	2 = difficult
	3 = no problem
TOT.....	Number of employees bearing same job title. **In case of 0, substitute 1.
$TRN.....	On-the-job training cost indicated by employer; field was not to 4 digits (dollars) and was keyed $9,999 in overflow situations.
ED-$.....	Employers' indication of whether or not education could have lowered the on-the-job cost:
	1 = yes
	2 = no
LOUD..... MOB STOP TSKS	Employees' indications of whether or not they felt that noise, crowding, interruptions, and extra tasks detracted from their efficiency.
DX.....	An average of the four previous columns.

Figure 6. Coding Legend and Reference for Table I

TABLE I

JOB LIST ORDERED BY ALPHABET AND BY SALARY IN DATA PROCESSING

NO.	JOB TITLE	F	PAY	2	4	6	7	8	9	10	11	12	EDMN	HIRE	TOT	$TRN	ED-$	LOUD	MOB	STOP	TSKS	DX
1	ACCOUNTANT	4	526	0	0	0	0	0	0	0	4	0	1.0	1.5	8	2999	0.8	0.0	0.0	0.0	0.0	0.0
2	ACCOUNTANT II	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
3	ADMINISTRATIVE ASSISTANT	1	800	0	0	0	0	0	0	1	0	0	3.0	2.0	1	0	1.0	0.0	0.0	100.0	0.0	0.3
4	ADMINISTRATIVE ASST	1	454	0	0	0	0	0	0	0	0	1	1.0	2.0	1	5445	1.0	0.0	0.0	100.0	0.0	0.3
5	ANALYST CONTROL I	1	500	0	1	0	0	0	0	0	0	0	1.0	3.0	6	1500	1.0	0.0	0.0	100.0	0.0	0.3
6	ANALYST CONTROL II	1	600	0	1	0	0	0	0	0	0	0	2.0	3.0	6	7200	1.0	0.0	0.0	0.0	0.0	0.0
7	ANALYST INV CTL	2	550	0	2	0	0	0	0	0	0	0	1.0	2.5	8	4350	1.0	0.0	100.0	100.0	50.0	0.6
8	ANALYST RESEARCH	1	793	0	0	0	0	0	0	0	1	0	3.0	2.0	3	9500	2.0	100.0	100.0	100.0	0.0	0.8
9	ANALYST RESEARCH OP	1	1250	0	1	0	0	0	0	0	0	0	4.0	2.0	1	7500	1.0	0.0	0.0	100.0	0.0	0.3
10	ANALYST RESEARCH OPERATIONS	1	1000	0	1	0	0	0	0	0	0	0	3.0	1.0	1	5000	1.0	100.0	0.0	100.0	0.0	0.5
11	ANALYST SYSTEMS	5	911	0	0	0	0	0	0	0	3	2	2.0	2.4	17	3439	1.6	20.0	0.0	40.0	20.0	0.2
12	ANALYST SYSTEMS CHIEF	1	667	0	0	0	0	0	0	0	0	1	3.0	1.0	1	0	2.0	0.0	0.0	0.0	100.0	0.3
13	ANALYST SYSTEMS I	2	896	0	1	0	0	0	0	0	1	0	1.0	2.0	5	4750	1.5	0.0	0.0	0.0	0.0	0.0
14	ANALYST SYSTEMS II	1	843	0	0	0	0	0	0	0	1	0	1.0	2.0	2	5058	1.0	0.0	0.0	0.0	0.0	0.0
15	ANALYST SYSTEMS III	1	950	0	0	0	0	0	0	0	1	0	1.0	1.0	1	5700	1.0	0.0	0.0	0.0	0.0	0.0
16	ANALYST SYSTEMS SR	6	1094	0	0	0	0	0	0	0	6	0	2.5	1.7	17	6624	1.2	33.3	16.7	66.7	16.7	0.3
17	ANALYST TECHNICIAN SR	1	1217	0	0	0	0	0	0	0	1	0	1.0	2.0	1	9999	1.0	100.0	100.0	0.0	0.0	0.5
18	ANALYST TRAFFIC	1	739	0	0	0	0	0	0	0	1	0	2.0	2.0	8	9999	1.0	0.0	0.0	100.0	0.0	0.3
19	ANALYST TRAFFIC SR	1	800	0	0	0	0	0	0	0	1	0	2.0	3.0	4	9999	1.0	100.0	100.0	0.0	0.0	0.5
20	AUDITOR	4	828	0	1	0	0	0	0	0	3	0	2.0	2.0	15	8399	1.5	0.0	25.0	0.0	0.0	0.1
21	AUDITOR JR	1	825	0	0	1	0	0	0	0	0	0	1.0	3.0	1	206	2.0	100.0	0.0	100.0	0.0	0.5
22	BOOKKEEPER	1	635	0	0	0	0	0	0	0	1	0	2.0	3.0	1	3800	1.0	0.0	0.0	0.0	0.0	0.0
23	CASHIER	1	690	0	0	0	0	0	0	0	1	0	1.0	3.0	1	8280	2.0	0.0	0.0	100.0	0.0	0.3
24	CLERK ACCOUNTING	1	405	0	0	0	0	0	1	0	0	0	1.0	1.0	3	405	1.0	0.0	0.0	0.0	0.0	0.0
25	CLERK ACCT II	1	327	0	0	0	0	0	0	0	1	0	1.0	3.0	1	164	1.0	0.0	0.0	100.0	0.0	0.3
26	CLERK ACCT III	1	460	0	0	0	0	0	0	0	1	0	1.0	3.0	1	230	1.0	0.0	0.0	100.0	0.0	0.3
27	CLERK CASHIER	1	560	0	0	0	0	0	0	0	1	0	1.0	3.0	2	6720	2.0	100.0	0.0	0.0	0.0	0.3
28	CLERK CODING	2	363	0	0	0	0	0	1	0	1	0	1.0	2.0	33	1228	1.0	0.0	0.0	50.0	50.0	0.3
29	CLERK CONTROL	2	400	0	0	0	0	1	0	0	1	0	1.5	2.5	3	200	0.5	0.0	0.0	50.0	0.0	0.1
30	CLERK CONTROL SET UP	1	450	0	0	0	0	1	0	0	0	0	1.0	0.0	6	0	0.0	0.0	0.0	0.0	0.0	0.0
31	CLERK COST	1	489	0	0	0	0	0	0	0	1	0	1.0	3.0	2	5868	2.0	0.0	0.0	0.0	0.0	0.0
32	CLERK DATA CONTROL	3	491	0	0	0	0	0	0	0	3	0	1.0	2.0	30	333	1.0	0.0	0.0	0.0	0.0	0.0
33	CLERK DP	1	575	0	0	1	0	0	0	0	0	0	1.0	3.0	6	1150	2.0	0.0	0.0	100.0	0.0	0.3
34	CLERK EDP CONTROL I	1	483	0	0	0	0	0	0	0	1	0	1.0	3.0	5	2000	2.0	0.0	100.0	0.0	0.0	0.3
35	CLERK FILE	1	620	0	0	0	0	1	0	0	0	0	1.0	0.0	3	0	0.0	0.0	0.0	100.0	0.0	0.3
36	CLERK I	1	375	0	0	0	0	0	0	0	1	0	1.0	2.0	3	375	2.0	0.0	0.0	0.0	0.0	0.0
37	CLERK INPUT OUTPUT	1	410	0	0	0	0	0	0	0	1	0	1.0	3.0	3	102	1.0	100.0	0.0	100.0	0.0	0.5
38	CLERK JR	4	620	0	0	4	0	0	0	0	0	0	1.0	3.0	8	196	2.0	0.0	0.0	75.0	0.0	0.2
39	CLERK MAIL	1	500	0	0	1	0	0	0	0	0	0	1.0	3.0	2	1000	2.0	0.0	0.0	0.0	0.0	0.0
40	CLERK PAYROLL	1	350	0	0	0	0	0	0	1	0	0	1.0	0.0	2	0	0.0	0.0	0.0	0.0	0.0	0.0
41	CLERK PRODUCTION RECORD	1	414	0	0	0	0	0	0	0	1	0	1.0	3.0	1	1242	2.0	100.0	0.0	100.0	0.0	0.5
42	CLERK RECORDS	1	414	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	100.0	0.0	100.0	0.0	0.5
43	CLERK SPECIAL	1	680	0	0	1	0	0	0	0	0	0	1.0	3.0	1	170	0.0	0.0	0.0	100.0	0.0	0.3
44	CLERK SR	1	800	0	0	1	0	0	0	0	0	0	1.0	1.0	1	9999	2.0	0.0	0.0	100.0	0.0	0.3
45	CLERK STATISTICAL	1	489	0	0	0	0	0	0	0	1	0	1.0	3.0	15	5865	1.0	0.0	0.0	0.0	0.0	0.0
46	CLERK STENO II	1	450	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
47	CLERK STOCK II	1	559	0	0	0	0	0	0	0	1	0	1.0	2.0	1	2000	2.0	0.0	0.0	0.0	0.0	0.0
48	CLERK TRAFFIC ACCIDENT	6	404	0	0	0	0	0	0	0	6	0	1.0	3.0	48	1385	0.7	0.0	0.0	0.0	0.0	0.0
49	CLERK TYPIST I	3	237	0	0	0	0	0	0	0	3	0	1.0	0.7	1	0	0.3	0.0	0.0	0.0	0.0	0.0
50	CLERK TYPIST II	3	294	0	0	0	0	0	0	0	3	0	1.0	1.0	3	250	0.7	33.3	33.3	66.7	0.0	0.3

TABLE I (CONTINUED)

JOB LIST ORDERED BY ALPHABET AND BY SALARY IN DATA PROCESSING

NO.	JOB TITLE	F	PAY	2	4	6	7	8	9	10	11	12	EDMN	HIRE	TOT	$TRN	ED-$	LOUD	MOB	STOP	TSKS	DX
51	CLERK TYPIST III	2	545	0	0	0	0	0	0	0	2	0	1.0	2.5	3	1557	1.5	50.0	0.0	100.0	0.0	0.4
52	CLERK VERIFICATION	1	540	0	0	0	0	0	0	0	1	0	1.0	3.0	2	1600	2.0	0.0	0.0	0.0	0.0	0.0
53	COORDINATOR	1	1157	0	0	0	0	0	0	0	1	0	3.0	2.0	1	9999	2.0	0.0	0.0	0.0	0.0	0.0
54	COORDINATOR ASST	1	502	0	0	0	0	0	0	0	1	0	2.0	0.0	10	10	0.0	0.0	0.0	0.0	0.0	0.0
55	COORDINATOR BILLING	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
56	COORDINATOR CONTROL CENTER	1	1000	0	0	0	0	0	0	0	1	0	1.0	2.0	1	0	0.0	0.0	0.0	100.0	0.0	0.3
57	COORDINATOR DP	3	826	0	0	1	0	0	0	0	2	0	1.7	1.7	2	1992	1.0	66.7	0.0	66.7	0.0	0.3
58	COORDINATOR DP ACCTG SERVICE	1	750	0	0	0	0	0	0	0	0	1	1.0	2.0	1	6750	1.0	0.0	0.0	0.0	0.0	0.0
59	COORDINATOR HOSPITAL DP	8	739	0	0	0	0	0	0	0	8	0	2.0	1.0	6	3405	0.8	62.5	12.5	87.5	25.0	0.5
60	COORDINATOR JOB STREAM	1	640	0	1	0	0	0	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	100.0	100.0	0.5
61	COORDINATOR NURSING COMPUTER	1	800	0	0	0	0	0	0	0	1	0	3.0	2.0	1	0	1.0	0.0	0.0	0.0	0.0	0.0
62	COORDINATOR PROGRAM	1	1100	0	0	0	0	0	0	0	1	0	3.0	2.0	0	0	0.0	100.0	0.0	100.0	0.0	0.5
63	DATA CHECKER	2	476	0	0	0	0	0	0	0	2	0	1.0	3.0	8	9999	1.0	0.0	0.0	50.0	0.0	0.1
64	DATA HANDLER	3	523	0	0	0	0	0	0	1	2	0	1.0	1.0	5	460	0.7	33.3	33.3	66.7	33.3	0.4
65	DATA MATERIAL HANDLER	1	460	0	0	0	0	0	0	1	0	0	1.0	2.0	1	1600	1.0	0.0	100.0	0.0	0.0	0.3
66	DESIGNER	4	1021	0	0	0	0	0	0	0	4	0	3.0	2.0	50	8882	2.0	25.0	0.0	0.0	0.0	0.1
67	DETAILER	1	750	0	0	0	0	0	0	0	1	0	2.0	3.0	12	9999	1.0	100.0	100.0	0.0	0.0	0.5
68	DETAILER SR	1	788	0	0	0	0	0	0	0	1	0	2.0	2.0	11	9999	1.0	0.0	0.0	0.0	0.0	0.0
69	DIRECTOR	1	1250	0	0	0	0	0	0	0	1	0	4.0	2.0	1	0	0.0	0.0	100.0	100.0	0.0	0.5
70	DIRECTOR ADM SYSTEMS	1	900	0	0	0	0	0	0	0	0	1	3.0	2.0	1	5400	1.0	0.0	0.0	100.0	0.0	0.3
71	DIRECTOR DP	2	1000	0	0	0	0	0	1	0	1	0	2.0	2.0	2	5999	1.5	50.0	0.0	50.0	0.0	0.3
72	ENCODER DATA	1	440	0	0	0	0	0	0	1	0	0	1.0	0.0	3	0	0.0	0.0	0.0	100.0	0.0	0.3
73	ENGINEER	6	989	0	0	0	0	0	0	0	6	0	3.2	2.2	36	8332	1.8	16.7	0.0	33.3	0.0	0.1
74	EXPEDITER	2	565	0	0	0	0	0	0	0	2	0	1.0	3.0	2	2000	2.0	0.0	0.0	0.0	0.0	0.0
75	GROUP LEADER	1	1158	0	0	0	0	0	0	0	1	0	3.0	2.0	5	9999	2.0	100.0	100.0	0.0	0.0	0.5
76	INSTRUCTOR	1	800	0	0	0	0	0	0	0	0	1	3.0	2.0	3	800	2.0	0.0	100.0	0.0	0.0	0.3
77	MANAGER	1	834	0	0	0	0	0	1	0	0	0	2.0	2.0	1	5004	1.0	0.0	0.0	0.0	0.0	0.0
78	MANAGER ADM SERVICES	1	545	0	0	0	0	0	0	0	0	1	2.0	2.0	1	6540	1.0	0.0	0.0	100.0	0.0	0.3
79	MANAGER DATA SERVICES	1	1400	0	1	0	0	0	0	0	0	0	3.0	2.0	1	8400	1.0	0.0	0.0	100.0	100.0	0.5
80	MANAGER DP	5	1190	0	0	1	0	0	1	0	3	0	2.4	2.2	5	5484	1.4	0.0	0.0	60.0	0.0	0.1
81	MANAGER FOOD SERVICE	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
82	MANAGER OFFICE	1	1025	0	0	0	0	0	0	0	1	0	3.0	3.0	1	2001	1.0	0.0	0.0	0.0	0.0	0.0
83	MANAGER OPERATIONS	4	494	0	1	0	0	1	0	0	2	0	2.0	0.8	2	0	0.3	25.0	25.0	25.0	25.0	0.3
84	MANAGER PROGRAMMING	1	1363	0	1	0	0	0	0	0	0	0	3.0	2.0	1	9999	1.0	100.0	0.0	0.0	0.0	0.3
85	MANAGER SOFTWARE SECTION	1	0	0	1	0	0	0	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
86	MANAGER SYSTEMS PROGRAMMING	1	1000	0	0	0	0	0	0	0	1	0	3.0	2.0	1	0	0.0	0.0	0.0	0.0	0.0	0.0
87	METER READER	1	0	0	0	1	0	0	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
88	NURSE GENERAL III	1	700	0	0	0	0	0	0	0	1	0	3.0	2.0	1	3150	1.0	100.0	100.0	100.0	100.0	1.0
89	OFFICER BUDGET CONTROL	1	1073	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	100.0	0.0	0.3
90	OPERATOR BURSTER	1	388	0	0	0	0	0	1	0	0	0	1.0	2.0	2	388	2.0	0.0	0.0	100.0	100.0	0.5
91	OPERATOR COMPUTER	31	635	1	1	1	0	4	6	3	10	5	1.2	2.0	92	2332	1.1	9.7	9.7	16.1	3.2	0.1
92	OPERATOR COMPUTER I	3	503	0	1	0	0	0	0	0	2	0	1.0	2.0	29	2538	1.0	33.3	0.0	66.7	33.3	0.3
93	OPERATOR COMPUTER II	3	610	0	1	0	0	0	1	0	1	0	1.0	1.3	6	2765	1.0	0.0	0.0	0.0	33.3	0.1
94	OPERATOR COMPUTER JR	1	525	0	0	0	0	0	1	0	0	0	1.0	2.0	15	4725	2.0	0.0	100.0	100.0	0.0	0.5
95	OPERATOR COMPUTER SR	2	520	0	0	0	0	0	0	0	0	2	1.0	2.0	8	5505	1.0	0.0	0.0	100.0	50.0	0.4
96	OPERATOR COMPUTER TRAINEE	1	550	0	0	0	0	1	0	0	0	0	1.0	0.0	0	0	0.0	0.0	100.0	0.0	0.0	0.3
97	OPERATOR CRT DATA ANALYST	1	605	0	0	0	0	1	0	0	0	0	1.0	0.0	16	0	0.0	0.0	0.0	100.0	0.0	0.3
98	OPERATOR DATA CONVERSION LEA	1	600	0	1	0	0	0	0	0	0	0	1.0	2.0	2	4000	2.0	0.0	0.0	100.0	0.0	0.3
99	OPERATOR DATA INPUT	1	440	0	1	0	0	0	0	0	0	0	1.0	2.0	70	11	0.0	100.0	0.0	0.0	0.0	0.3
100	OPERATOR DATA RECORDER	2	412	0	0	0	0	0	0	1	0	1	1.0	2.0	2	1900	1.0	0.0	50.0	50.0	0.0	0.3

TABLE I (CONTINUED)

JOB LIST ORDERED BY ALPHABET AND BY SALARY IN DATA PROCESSING

NO.	JOB TITLE	F	PAY	2	4	6	7	8	9	10	11	12	EDMN	HIRE	TOT	$TRN	ED-$	LOUD	MOB	STOP	TSKS	DX
101	OPERATOR DP	1	417	0	0	0	0	0	0	0	0	1	1.0	0.0	1	0	0.0	0.0	0.0	0.0	0.0	0.0
102	OPERATOR DP SR	1	458	0	0	0	0	0	0	0	0	1	1.0	0.0	1	0	0.0	0.0	0.0	0.0	0.0	0.0
103	OPERATOR EDP II	1	630	0	0	0	0	0	0	0	1	0	1.0	3.0	3	3780	2.0	100.0	0.0	100.0	0.0	0.5
104	OPERATOR ENCODER	1	400	0	0	0	0	0	1	0	0	0	1.0	2.0	1	200	1.0	0.0	0.0	0.0	0.0	0.0
105	OPERATOR EQUIPMENT DP	1	480	0	1	0	0	0	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
106	OPERATOR I DP	2	512	0	0	0	0	0	0	0	2	0	4.0	2.0	24	3072	2.0	0.0	0.0	0.0	0.0	0.0
107	OPERATOR KP	16	322	1	2	0	0	3	3	1	4	2	1.0	1.3	117	541	0.9	25.0	12.5	50.0	0.0	0.2
108	OPERATOR KP I	14	387	0	0	0	0	0	0	0	14	0	1.1	1.9	30	750	0.9	21.4	14.3	35.7	14.3	0.2
109	OPERATOR KP II	14	451	0	0	0	0	0	0	0	14	0	1.1	1.2	18	1142	0.8	21.4	21.4	28.6	21.4	0.2
110	OPERATOR KP LEAD	1	550	0	0	0	0	1	0	0	0	0	1.0	3.0	1	550	0.0	0.0	0.0	0.0	0.0	0.0
111	OPERATOR KP SR	4	515	0	0	1	0	0	0	0	2	1	1.0	1.0	12	896	0.5	0.0	0.0	25.0	25.0	0.1
112	OPERATOR MACHINE DP	1	520	0	1	0	0	0	0	0	0	0	1.0	3.0	2	450	2.0	0.0	0.0	100.0	100.0	0.5
113	OPERATOR MACHINE U RECORD	2	605	0	1	0	0	1	0	0	0	0	1.0	1.0	15	356	0.5	0.0	50.0	0.0	0.0	0.1
114	OPERATOR MASTER	1	800	0	1	0	0	0	0	0	0	0	1.0	1.0	5	9999	1.0	0.0	0.0	100.0	0.0	0.3
115	OPERATOR MTST MTSC	1	416	0	0	0	0	0	1	0	0	0	2.0	2.0	15	1248	1.0	0.0	0.0	100.0	0.0	0.3
116	OPERATOR TAB	5	469	0	0	1	0	1	3	0	0	0	1.0	2.4	17	1980	1.2	0.0	0.0	0.0	0.0	0.0
117	OPERATOR UTILITY	2	440	0	0	0	0	0	2	0	0	0	1.0	3.0	4	150	1.0	0.0	0.0	0.0	0.0	0.0
118	OPERATOR VERIFIER	2	250	0	0	0	0	2	0	0	0	0	1.0	1.0	3	250	1.0	0.0	0.0	0.0	0.0	0.0
119	PHYSICIAN GENERAL I	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
120	PHYSICIAN GENERAL III	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
121	PROCESSOR	1	389	0	0	0	0	0	1	0	0	0	1.0	2.0	50	2334	2.0	0.0	0.0	100.0	0.0	0.3
122	PROCESSOR PLANS	1	991	0	0	0	0	0	0	0	1	0	2.0	2.0	3	9999	2.0	0.0	0.0	0.0	0.0	0.0
123	PROGRAMMER	17	704	0	1	1	0	0	4	2	7	2	1.7	2.1	79	3777	1.1	23.5	23.5	29.4	5.9	0.2
124	PROGRAMMER ANALYST	10	814	0	1	0	0	0	0	0	5	4	1.7	1.3	23	3428	0.6	10.0	10.0	20.0	0.0	0.1
125	PROGRAMMER ENGNR	5	926	0	0	0	0	0	0	0	5	0	3.0	2.8	21	9789	1.0	40.0	40.0	40.0	40.0	0.4
126	PROGRAMMER I	6	581	0	0	0	0	0	0	0	6	0	1.0	2.7	34	3305	1.2	16.7	16.7	16.7	16.7	0.2
127	PROGRAMMER II	4	596	0	0	0	0	0	0	0	4	0	1.0	2.0	5	3491	1.3	50.0	25.0	50.0	25.0	0.4
128	PROGRAMMER III	1	954	0	0	0	0	0	0	0	1	0	1.0	2.0	1	9999	1.0	100.0	0.0	100.0	0.0	0.5
129	PROGRAMMER JR	1	585	0	0	0	0	0	0	0	1	0	1.0	2.0	4	1170	1.0	100.0	0.0	100.0	100.0	0.8
130	PROGRAMMER LEAD	1	750	0	0	0	0	0	0	1	0	0	1.0	0.0	6	0	0.0	0.0	0.0	0.0	100.0	0.3
131	PROGRAMMER OPERATOR	2	587	0	0	0	0	0	1	0	0	1	2.0	2.0	3	1256	2.0	0.0	0.0	50.0	50.0	0.3
132	PROGRAMMER SFTWRE ANLST CNSL	1	1100	0	1	0	0	0	0	0	0	0	3.0	1.0	6	6600	2.0	0.0	0.0	0.0	0.0	0.0
133	PROGRAMMER SYSTEMS	1	950	0	1	0	0	0	0	0	0	0	2.0	2.0	1	5000	1.0	100.0	0.0	0.0	0.0	0.3
134	PROGRAMMER TECHNICIAN II	1	1000	0	0	0	0	0	0	0	1	0	1.0	2.0	3	0	2.0	100.0	100.0	0.0	0.0	0.5
135	PROGRAMMER TRAINEE	1	545	0	0	0	0	0	0	0	1	0	1.0	3.0	1	3270	2.0	0.0	0.0	0.0	0.0	0.0
136	PSYCHIATRIC AIDE II	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
137	RECONCILIATOR PROOF	1	400	0	0	0	0	0	1	0	0	0	1.0	1.0	2	400	1.0	0.0	0.0	0.0	0.0	0.0
138	REPORTS CONTROL	1	600	0	1	0	0	0	0	0	0	0	1.0	2.0	1	1800	1.0	0.0	0.0	100.0	100.0	0.5
139	SCHEDULER JOB	1	760	0	1	0	0	0	0	0	0	0	1.0	1.0	1	9999	2.0	0.0	0.0	0.0	0.0	0.0
140	SCHEDULER OPERATIONS	2	698	0	1	0	0	0	0	0	1	0	1.0	1.5	2	2911	1.0	0.0	0.0	50.0	50.0	0.3
141	SECRETARY	4	458	0	0	0	0	0	2	0	1	1	1.0	1.8	54	500	0.5	25.0	0.0	50.0	0.0	0.2
142	SECRETARY ACCTG DATA CONTROL	1	288	0	0	0	0	0	0	0	0	1	4.0	1.0	20	9652	2.0	100.0	0.0	0.0	0.0	0.3
143	SECRETARY MTST MTSC	1	400	0	0	0	0	0	1	0	0	0	2.0	2.0	15	1200	1.0	0.0	0.0	100.0	100.0	0.5
144	SECRETARY OPERATOR KP	1	300	0	0	0	0	0	0	1	0	0	1.0	2.0	1	900	1.0	0.0	0.0	100.0	0.0	0.3
145	SECRETARY RECEPTIONIST	1	360	0	0	0	0	0	0	1	0	0	1.0	3.0	1	80	1.0	0.0	0.0	100.0	0.0	0.3
146	SECRETARY TRANS DATA CONTROL	1	375	0	0	0	0	0	0	0	0	1	1.0	3.0	1	1125	1.5	0.0	0.0	0.0	0.0	0.0
147	SECRETARY VERIFIER	1	0	0	0	0	0	0	0	0	0	1	2.0	3.0	1	0	2.0	100.0	0.0	100.0	100.0	0.8
148	STAGER	1	480	0	1	0	0	0	0	0	0	0	1.0	2.0	6	960	1.0	0.0	100.0	0.0	0.0	0.3
149	STATISTICIAN	2	618	0	0	0	0	0	0	0	2	0	1.5	2.5	21	4318	1.0	0.0	0.0	0.0	0.0	0.0
150	STENOGRAPHER SR	2	512	0	0	0	0	0	0	0	2	0	1.0	2.5	2	6150	1.5	50.0	0.0	50.0	50.0	0.4

TABLE I (CONTINUED)

JOB LIST ORDERED BY ALPHABET AND BY SALARY IN DATA PROCESSING

NO.	JOB TITLE	F	PAY	2	4	6	7	8	9	10	11	12	EDMN	HIRE	TOT	$TRN	ED-$	LOUD	MOB	STOP	TSKS	DX
151	STOCKMAN	1	0	0	0	0	0	1	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
152	SUPERVISOR	6	910	0	0	0	0	0	1	1	4	0	1.8	1.3	30	4491	1.0	0.0	0.0	16.7	0.0	0.0
153	SUPERVISOR DATA CONTROL	2	748	0	1	0	0	0	0	0	1	0	1.0	2.0	2	250	1.5	50.0	0.0	0.0	0.0	0.1
154	SUPERVISOR DATA PREPARATION	1	572	0	0	0	0	0	0	0	1	0	1.0	2.0	1	572	1.0	100.0	100.0	100.0	100.0	1.0
155	SUPERVISOR DP	4	822	0	0	1	0	0	0	1	2	0	2.8	2.3	4	6717	1.5	50.0	0.0	50.0	0.0	0.3
156	SUPERVISOR DP ASST	1	671	0	1	0	0	0	0	0	0	0	1.0	2.0	1	7500	2.0	0.0	0.0	0.0	100.0	0.3
157	SUPERVISOR DP SYSTEMS	1	834	0	0	0	0	0	1	0	0	0	1.0	2.0	1	9999	1.0	0.0	0.0	0.0	0.0	0.0
158	SUPERVISOR KP	5	334	0	1	0	0	1	0	0	3	0	1.0	1.4	3	2689	1.0	40.0	40.0	80.0	0.0	0.4
159	SUPERVISOR KP ASST	1	600	0	0	1	0	0	0	0	0	0	1.0	2.0	1	1200	2.0	100.0	0.0	100.0	0.0	0.5
160	SUPERVISOR KP I	1	1301	0	0	0	0	0	0	0	1	0	1.0	6.0	32	2000	0.0	0.0	0.0	0.0	0.0	0.0
161	SUPERVISOR OPERATIONS	8	582	0	1	0	0	0	1	1	4	1	1.0	1.6	9	2178	1.3	37.5	0.0	37.5	0.0	0.2
162	SUPERVISOR PROGRAMMING	3	583	0	0	0	0	0	1	0	2	0	2.3	1.7	3	8666	2.0	0.0	0.0	0.0	0.0	0.0
163	SUPERVISOR SECTION	1	800	0	1	0	0	0	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
164	SUPERVISOR SHIFT	3	702	0	0	0	0	0	0	0	1	2	1.3	1.7	5	3700	0.7	0.0	33.3	66.7	33.3	0.3
165	SUPERVISOR SHIFT ASST	1	0	0	0	0	0	0	0	1	0	0	1.0	2.0	2	0	1.0	0.0	0.0	0.0	0.0	0.0
166	SUPERVISOR SYSTEMS ANALYST	1	673	0	0	0	0	0	0	0	1	0	1.0	1.0	0	0	0.0	0.0	0.0	100.0	100.0	0.5
167	SUPERVISOR WPC	3	422	0	0	0	0	0	3	0	0	0	1.3	2.0	11	666	0.7	0.0	33.3	100.0	33.3	0.4
168	SYSTEMS DESIGNER	1	984	0	0	0	0	0	1	0	0	0	1.0	2.0	20	9999	1.0	100.0	100.0	100.0	0.0	0.8
169	TAPE ENCODER	1	440	0	0	0	0	0	0	1	0	0	1.0	0.0	2	0	0.0	0.0	0.0	0.0	0.0	0.0
170	TAPE LIBRARIAN	3	463	0	1	0	0	0	0	0	2	0	1.0	1.7	4	1535	1.3	33.3	0.0	33.3	33.3	0.2
171	TAPEWRITER	1	0	0	0	0	0	0	1	0	0	0	1.0	3.0	7	0	2.0	0.0	0.0	0.0	0.0	0.0
172	TEACHER	1	667	0	0	0	0	0	0	0	0	1	3.0	2.0	3	800	2.0	0.0	100.0	0.0	0.0	0.3
173	TECHNICAL WRITER	1	608	0	0	0	0	0	0	0	0	1	1.0	2.0	1	7300	1.0	100.0	100.0	0.0	0.0	0.5
174	TECHNICIAN DATA CONTROL	1	525	0	1	0	0	0	0	0	0	0	1.0	2.0	2	0	2.0	0.0	0.0	100.0	0.0	0.3
175	TECHNICIAN EDP I	1	507	0	0	0	0	0	0	0	1	0	1.0	2.0	3	2000	1.0	0.0	0.0	0.0	0.0	0.0
176	TECHNICIAN EDP II	1	587	0	0	0	0	0	0	0	1	0	1.0	2.0	3	2000	1.0	0.0	0.0	0.0	0.0	0.0
177	TECHNICIAN EDP III	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
178	TELECOM OPERATIONS SPLST	1	750	0	0	0	0	0	0	0	1	0	1.0	2.0	1	9999	2.0	0.0	0.0	0.0	0.0	0.0

respondents checking items at the bottom of Form DCP-3 (see Appendix A). The percentage is based on the number of respondents as shown in column F. Reading from left to right, the columnar data items in Table I may be interpreted:

(1) The job title "Accountant" appeared four times, the average pay reported by the four was $526 per month; all four were employed in installations classified under SIC code 11.

(2) Employers of accountants reported that the minimum education recommended for that job was 1.0 or high school; the hiring difficulty was 1.5 or between very difficult and difficult; that eight other employees carried the same job title; that bringing an accountant to an acceptable level of productivity after employment cost an estimated $2,999; and that appropriate education probably could have lowered this cost to the business.

(3) None of the accountants reported noise, crowding, interruptions, or extra tasks as efficiency-detractors, so the distraction index for that job title is 0.0.[1]

That the list was reduced from 400 to 178 indicated that over one-half of the total employee's titles had at least one identical match. (The exact frequency of matching titles is the first numeric item, column F.) The 178 titles represent 161 more than the number of data-processing occupations appearing in the Dictionary of Occupational Titles in July, 1969, as reported by the U. S. Office of Education and the U. S. Department of Labor.

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[1]Zeros in any table indicate no data reported.

Only four of the 178 titles were common to more than three Standard Industrial Classifications codes: Computer Operator, Keypunch Operator, Programmer, and Operations Supervisor. This appears to indicate a tendency of each type of business toward uniqueness of job titles, and that the matches were probably within the same SIC code.

Table II presents the same items encountered in Table I and may be read in the same manner. The contents were rearranged in ascending order by mean pay primarily to provide the structure for later processing; however, secondary benefits became visible in this type of sequential arrangement.

First, the minimum education recommended (not required) gradually increased as the mean pay increased. This may be seen by scanning down the entire columns headed "Pay" and "Edmn" in Table II. Most of the entries are 1.n (1.0 = high school) up to the $635 salary level appearing at line 110, page 50, Table II. From this point, both the pay and the education entries increase -- by page 51, Table II, the Edmn shows almost all 2.n (jr. college) or 3.n (degree) indications.

Tracing down the lengths of columns "Pay" and "Hire" and then "Pay" and "$trn" in the same manner will reveal apparent conditions in the related labor-market and possible education deficits. For instance, the hiring difficulty (see Figure 6) appeared to increase in tandem with the mean pay, especially from the $581 level (see line 91, Table II). A third item apparently rising along with mean pay is the business's cost of training the employee ($trn). This trend becomes noticeable from $690 on up (see line 118, Table II).

Considering Tables I and II together, probably the most significant element is that eight clusters of job titles centered in seven SIC codes

GENERAL: Unduplicated listing of job titles arranged in ascending pay order.
Columns F, 2 - 12, Tot, are totals; last five are percentages; remainder of numeric items are averages.
Zeros indicate no data reported**

Column	Contents
1	Line Number
2	Job Title
F	Frequency of title's appearance
PAY	Average salary for title; if calculated from raw data, base was always 40 hrs. weekly; 4 weeks per month; 12 months per year.
2 / . / . / . / 12	Standard Industrial Classification Codes: 2 = Mining 3 = Manufacturing 4 = Utilities 7 = Void in this study 8 = Retail trade 9 = Finance, Insurance, Real Estate 10 = Services 11 = Government--non educational 12 = Education
EDMN	Minimum Education Recommended by employer: 1 = high school 2 = jr. college 3 = degree 4 = other
HIRE	Hiring Difficulty indicated by employer: 1 = very difficult 2 = difficult 3 = no problem
TOT	Number of employees bearing same job title. **In case of 0, substitute 1.
$TRN	On-the-job training cost indicated by employer; field was set to 4 digits (dollars) and was keyed $9,999 in overflow situations.
ED-$	Employers' indication of whether or not education could have lowered the on-the-job cost: 1 = yes 2 = no
LOUD MOB STOP TSKS	Employees' indications of whether or not they felt that noise, crowding, interruptions, and extra tasks detracted from their efficiency.
DX	An average of the four previous columns.

Figure 7. Coding Legend and Reference for Table II

TABLE II

JOB LIST ORDERED BY ALPHABET AND BY SALARY IN DATA PROCESSING

NO.	JOB TITLE	F	PAY	2	4	6	7	8	9	10	11	12	EDMN	HIRE	TOT	$TRN	ED-$	LOUD	MOB	STOP	TSKS	DX
1	MANAGER SOFTWARE SECTION	1	0	0	1	0	0	0	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
2	METER READER	1	0	0	0	1	0	0	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
3	STOCKMAN	1	0	0	0	0	0	1	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
4	TAPEWRITER	1	0	0	0	0	0	0	1	0	0	0	1.0	3.0	7	0	2.0	0.0	0.0	0.0	0.0	0.0
5	SUPERVISOR SHIFT ASST	1	0	0	0	0	0	0	0	1	0	0	1.0	2.0	2	0	1.0	0.0	0.0	0.0	0.0	0.0
6	PHYSICIAN GENERAL III	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
7	PHYSICIAN GENERAL I	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
8	COORDINATOR BILLING	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
9	PSYCHIATRIC AIDE II	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
10	MANAGER FOOD SERVICE	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
11	ACCOUNTANT II	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
12	TECHNICIAN EDP III	1	0	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
13	SECRETARY VERIFIER	1	0	0	0	0	0	0	0	0	0	1	2.0	3.0	1	0	2.0	100.0	0.0	100.0	100.0	0.8
14	CLERK TYPIST I	3	237	0	0	0	0	0	0	0	3	0	1.0	0.7	1	0	0.3	0.0	0.0	0.0	0.0	0.0
15	OPERATOR VERIFIER	2	250	0	0	0	0	2	0	0	0	0	1.0	1.0	3	250	1.0	0.0	0.0	0.0	0.0	0.0
16	SECRETARY ACCTG DATA CONTROL	1	288	0	0	0	0	0	0	0	0	1	4.0	1.0	20	9652	2.0	100.0	0.0	0.0	0.0	0.3
17	CLERK TYPIST II	3	294	0	0	0	0	0	0	0	3	0	1.0	1.0	3	250	0.7	33.3	33.3	66.7	0.0	0.3
18	SECRETARY OPERATOR KP	1	300	0	0	0	0	0	0	1	0	0	1.0	2.0	1	900	1.0	0.0	0.0	100.0	0.0	0.3
19	OPERATOR KP	16	322	1	2	0	0	3	3	1	4	2	1.0	1.3	117	541	0.9	25.0	12.5	50.0	0.0	0.2
20	CLERK ACCT II	1	327	0	0	0	0	0	0	0	1	0	1.0	3.0	1	164	1.0	0.0	0.0	100.0	0.0	0.3
21	SUPERVISOR KP	5	334	0	1	0	0	1	0	0	3	0	1.0	1.4	3	2689	1.0	40.0	40.0	80.0	0.0	0.4
22	CLERK PAYROLL	1	350	0	0	0	0	0	0	1	0	0	1.0	0.0	2	0	0.0	0.0	0.0	0.0	0.0	0.0
23	SECRETARY RECEPTIONIST	1	360	0	0	0	0	0	0	1	0	0	1.0	3.0	1	80	1.0	0.0	0.0	100.0	0.0	0.3
24	CLERK CODING	2	363	0	0	0	0	0	1	0	1	0	1.0	2.0	33	1228	1.0	0.0	0.0	50.0	50.0	0.3
25	CLERK I	1	375	0	0	0	0	0	0	0	1	0	1.0	2.0	3	375	2.0	0.0	0.0	0.0	0.0	0.0
26	SECRETARY TRANS DATA CONTROL	1	375	0	0	0	0	0	0	0	0	1	1.0	3.0	1	1125	1.0	0.0	0.0	0.0	0.0	0.0
27	OPERATOR KP I	14	387	0	0	0	0	0	0	0	14	0	1.1	1.9	30	750	0.9	21.4	14.3	35.7	14.3	0.2
28	OPERATOR BURSTER	1	388	0	0	0	0	0	1	0	0	0	1.0	2.0	2	388	2.0	0.0	0.0	100.0	100.0	0.5
29	PROCESSOR	1	389	0	0	0	0	0	1	0	0	0	1.0	2.0	50	2334	2.0	0.0	0.0	100.0	0.0	0.3
30	CLERK CONTROL	2	400	0	0	0	0	1	0	0	1	0	1.5	2.5	3	200	0.5	0.0	0.0	50.0	0.0	0.1
31	RECONCILIATOR PROOF	1	400	0	0	0	0	0	1	0	0	0	1.0	1.0	2	400	1.0	0.0	0.0	0.0	0.0	0.0
32	OPERATOR ENCODER	1	400	0	0	0	0	0	1	0	0	0	1.0	2.0	1	200	1.0	0.0	0.0	0.0	0.0	0.0
33	SECRETARY MTST MTSC	1	400	0	0	0	0	0	1	0	0	0	2.0	2.0	15	1200	1.0	0.0	0.0	100.0	100.0	0.5
34	CLERK TRAFFIC ACCIDENT	6	404	0	0	0	0	0	0	0	6	0	1.0	3.0	48	1385	0.7	0.0	0.0	0.0	0.0	0.0
35	CLERK ACCOUNTING	1	405	0	0	0	0	0	1	0	0	0	1.0	1.0	3	405	1.0	0.0	0.0	0.0	0.0	0.0
36	CLERK INPUT OUTPUT	1	410	0	0	0	0	0	0	0	1	0	1.0	3.0	3	102	1.0	100.0	0.0	100.0	0.0	0.5
37	OPERATOR DATA RECORDER	2	412	0	0	0	0	0	0	1	0	1	1.0	2.0	2	1900	1.0	0.0	50.0	50.0	0.0	0.3
38	CLERK PRODUCTION RECORD	1	414	0	0	0	0	0	0	0	1	0	1.0	3.0	1	1242	2.0	100.0	0.0	100.0	0.0	0.5
39	CLERK RECORDS	1	414	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	100.0	0.0	100.0	0.0	0.5
40	OPERATOR MTST MTSC	1	416	0	0	0	0	0	1	0	0	0	2.0	2.0	15	1248	1.0	0.0	0.0	100.0	0.0	0.3
41	OPERATOR DP	1	417	0	0	0	0	0	0	0	0	1	1.0	0.0	1	0	0.0	0.0	0.0	0.0	0.0	0.0
42	SUPERVISOR WPC	3	422	0	0	0	0	0	3	0	0	0	1.3	2.0	11	666	0.7	0.0	33.3	100.0	33.3	0.4
43	OPERATOR DATA INPUT	1	440	0	1	0	0	0	0	0	0	0	1.0	2.0	70	11	0.0	100.0	0.0	0.0	0.0	0.3
44	OPERATOR UTILITY	2	440	0	0	0	0	0	2	0	0	0	1.0	3.0	4	150	1.0	0.0	0.0	0.0	0.0	0.0
45	ENCODER DATA	1	440	0	0	0	0	0	0	1	0	0	1.0	0.0	3	0	0.0	0.0	0.0	100.0	0.0	0.3
46	TAPE ENCODER	1	440	0	0	0	0	0	0	1	0	0	1.0	0.0	2	0	0.0	0.0	0.0	0.0	0.0	0.0
47	CLERK CONTROL SET UP	1	450	0	0	0	0	1	0	0	0	0	1.0	0.0	6	0	0.0	0.0	0.0	0.0	0.0	0.0
48	CLERK STENO II	1	450	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
49	OPERATOR KP II	14	451	0	0	0	0	0	0	0	14	0	1.1	1.2	18	1142	0.8	21.4	21.4	28.6	21.4	0.2
50	ADMINISTRATIVE ASST	1	454	0	0	0	0	0	0	0	0	1	1.0	2.0	1	5445	1.0	0.0	0.0	100.0	0.0	0.3

TABLE II (CONTINUED)

JOB LIST ORDERED BY ALPHABET AND BY SALARY IN DATA PROCESSING

NO.	JOB TITLE	F	PAY	2	4	6	7	8	9	10	11	12	EDMN	HIRE	TOT	$TRN	ED-$	LOUD	MOB	STOP	TSKS	DX
51	SECRETARY	4	458	0	0	0	0	0	2	0	1	1	1.0	1.8	54	500	0.5	25.0	0.0	50.0	0.0	0.2
52	OPERATOR DP SR	1	458	0	0	0	0	0	0	0	0	1	1.0	0.0	1	0	0.0	0.0	0.0	0.0	0.0	0.0
53	DATA MATERIAL HANDLER	1	460	0	0	0	0	0	0	1	0	0	1.0	2.0	1	1600	1.0	0.0	100.0	0.0	0.0	0.3
54	CLERK ACCT III	1	460	0	0	0	0	0	0	0	1	0	1.0	3.0	1	230	1.0	0.0	0.0	100.0	0.0	0.3
55	TAPE LIBRARIAN	3	463	0	1	0	0	0	0	0	2	0	1.0	1.7	4	1535	1.3	33.3	0.0	33.3	33.3	0.2
56	OPERATOR TAB	5	469	0	0	1	0	1	3	0	0	0	1.0	2.4	17	1980	1.2	0.0	0.0	0.0	0.0	0.0
57	DATA CHECKER	2	476	0	0	0	0	0	0	0	2	0	1.0	3.0	8	9999	1.0	0.0	0.0	50.0	0.0	0.1
58	STAGER	1	480	0	1	0	0	0	0	0	0	0	1.0	2.0	6	960	1.0	0.0	100.0	0.0	0.0	0.3
59	OPERATOR EQUIPMENT DP	1	480	0	1	0	0	0	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
60	CLERK EDP CONTROL I	1	483	0	0	0	0	0	0	0	1	0	1.0	3.0	5	2000	2.0	0.0	100.0	0.0	0.0	0.3
61	CLERK COST	1	489	0	0	0	0	0	0	0	1	0	1.0	3.0	2	5868	2.0	0.0	0.0	0.0	0.0	0.0
62	CLERK STATISTICAL	1	489	0	0	0	0	0	0	0	1	0	1.0	3.0	15	5880	1.0	0.0	0.0	0.0	0.0	0.0
63	CLERK DATA CONTROL	3	491	0	0	0	0	0	0	0	3	0	1.0	2.0	30	333	1.0	0.0	0.0	0.0	0.0	0.0
64	MANAGER OPERATIONS	4	494	0	1	0	0	1	0	0	2	0	2.0	0.8	2	0	0.3	25.0	25.0	25.0	25.0	0.3
65	ANALYST CONTROL I	1	500	0	1	0	0	0	0	0	0	0	1.0	3.0	6	1500	1.0	0.0	0.0	100.0	0.0	0.3
66	CLERK MAIL	1	500	0	0	1	0	0	0	0	0	0	1.0	3.0	2	1000	2.0	0.0	0.0	0.0	0.0	0.0
67	COORDINATOR ASST	1	502	0	0	0	0	0	0	0	1	0	2.0	0.0	10	10	0.0	0.0	0.0	0.0	0.0	0.0
68	OPERATOR COMPUTER I	3	503	0	1	0	0	0	0	0	2	0	1.0	2.0	29	2538	1.0	33.3	0.0	66.7	33.3	0.3
69	TECHNICIAN EDP I	1	507	0	0	0	0	0	0	0	1	0	1.0	2.0	3	2000	1.0	0.0	0.0	0.0	0.0	0.0
70	OPERATOR I DP	2	512	0	0	0	0	0	0	0	2	0	4.0	2.0	24	3072	2.0	0.0	0.0	0.0	0.0	0.0
71	STENOGRAPHER SR	2	512	0	0	0	0	0	0	0	2	0	1.0	2.5	2	6150	1.5	50.0	0.0	50.0	50.0	0.4
72	OPERATOR KP SR	4	515	0	0	1	0	0	0	0	2	1	1.0	1.0	12	896	0.5	0.0	0.0	25.0	25.0	0.1
73	OPERATOR MACHINE DP	1	520	0	1	0	0	0	0	0	0	0	1.0	3.0	2	450	2.0	0.0	0.0	100.0	100.0	0.5
74	OPERATOR COMPUTER SR	2	520	0	0	0	0	0	0	0	0	2	1.0	2.0	8	5505	1.0	0.0	0.0	100.0	50.0	0.4
75	DATA HANDLER	3	523	0	0	0	0	0	0	1	2	0	1.0	1.0	5	460	0.7	33.3	33.3	66.7	33.3	0.4
76	TECHNICIAN DATA CONTROL	1	525	0	1	0	0	0	0	0	0	0	1.0	2.0	2	0	2.0	0.0	0.0	100.0	0.0	0.3
77	OPERATOR COMPUTER JR	1	525	0	0	0	0	0	1	0	0	0	1.0	2.0	15	4725	2.0	0.0	100.0	100.0	0.0	0.5
78	ACCOUNTANT	4	526	0	0	0	0	0	0	0	4	0	1.0	1.5	8	2999	0.8	0.0	0.0	0.0	0.0	0.0
79	CLERK VERIFICATION	1	540	0	0	0	0	0	0	0	1	0	1.0	3.0	2	1600	2.0	0.0	0.0	0.0	0.0	0.0
80	PROGRAMMER TRAINEE	1	545	0	0	0	0	0	0	0	1	0	1.0	3.0	1	3270	2.0	0.0	0.0	0.0	0.0	0.0
81	MANAGER ADM SERVICES	1	545	0	0	0	0	0	0	0	0	1	2.0	2.0	1	6540	1.0	0.0	0.0	100.0	0.0	0.3
82	CLERK TYPIST III	2	545	0	0	0	0	0	0	0	2	0	1.0	2.5	3	1557	1.5	50.0	0.0	100.0	0.0	0.4
83	ANALYST INV CTL	2	550	0	2	0	0	0	0	0	0	0	1.0	2.5	8	4350	1.0	0.0	100.0	100.0	50.0	0.6
84	OPERATOR COMPUTER TRAINEE	1	550	0	0	0	0	1	0	0	0	0	1.0	0.0	0	0	0.0	0.0	100.0	0.0	0.0	0.3
85	OPERATOR KP LEAD	1	550	0	0	0	0	1	0	0	0	0	1.0	3.0	1	550	0.0	0.0	0.0	0.0	0.0	0.0
86	CLERK STOCK II	1	559	0	0	0	0	0	0	0	1	0	1.0	2.0	1	2000	2.0	0.0	0.0	0.0	0.0	0.0
87	CLERK CASHIER	1	560	0	0	0	0	0	0	0	1	0	1.0	3.0	2	6720	2.0	100.0	0.0	0.0	0.0	0.3
88	EXPEDITER	2	565	0	0	0	0	0	0	0	2	0	1.0	3.0	2	2000	2.0	0.0	0.0	0.0	0.0	0.0
89	SUPERVISOR DATA PREPARATION	1	572	0	0	0	0	0	0	0	1	0	1.0	2.0	1	572	1.0	100.0	100.0	100.0	100.0	1.0
90	CLERK DP	1	575	0	0	1	0	0	0	0	0	0	1.0	3.0	6	1150	2.0	0.0	0.0	100.0	0.0	0.3
91	PROGRAMMER I	6	581	0	0	0	0	0	0	0	6	0	1.0	2.7	34	3305	1.2	16.7	16.7	16.7	16.7	0.2
92	SUPERVISOR OPERATIONS	8	582	0	1	0	0	0	1	1	4	1	1.0	1.6	9	2178	1.3	37.5	0.0	37.5	0.0	0.2
93	SUPERVISOR PROGRAMMING	3	583	0	0	0	0	0	1	0	2	0	2.3	1.7	3	8666	2.0	0.0	0.0	0.0	0.0	0.0
94	PROGRAMMER JR	1	585	0	0	0	0	0	0	0	1	0	1.0	2.0	4	1170	1.0	100.0	0.0	100.0	100.0	0.8
95	TECHNICIAN EDP II	1	587	0	0	0	0	0	0	0	1	0	1.0	2.0	3	2000	1.0	0.0	0.0	0.0	0.0	0.0
96	PROGRAMMER OPERATOR	2	587	0	0	0	0	0	1	0	0	1	2.0	2.0	3	1256	2.0	0.0	0.0	50.0	50.0	0.3
97	PROGRAMMER II	4	596	0	0	0	0	0	0	0	4	0	1.0	2.0	5	3491	1.3	50.0	25.0	50.0	25.0	0.4
98	REPORTS CONTROL	1	600	0	1	0	0	0	0	0	0	0	1.0	2.0	1	1800	1.0	0.0	0.0	100.0	100.0	0.5
99	OPERATOR DATA CONVERSION LEA	1	600	0	1	0	0	0	0	0	0	0	1.0	2.0	2	4000	2.0	0.0	0.0	100.0	0.0	0.3
100	ANALYST CONTROL II	1	600	0	1	0	0	0	0	0	0	0	2.0	3.0	6	7200	1.0	0.0	0.0	0.0	0.0	0.0

TABLE II (CONTINUED)

JOB LIST ORDERED BY ALPHABET AND BY SALARY IN DATA PROCESSING

NO.	JOB TITLE	F	PAY	2	4	6	7	8	9	10	11	12	EDMN	HIRE	TOT	$TRN	ED-$	LOUD	MOB	STOP	TSKS	DX
101	SUPERVISOR KP ASST	1	600	0	0	1	0	0	0	0	0	0	1.0	2.0	1	1200	2.0	100.0	0.0	100.0	0.0	0.5
102	OPERATOR MACHINE U RECORD	2	605	0	1	0	0	1	0	0	0	0	1.0	1.0	15	356	0.5	0.0	50.0	0.0	0.0	0.1
103	OPERATOR CRT DATA ANALYST	1	605	0	0	0	0	1	0	0	0	0	1.0	0.0	16	0	0.0	0.0	0.0	100.0	0.0	0.3
104	TECHNICAL WRITER	1	608	0	0	0	0	0	0	0	0	1	1.0	2.0	1	7300	1.0	100.0	100.0	0.0	0.0	0.5
105	OPERATOR COMPUTER II	3	610	0	1	0	0	0	1	0	1	0	1.0	1.3	6	2765	1.0	0.0	0.0	0.0	33.3	0.1
106	STATISTICIAN	2	618	0	0	0	0	0	0	0	2	0	1.5	2.5	21	4318	1.0	0.0	0.0	0.0	0.0	0.0
107	CLERK JR	4	620	0	0	4	0	0	0	0	0	0	1.0	3.0	8	196	2.0	0.0	0.0	75.0	0.0	0.2
108	CLERK FILE	1	620	0	0	0	0	1	0	0	0	0	1.0	0.0	3	0	0.0	0.0	0.0	100.0	0.0	0.3
109	OPERATOR EDP II	1	630	0	0	0	0	0	0	0	1	0	1.0	3.0	3	3780	2.0	100.0	0.0	100.0	0.0	0.5
110	BOOKKEEPER	1	635	0	0	0	0	0	0	0	1	0	2.0	3.0	1	3800	1.0	0.0	0.0	0.0	0.0	0.0
111	OPERATOR COMPUTER	31	635	1	1	1	0	4	6	3	10	5	1.2	2.0	92	2332	1.1	9.7	9.7	16.1	3.2	0.1
112	COORDINATOR JOB STREAM	1	640	0	1	0	0	0	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	100.0	100.0	0.5
113	ANALYST SYSTEMS CHIEF	1	667	0	0	0	0	0	0	0	0	1	3.0	1.0	1	0	2.0	0.0	0.0	0.0	100.0	0.3
114	TEACHER	1	667	0	0	0	0	0	0	0	0	1	3.0	2.0	3	800	2.0	0.0	100.0	0.0	0.0	0.3
115	SUPERVISOR DP ASST	1	671	0	1	0	0	0	0	0	0	0	1.0	2.0	1	7500	2.0	0.0	0.0	0.0	100.0	0.3
116	SUPERVISOR SYSTEMS ANALYST	1	673	0	0	0	0	0	0	0	1	0	1.0	1.0	0	0	0.0	0.0	0.0	100.0	100.0	0.5
117	CLERK SPECIAL	1	680	0	0	1	0	0	0	0	0	0	1.0	3.0	1	170	2.0	0.0	0.0	100.0	0.0	0.3
118	CASHIER	1	690	0	0	0	0	0	0	0	1	0	1.0	3.0	1	8280	2.0	0.0	0.0	100.0	0.0	0.3
119	SCHEDULER OPERATIONS	2	698	0	1	0	0	0	0	0	1	0	1.0	1.5	2	2911	1.0	0.0	0.0	50.0	50.0	0.3
120	NURSE GENERAL III	1	700	0	0	0	0	0	0	0	1	0	3.0	2.0	1	3150	1.0	100.0	100.0	100.0	100.0	1.0
121	SUPERVISOR SHIFT	3	702	0	0	0	0	0	0	0	1	2	1.3	1.7	5	3700	0.7	0.0	33.3	66.7	33.3	0.3
122	PROGRAMMER	17	704	0	1	1	0	0	4	2	7	2	1.7	2.1	79	3777	1.1	23.5	23.5	29.4	5.9	0.2
123	COORDINATOR HOSPITAL DP	8	739	0	0	0	0	0	0	0	8	0	2.0	1.0	6	3405	0.8	62.5	12.5	87.5	25.0	0.5
124	ANALYST TRAFFIC	1	739	0	0	0	0	0	0	0	1	0	2.0	2.0	8	9999	1.0	0.0	0.0	100.0	0.0	0.3
125	SUPERVISOR DATA CONTROL	2	748	0	1	0	0	0	0	0	1	0	1.0	2.0	2	250	1.5	50.0	0.0	0.0	0.0	0.1
126	PROGRAMMER LEAD	1	750	0	0	0	0	0	0	1	0	0	1.0	0.0	6	0	0.0	0.0	0.0	0.0	100.0	0.3
127	DETAILER	1	750	0	0	0	0	0	0	0	1	0	2.0	3.0	12	9999	1.0	100.0	100.0	0.0	0.0	0.5
128	TELECOM OPERATIONS SPLST	1	750	0	0	0	0	0	0	0	1	0	1.0	2.0	1	9999	2.0	0.0	0.0	0.0	0.0	0.0
129	COORDINATOR DP ACCTG SERVICE	1	750	0	0	0	0	0	0	0	0	1	1.0	2.0	1	6750	1.0	0.0	0.0	0.0	0.0	0.0
130	SCHEDULER JOB	1	760	0	1	0	0	0	0	0	0	0	1.0	1.0	1	9999	2.0	0.0	0.0	0.0	0.0	0.0
131	DETAILER SR	1	788	0	0	0	0	0	0	0	1	0	2.0	2.0	11	9999	1.0	0.0	0.0	0.0	0.0	0.0
132	ANALYST RESEARCH	1	793	0	0	0	0	0	0	0	1	0	3.0	2.0	3	9500	2.0	100.0	100.0	100.0	0.0	0.8
133	SUPERVISOR SECTION	1	800	0	1	0	0	0	0	0	0	0	1.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
134	OPERATOR MASTER	1	800	0	1	0	0	0	0	0	0	0	1.0	1.0	5	9999	1.0	0.0	0.0	100.0	0.0	0.3
135	CLERK SR	1	800	0	0	1	0	0	0	0	0	0	1.0	1.0	1	9999	2.0	0.0	0.0	100.0	0.0	0.3
136	ADMINISTRATIVE ASSISTANT	1	800	0	0	0	0	0	0	1	0	0	3.0	2.0	1	0	1.0	0.0	0.0	100.0	0.0	0.3
137	COORDINATOR NURSING COMPUTER	1	800	0	0	0	0	0	0	0	1	0	3.0	2.0	1	0	1.0	0.0	0.0	0.0	0.0	0.0
138	ANALYST TRAFFIC SR	1	800	0	0	0	0	0	0	0	1	0	2.0	3.0	4	9999	1.0	100.0	100.0	0.0	0.0	0.5
139	INSTRUCTOR	1	800	0	0	0	0	0	0	0	0	1	3.0	2.0	3	800	2.0	0.0	100.0	0.0	0.0	0.3
140	PROGRAMMER ANALYST	10	814	0	1	0	0	0	0	0	5	4	1.7	1.3	23	3428	0.6	10.0	10.0	20.0	0.0	0.1
141	SUPERVISOR DP	4	822	0	0	1	0	0	0	1	2	0	2.8	2.3	4	6717	1.5	50.0	0.0	50.0	0.0	0.3
142	AUDITOR JR	1	825	0	0	1	0	0	0	0	0	0	1.0	3.0	1	206	2.0	100.0	0.0	100.0	0.0	0.5
143	COORDINATOR DP	3	826	0	0	1	0	0	0	0	2	0	1.7	1.7	2	1992	1.0	66.7	0.0	66.7	0.0	0.3
144	AUDITOR	4	828	0	1	0	0	0	0	0	3	0	2.0	2.0	15	8399	1.5	0.0	25.0	0.0	0.0	0.1
145	MANAGER	1	834	0	0	0	0	0	1	0	0	0	2.0	2.0	1	5004	1.0	0.0	0.0	0.0	0.0	0.0
146	SUPERVISOR DP SYSTEMS	1	834	0	0	0	0	0	1	0	0	0	1.0	2.0	1	9999	1.0	0.0	0.0	0.0	0.0	0.0
147	ANALYST SYSTEMS II	1	843	0	0	0	0	0	0	0	1	0	1.0	2.0	2	5056	1.0	0.0	0.0	0.0	0.0	0.0
148	ANALYST SYSTEMS 1	2	896	0	1	0	0	0	0	0	1	0	1.0	2.0	5	4750	1.5	0.0	0.0	0.0	0.0	0.0
149	DIRECTOR ADM SYSTEMS	1	900	0	0	0	0	0	0	0	0	1	3.0	2.0	1	5400	1.0	0.0	0.0	100.0	0.0	0.3
150	SUPERVISOR	6	910	0	0	0	0	0	1	1	4	0	1.8	1.3	30	4491	1.0	0.0	0.0	16.7	0.0	0.0

TABLE II (CONTINUED)

JOB LIST ORDERED BY ALPHABET AND BY SALARY IN DATA PROCESSING

NO.	JOB TITLE	F	PAY	2	4	6	7	8	9	10	11	12	EDMN	HIRE	TOT	$TRN	ED-$	LOUD	MOB	STOP	TSKS	DX
151	ANALYST SYSTEMS	5	911	0	0	0	0	0	0	0	3	2	2.0	2.4	17	3439	1.6	20.0	0.0	40.0	20.0	0.2
152	PROGRAMMER ENGNR	5	926	0	0	0	0	0	0	0	5	0	3.0	2.8	21	9789	1.0	40.0	40.0	40.0	40.0	0.4
153	PROGRAMMER SYSTEMS	1	950	0	1	0	0	0	0	0	0	0	2.0	2.0	1	5000	1.0	100.0	0.0	0.0	0.0	0.3
154	ANALYST SYSTEMS III	1	950	0	0	0	0	0	0	0	1	0	1.0	1.0	1	5700	1.0	0.0	0.0	0.0	0.0	0.0
155	PROGRAMMER III	1	954	0	0	0	0	0	0	0	1	0	1.0	2.0	1	9999	1.0	100.0	0.0	100.0	0.0	0.5
156	SYSTEMS DESIGNER	1	984	0	0	0	0	0	1	0	0	0	1.0	2.0	20	9999	1.0	100.0	100.0	100.0	0.0	0.8
157	ENGINEER	6	989	0	0	0	0	0	0	0	6	0	3.2	2.2	36	8332	1.8	16.7	0.0	33.3	0.0	0.1
158	PROCESSOR PLANS	1	991	0	0	0	0	0	0	0	1	0	2.0	2.0	3	9999	2.0	0.0	0.0	0.0	0.0	0.0
159	ANALYST RESEARCH OPERATIONS	1	1000	0	1	0	0	0	0	0	0	0	3.0	1.0	1	5000	1.0	100.0	0.0	100.0	0.0	0.5
160	DIRECTOR DP	2	1000	0	0	0	0	0	1	0	1	0	2.0	2.0	2	5999	1.5	50.0	0.0	50.0	0.0	0.3
161	MANAGER SYSTEMS PROGRAMMING	1	1000	0	0	0	0	0	0	0	1	0	3.0	2.0	1	0	0.0	0.0	0.0	0.0	0.0	0.0
162	COORDINATOR CONTROL CENTER	1	1000	0	0	0	0	0	0	0	1	0	1.0	2.0	1	0	0.0	0.0	0.0	100.0	0.0	0.3
163	PROGRAMMER TECHNICIAN II	1	1000	0	0	0	0	0	0	0	1	0	1.0	2.0	3	0	2.0	100.0	100.0	0.0	0.0	0.5
164	DESIGNER	4	1021	0	0	0	0	0	0	0	4	0	3.0	2.0	50	8882	2.0	25.0	0.0	0.0	0.0	0.1
165	MANAGER OFFICE	1	1025	0	0	0	0	0	0	0	1	0	3.0	3.0	1	2001	1.0	0.0	0.0	0.0	0.0	0.0
166	OFFICER BUDGET CONTROL	1	1073	0	0	0	0	0	0	0	1	0	1.0	0.0	0	0	0.0	0.0	0.0	100.0	0.0	0.3
167	ANALYST SYSTEMS SR	6	1094	0	0	0	0	0	0	0	6	0	2.5	1.7	17	6624	1.2	33.3	16.7	66.7	16.7	0.3
168	PROGRAMMER SFTWRE ANLST CNSL	1	1100	0	1	0	0	0	0	0	0	0	3.0	1.0	6	6600	2.0	0.0	0.0	0.0	0.0	0.0
169	COORDINATOR PROGRAM	1	1100	0	0	0	0	0	0	0	1	0	3.0	2.0	0	0	0.0	100.0	0.0	100.0	0.0	0.5
170	COORDINATOR	1	1157	0	0	0	0	0	0	0	1	0	3.0	2.0	1	9999	2.0	0.0	0.0	0.0	0.0	0.0
171	GROUP LEADER	1	1158	0	0	0	0	0	0	0	1	0	3.0	2.0	5	9999	2.0	100.0	100.0	0.0	0.0	0.5
172	MANAGER DP	5	1190	0	0	1	0	0	1	0	3	0	2.4	2.2	5	5484	1.4	0.0	0.0	60.0	0.0	0.1
173	ANALYST TECHNICIAN SR	1	1217	0	0	0	0	0	0	0	1	0	1.0	2.0	1	9999	1.0	100.0	100.0	0.0	0.0	0.5
174	ANALYST RESEARCH DP	1	1250	0	1	0	0	0	0	0	0	0	4.0	2.0	1	7500	1.0	0.0	0.0	100.0	0.0	0.3
175	DIRECTOR	1	1250	0	0	0	0	0	0	0	1	0	4.0	2.0	1	0	0.0	0.0	100.0	100.0	0.0	0.5
176	SUPERVISOR KP I	1	1301	0	0	0	0	0	0	0	1	0	1.0	6.0	32	2000	0.0	0.0	0.0	0.0	0.0	0.0
177	MANAGER PROGRAMMING	1	1363	0	1	0	0	0	0	0	0	0	3.0	2.0	1	9999	1.0	100.0	0.0	0.0	0.0	0.3
178	MANAGER DATA SERVICES	1	1400	0	1	0	0	0	0	0	0	0	3.0	2.0	1	8400	1.0	0.0	0.0	100.0	100.0	0.5

seem identifiable: Analysts, Clerks, Secretaries, Coordinators, Managers and Directors, Operators, Programmers, and Supervisors. In Vocational Education and Occupations (July, 1969, pp. 61-63), the U. S. Office of Education lists instructional programs for seven data-processing occupations. The titles most similar to ones identified in Table I are systems analysts, computer and keypunch operators and programmers. Both the analyst and the operator groups identified in this study seem to resist or surpass the qualifiers "systems", "computer", and "keypunch" for, apparently, several additional types of analysts and operators were identified. Lines 5 - 19 of Table I show 15 analyst titles representing a work force of 81 analysts (add the "tot" column). Lines 90 - 118 of the same table identify 29 different operators representing over 200 employees with the same titles.

In light of these findings, typical questions arising are: (1) Would, then, instructional programs directed toward training for a specific occupational title be adequate? (2) Even if an employee trained for the most common title in the group, what about horizontal or vertical mobility? (3) Is the similarity in title only, or is the work performed also similar?

One purpose of this study was to identify the titles of data-control personnel; they have been presented as identified. Considering these findings in relation to data nationally available may well raise questions not unlike those just stated. It would surely cultivate the idea that considering job titles without their related tasks would be of limited application.

Purpose Number Two

To identify tasks performed by data-control personnel.

Table III identifies 458 different tasks performed by this study's respondents and presents five related data items. Columns two and three are computed means (Popham, 1967, p. 12); data in the other columns represents accumulated frequencies for each task.

Column one represents a combination of two types of frequencies: (1) If an employee listed multiple performances of the same task, the task card was coded with the number of performances which was added into column one. (2) During computer processing, a count was kept of the number of alphabetically identical tasks encountered in the data deck and this count was also included in column one's total. If this is not kept in mind it might be assumed, mistakenly, that task 69, for example, was performed by each of the 400 respondents and more than once by some. In fact, that particular task was reported by 66 employees (20 + 36 + 10) obviously with multiple performances reported by some of these 66.

The table may be further interpreted as in this sample reading of task 21: an employee activity coded as "assign work" was reported and performed 113 times; its mean performance frequency was 3.4 indicating that it was done more often than weekly (4.0) but not quite as often as daily (3.0); it was considered as being halfway between vital (1.0) and necessary (2.0) to the job; 35 respondents listed the task as part of their jobs; 20 included the task and had also performed it the day before the survey; and 9 did not record the task in the job overview (Form DCP-2) but said that they had performed such a task the day before the survey.

GENERAL: Alphabetic, unduplicated list of tasks.
Zeros indicate no data reported.

Column Contents

1.....Task number

2.....Task title

Numeric data items:

1.....Total of (1) number of times the task appeared in the study and/or (2) performance frequency indicated as multiple performances of same task by an employee.

2.....Average time frame-of-reference indicating how often task was performed:

1 = continuous	5 = monthly
2 = hourly	6 = yearly
3 = daily	7 = as required
4 = weekly	

3.....Average of employee's perceptions of task's importance to job:

1 = vital
2 = necessary
3 = extra task

4.....Total number of employees reporting task on DCP-2.

5.....Total number of employees reporting task on DCP-2 and DCP-3.

6.....Total number of employees reporting task on DCP-3.

Figure 8. Coding Legend and Reference for Table III

TABLE III

TASK LIST WITH TOTALS AND MEANS OF RANGE, FREQUENCY, AND IMPORTANCE.

1	ADJUST INVENTORY	1	3.0	1.0	0	1	0	2	ADJUST PRIORITIES	16	3.0	1.0	0	1	0
3	ADMINISTER TEST	2	0.0	0.0	0	0	1	4	ANALYZE OUTPUT	16	3.5	1.5	2	6	1
5	ANALYZE PROBLEMS	5	3.5	1.5	2	0	2	6	ANALYZE PROGRAMS	6	3.7	1.3	2	1	1
7	ANALYZE SYSTEMS	19	3.1	1.3	9	6	1	8	ANALYZING	22	3.0	1.3	13	8	1
9	ANSWER QUESTIONS	112	2.8	1.5	10	11	7	10	ANSWER USER QUESTIONS	37	3.2	1.8	1	5	3
11	ANSWERING SERVICE	4	2.3	2.3	3	0	0	12	APPOINT COMMITTEES	2	4.0	3.0	1	0	0
13	APPROVE DOCUMENTATION	7	3.4	1.2	4	1	0	14	APPROVE MAINTENANCE	2	4.0	2.0	1	0	0
15	APPROVE ORDERS	3	2.8	1.8	1	3	1	16	APPROVE PAYMENTS	12	3.6	1.8	5	0	1
17	APPROVE PROGRAMS	11	2.3	1.0	0	3	0	18	APPROVE SYSTEMS	2	3.0	2.0	0	0	1
19	ARRANGE TRAVEL	3	4.0	2.0	0	1	2	20	ASSIGN USER ACCOUNTS	1	3.0	1.0	0	1	0
21	ASSIGN WORK	113	3.4	1.5	35	20	9	22	ASSIST ANALYSTS	8	3.8	1.8	2	2	0
23	ASSIST ENGINEERING	12	6.0	3.0	1	0	0	24	ASSIST MANAGEMENT	1	3.0	1.0	0	1	0
25	ASSIST OPERATORS	7	3.8	2.2	4	2	2	26	ASSIST PROGRAMMERS	49	3.2	1.6	19	7	4
27	ASSIST SUPERVISORS	6	3.3	2.3	2	2	1	28	ASSIST USERS	68	2.9	1.6	10	5	5
29	ATTEND CLASSES	2	0.0	0.0	0	0	1	30	ATTEND CLASS	2	0.0	0.0	0	0	1
31	ATTEND MEETING	103	4.0	1.6	26	15	18	32	ATTEND SEMINAR	5	5.2	1.6	4	1	0
33	AUTHORIZE PAYMENTS	2	0.0	0.0	0	0	1	34	BALANCE INPUT DATA	7	3.3	1.1	5	7	1
35	BALANCE OUTPUT	7	4.0	1.3	2	1	2	36	BALANCE REPORTS	59	3.7	1.7	13	11	9
37	BATCH FORMS	12	3.3	1.3	3	0	1	38	BIND BOOKS	2	3.0	1.0	1	0	0
39	BIND OUTPUT	2	2.0	2.0	1	1	0	40	BOX CARDS	3	3.0	1.3	2	1	0
41	BOX FORMS	2	3.0	2.0	1	0	0	42	BROADCAST MESSAGES	7	3.0	1.0	0	1	0
43	BUILD BACK UP	6	3.7	1.5	3	3	0	44	BUNDLE STUBS	1	3.0	2.0	0	1	0
45	BURST FORMS	82	3.5	2.1	23	14	5	46	CALCULATE	29	3.1	1.6	1	8	4
47	CALCULATE INVENTORY	5	4.0	2.0	0	1	0	48	CALCULATE PAYROLL	11	4.4	1.8	7	1	1
49	CARD TO TAPE CONVERSION	2	0.0	0.0	0	0	1	50	CHANGE JOB CONTROL	4	3.0	2.0	0	1	1
51	CHANGE PROGRAMS	45	3.9	1.8	14	8	5	52	CHANGE RIBBON	10	3.9	2.0	6	1	1
53	CHANGE SYSTEMS	9	4.1	1.6	7	1	1	54	CLEAR CARD JAMS	53	3.2	1.6	2	3	0
55	CLEAR PAPER JAMS	32	3.0	2.0	1	2	0	56	CLERICAL WORK	21	3.5	2.1	14	5	0
57	CODE CARDS	9	4.0	1.0	0	1	0	58	CODE FORMS	11	3.0	1.0	0	1	0
59	CODE INPUT DATA	439	3.0	1.2	24	19	7	60	CODE INPUT FORMS	124	2.9	1.4	7	7	2
61	COLLATE CARDS	44	3.8	1.6	6	5	2	62	COLLATE CARDS, MANUAL	12	4.0	1.3	1	2	0
63	COLLATE FORMS	14	3.3	1.5	2	2	1	64	COLLATE RECORDS	54	2.5	1.3	3	1	0
65	COLLECT DATA	44	3.0	1.0	6	6	4	66	COLLECT FORMS	37	2.7	1.5	2	4	1
67	COLLECT INPUT	2	0.0	0.0	0	0	1	68	COMMUNICATION, VERBAL	48	3.9	1.6	8	0	12
69	COMPUTER JOBS	543	3.2	1.5	20	36	10	70	CONDUCT IN SERVICE TRAINING	3	4.0	1.5	2	0	0
71	CONDUCT MEETING	16	4.3	1.6	8	1	5	72	CONDUCT RESEARCH	2	1.0	1.0	1	0	0
73	CONDUCT TOURS	6	4.0	3.0	3	0	2	74	CONSULT ANALYSTS	5	4.0	2.0	2	1	2
75	CONSULT COORDINATORS	16	4.0	1.5	0	2	0	76	CONSULT MANAGEMENT	24	3.9	1.4	5	2	5
77	CONSULT MANUFACTURER	9	3.5	1.8	2	2	2	78	CONSULT OPERATORS	6	2.0	0.5	2	0	1
79	CONSULT PROGRAMMERS	21	3.8	1.6	7	3	3	80	CONSULT SUPERVISORS	42	3.9	1.6	7	5	11
81	CONSULT USERS	46	3.5	1.8	19	12	7	82	CONSULTATION	51	3.6	1.5	9	4	17
83	COORDINATE MAINTENANCE	7	3.7	1.0	3	0	1	84	COORDINATE OPERATIONS	12	2.8	1.2	4	1	0
85	COORDINATE SYSTEMS	40	3.1	1.5	9	5	1	86	COORDINATE WORK FLOW	97	3.1	1.3	23	12	3
87	COORDINATING	31	3.3	1.5	9	7	1	88	COPY BLUEPRINTS	2	4.0	3.0	1	0	0
89	CORRECT ERRORS	82	3.2	1.5	22	22	17	90	CORRECT INPUT DATA	28	2.5	1.5	1	1	1
91	CORRECT JOB CONTROL	24	3.3	2.7	3	0	0	92	CORRECT MALFUNCTION	11	4.3	1.3	2	1	1
93	CORRECT PROGRAMS	37	2.9	1.3	4	3	2	94	CORRECT TAPE	4	6.0	2.0	1	0	0
95	COUNSEL EMPLOYEES	11	3.8	1.6	5	0	2	96	DEBUG PROGRAMS	45	3.2	1.2	10	11	11
97	DEBUG SYSTEMS	4	4.0	1.0	1	0	2	98	DECOLLATE OUTPUT	58	3.3	2.0	11	10	3
99	DELIVER CARDS	5	0.0	0.0	0	0	1	100	DELIVER COMPUTER JOBS	42	2.6	1.6	1	4	6
101	DELIVER DATA	10	2.8	1.5	2	2	1	102	DELIVER FINISHED WORK	10	2.8	2.0	1	5	3
103	DELIVER FORMS	47	3.2	1.8	8	9	8	104	DELIVER INPUT DATA	3	0.0	0.0	0	0	2
105	DEMONSTRATE COMPUTER	1	2.5	2.0	0	2	0	106	DEMONSTRATE TERMINAL	1	4.0	2.0	0	1	0
107	DEPOSIT FUNDS	2	0.0	0.0	0	0	1	108	DESIGN CARD LAYOUTS	7	4.3	1.3	4	3	2
109	DESIGN DATA CODES	2	4.0	1.0	1	0	0	110	DESIGN DATA FLOW	5	4.3	2.0	2	1	0

TABLE III (CONTINUED)

TASK LIST WITH TOTALS AND MEANS OF RANGE, FREQUENCY, AND IMPORTANCE.

111	DESIGN DRUM CARD	15	4.0	1.1	8	0	1
112	DESIGN FILES	8	4.0	1.6	7	1	0
113	DESIGN FLOORPLAN	7	3.8	2.3	4	0	0
114	DESIGN FORMS	27	4.0	2.0	16	5	6
115	DESIGN INPUT FORMATS	11	4.0	1.3	8	0	0
116	DESIGN JOB CONTROL	8	3.0	2.0	1	0	3
117	DESIGN OUTPUT FORMATS	9	3.4	1.4	6	2	2
118	DESIGN SYSTEMS	48	3.4	1.5	26	7	0
119	DESIGN TESTS	2	1.0	1.0	1	0	0
120	DEVELOP DESIGNS	1	3.0	1.0	0	1	0
121	DEVELOP EMPLOYEE TRAINING	4	4.0	1.8	3	1	0
122	DEVELOP INPUT DATA	3	2.7	1.0	2	1	0
123	DEVELOP PROCEDURES	15	3.8	1.7	10	2	0
124	DEVELOP PROGRAMS	23	4.3	1.6	7	2	1
125	DEVELOP SYSTEMS	3	3.0	1.0	1	0	1
126	DIAGRAM	6	4.0	1.7	5	1	0
127	DISCUSS PROBLEMS	8	5.0	1.0	1	0	3
128	DISK TO TAPE CONVERSION	9	3.0	1.0	1	0	1
129	DISK, BUILD BACK UP	2	4.0	1.0	1	0	0
130	DISK, COPY	3	3.5	1.0	1	1	1
131	DISK, FILE	2	3.0	2.0	1	0	0
132	DISK, MAINTAIN	2	4.0	1.3	1	2	0
133	DISK, MAP	2	0.0	0.0	0	0	1
134	DISK, MOUNT	104	3.1	1.6	0	9	3
135	DISK, PREPARE LABELS	20	3.5	1.5	0	2	2
136	DISK, SET UP DRIVES	52	3.0	1.0	1	1	0
137	DISTRIBUTE OUTPUT	65	3.1	1.7	15	15	12
138	DISTRIBUTE REPORTS	26	3.2	1.9	6	5	9
139	DISTRIBUTE SUPPLIES	5	3.0	1.8	1	4	1
140	DISTRIBUTE WORK	42	3.2	1.3	3	3	1
141	DOCUMENTATION	11	4.0	1.8	5	3	0
142	DOCUMENT PROCEDURES	9	4.1	1.9	6	1	0
143	DOCUMENT PROGRAMS	38	3.5	1.6	17	11	1
144	DOCUMENT SYSTEMS	24	3.8	1.6	13	4	4
145	DUPLICATING	4	4.0	2.2	3	2	0
146	EDIT CODING	6	3.0	1.0	0	1	0
147	EDIT FORMS	22	3.3	1.6	2	5	1
148	EDIT INPUT DATA	97	2.8	1.3	8	13	3
149	EDIT OUTPUT	11	3.4	1.6	3	6	2
150	EDIT REPORTS	8	5.0	1.5	2	0	3
151	EDUCATE SELF	18	3.6	1.4	11	1	4
152	EDUCATE TERMINAL USERS	5	4.0	1.0	1	0	0
153	EDUCATE USERS	3	4.0	2.0	2	0	0
154	EMPTY CHIP BOX	3	4.0	2.0	2	0	0
155	ENCODE DATA	3	3.0	3.0	1	0	1
156	ENCODE FORMS	29	3.0	3.0	0	1	0
157	ENCODE TAPE	25	3.5	2.0	1	1	0
158	ENFORCE POLICIES	11	1.8	1.2	8	1	0
159	ESTABLISH POLICIES	5	2.7	1.0	3	0	1
160	ESTABLISH PRIORITIES	18	2.6	1.2	8	3	2
161	ESTABLISH STANDARDS	14	4.0	1.8	7	1	0
162	EVALUATE EMPLOYEES	37	4.3	1.7	25	4	1
163	EVALUATE SYSTEMS	10	3.0	1.2	5	1	1
164	EVALUATING	10	3.8	1.6	9	0	0
165	EXPAND FACILITIES	4	6.0	3.0	1	0	0
166	EXPLAIN SYSTEMS	5	5.0	1.0	1	0	0
167	EXTRACT DATA	1	3.0	2.0	0	1	0
168	FEASIBILITY STUDY	10	4.2	1.4	6	3	0
169	FILE	19	3.5	1.7	10	3	2
170	FILE DISKS	6	3.0	2.0	0	1	0
171	FILE FINISHED WORK	1	1.0	2.0	0	1	0
172	FILE FORMS OR CARDS	82	3.1	1.8	21	16	5
173	FILE MICROFILM	1	3.0	2.0	0	1	0
174	FILE OUTPUT	19	3.6	1.4	4	1	3
175	FILE PRINTER LOOPS	2	3.0	2.0	1	0	0
176	FILE REPORTS	24	3.7	1.4	5	2	1
177	FILE SOURCE DOCUMENTS	13	3.0	1.0	1	2	1
178	FILE TAPES	49	3.4	1.7	6	5	4
179	FLOWCHART	7	3.9	1.4	4	3	2
180	FLOWCHART PROCEDURES	2	0.0	0.0	0	0	1
181	FLOWCHART PROGRAMS	14	3.1	1.4	13	6	0
182	FLOWCHART SYSTEM	8	4.3	1.5	5	1	0
183	FOLLOW INSTRUCTIONS	13	3.0	1.1	6	2	1
184	HOUSEKEEPING	30	3.0	2.1	13	9	5
185	IMPLEMENT SYSTEMS	52	3.9	1.3	23	3	2
186	INSERT FORMS	2	0.0	0.0	0	0	1
187	INSTRUCT EMPLOYEES	17	3.5	1.4	7	1	3
188	INSTRUCT OPERATORS	19	3.9	1.3	3	5	2
189	INSTRUCT PROGRAMMER	5	3.0	1.0	0	1	1
190	INSTRUCT TERMINAL USERS	11	3.0	1.0	0	1	0
191	INSTRUCT USERS	6	3.2	1.2	3	2	0
192	INTERPRET CARDS	129	3.4	2.1	20	15	10
193	INTERVIEW APPLICANTS	13	4.1	1.6	7	2	1
194	INVENTORY SUPPLIES	19	3.4	2.0	10	5	2
195	JOB ASSISTANCE	122	3.3	1.7	25	11	12
196	KEY DATA	713	2.5	1.0	2	12	1
197	KEY TAPE	16	3.8	1.3	2	2	0
198	KEYPUNCH CARDS	115	3.1	1.8	19	21	12
199	KEYPUNCH DRUM CARDS	9	3.8	1.0	6	0	0
200	KEYPUNCH JOBS	655	2.7	1.2	12	46	4
201	KEYPUNCH JOB CARDS	1	4.0	2.0	0	1	0
202	KEYPUNCH JOB CONTROL CARDS	35	3.3	1.3	21	10	2
203	KEYPUNCH PROGRAMS	38	3.6	1.9	16	11	1
204	LABELING	53	3.1	1.6	7	1	1
205	LIAISON	57	2.9	1.5	21	9	4
206	LOAD COMPOSER	1	3.0	1.0	0	1	0
207	LOAD INPUT DEVICES	17	2.8	1.3	5	1	1
208	LOAD MTST	1	3.0	1.0	0	1	0
209	LOAD OUTPUT DEVICES	17	2.8	1.5	5	1	1
210	LOAD TAPES	3	1.0	1.0	0	1	0
211	LOAD TRANSCRIBER	1	1.0	1.0	0	1	0
212	LOG ATTENDANCE	6	4.0	1.6	4	3	1
213	LOG BATCHES	17	2.5	1.0	1	3	3
214	LOG COMPUTER TIME	36	3.2	1.5	9	4	0
215	LOG DATA FLOW	6	2.0	1.5	0	2	0
216	LOG FORMS	6	3.0	1.5	2	2	0
217	LOG MALFUNCTIONS	9	3.7	1.7	4	2	2
218	LOG OUTPUT	9	4.0	1.5	3	1	2
219	LOG PRODUCTION	15	3.6	2.0	4	1	0
220	LOG TAPES	23	3.0	1.6	1	4	0

TABLE III (CONTINUED)

TASK LIST WITH TOTALS AND MEANS OF RANGE, FREQUENCY, AND IMPORTANCE.

221	LOG TERMINAL USAGE	15	2.8	1.5	2	2	2	222	LOG TOTALS	6	3.0	1.0	0	2	0
223	LOG WORK	42	3.0	1.4	11	12	6	224	LOG	17	2.9	1.6	12	13	4
225	MAIL OUTPUT	14	3.9	2.0	3	7	2	226	MAIL, DATE	11	3.0	1.0	0	1	0
227	MAIL, DISTRIBUTE	11	2.8	1.8	3	3	2	228	MAIL, PICK UP	16	3.2	1.6	2	3	0
229	MAIL, PREPARE	17	3.3	1.8	5	5	4	230	MAIL, PROCESS	12	3.1	1.8	6	12	3
231	MAIL, SORT	19	2.8	1.5	1	9	3	232	MAINTAIN EQUIPMENT	16	3.0	1.4	9	8	3
233	MAINTAIN FILES	37	3.2	1.8	13	1	0	234	MAINTAIN LEDGERS	5	5.0	2.0	0	2	0
235	MAINTAIN LIBRARY	6	3.6	1.6	5	0	0	236	MAINTAIN LOG	14	3.3	1.4	6	2	1
237	MAINTAIN MANUALS	8	4.3	1.7	2	1	0	238	MAINTAIN PROGRAMS	12	2.8	1.2	11	2	0
239	MAINTAIN SECURITY	6	1.7	1.0	2	1	3	240	MAINTAIN SOFTWARE	2	1.0	1.0	1	0	0
241	MAINTAIN SYSTEMS	25	2.8	1.2	18	8	0	242	MAKE CHANGE	2	4.0	3.0	1	0	0
243	MAKE COFFEE	5	3.0	2.5	1	1	0	244	MATCH DATA	9	3.7	1.2	1	5	1
245	MICROFILMING	6	3.6	2.0	1	4	4	246	MICR PROCESSING	2	0.0	0.0	0	0	1
247	MONITOR COMPUTER	23	2.0	1.5	2	0	0	248	MONITOR EQUIPMENT	28	3.2	1.6	6	3	2
249	MONITOR INPUT	32	1.0	1.0	0	1	1	250	MONITOR INVENTORY	33	3.5	1.9	11	3	2
251	MONITOR OUTPUT	2	4.0	1.0	1	0	0	252	MONITOR SYSTEM	68	2.6	1.4	20	13	10
253	MONITOR TERMINAL	23	2.7	1.3	1	2	1	254	MONITOR WORK FLOW	64	3.0	1.5	20	12	4
255	MONITORING	11	2.1	1.5	6	7	1	256	MOUNT PLOTTAPE	6	3.0	2.0	0	0	1
257	MOVE CARDS OR FORMS	19	3.0	1.7	7	3	3	258	MOVE TAPES	26	3.7	1.8	3	7	1
259	NEWSWRITING	2	4.5	2.0	1	1	0	260	OPERATE CARD EQUIPMENT	4	3.4	1.6	3	4	0
261	OPERATE COMPUTER	15	3.2	2.1	9	9	1	262	OPERATE MTST	2	4.0	2.0	1	0	0
263	OPERATE OFFICE EQUIPMENT	9	3.8	2.0	3	2	0	264	OPERATE PLOTTER	44	3.2	2.0	7	4	0
265	OPERATE PRINTER	8	2.7	1.7	1	2	1	266	OPERATE SYSTEM	4	3.3	2.3	2	1	1
267	OPERATE TERMINAL	102	3.0	1.3	5	19	3	268	ORAL PRESENTATIONS	16	4.3	2.0	7	0	4
269	ORDER EQUIPMENT	9	4.7	1.7	2	1	0	270	ORDER PASTRY	2	3.0	3.0	1	0	0
271	ORDER SUPPLIES	62	4.0	2.0	38	8	2	272	ORIENT EMPLOYEES	9	4.8	1.5	3	1	1
273	PACKET JOBS	61	1.0	1.0	0	1	0	274	PERFORATE PAPERS	1	3.0	2.0	0	1	0
275	PLANNING	35	2.5	1.4	9	4	3	276	PLAN MEETINGS	3	1.5	1.0	1	3	1
277	PLAN SYSTEMS	11	5.0	1.0	2	1	1	278	PLAN WORK FLOW	5	5.0	2.0	0	1	0
279	PLAN WORK SCHEDULE	4	3.0	2.0	3	1	0	280	POST	4	3.0	2.0	0	1	3
281	POST FLOWCHART	7	3.0	2.0	1	1	0	282	POST OUTPUT	8	3.0	1.0	1	0	1
283	POST REPORTS	4	5.0	1.0	1	0	0	284	PREPARE BUDGET	10	5.6	1.6	7	1	0
285	PREPARE EMPLOYEE TRAINING	6	3.8	2.0	5	0	0	286	PREPARE INPUT DATA	35	3.9	1.3	10	8	2
287	PREPARE LOG	1	5.0	3.0	0	1	0	288	PREPARE PROGRAM BOOKS	2	4.0	2.0	1	0	0
289	PREPARE REPORTS	111	4.2	1.7	31	10	10	290	PREPARE USER GUIDE	9	4.5	1.5	3	1	1
291	PREPRARE PROGRAMMER BOOKS	2	4.0	3.0	1	0	0	292	PRINTER, CHANGE RIBBON	28	3.5	2.2	5	5	0
293	PRINTER, CUT LOOPS	8	4.7	2.0	3	0	0	294	PRINTER, LOAD FORMS	53	3.1	1.4	4	4	5
295	PRINTER, MOUNT CHAIN	1	3.0	2.0	0	1	0	296	PRINTER, MOUNT LOOPS	10	3.0	2.0	1	0	0
297	PRINTER, PREPARE	2	0.0	0.0	0	0	1	298	PROCESS CORRESPONDENCE	16	3.3	1.5	6	9	4
299	PROCESS INPUT DATA	51	3.4	1.4	6	5	0	300	PROCESS OUTPUT	77	4.1	1.2	11	7	0
301	PROCESS PAPER TAPE	2	0.0	0.0	0	0	1	302	PROCESS REPORTS	67	3.8	2.2	4	2	0
303	PROOFREAD	9	3.4	2.3	5	4	0	304	READ	6	1.5	0.8	4	0	1
305	READ MANUALS	7	3.7	1.7	2	4	2	306	READ MEMOS	20	3.0	2.0	3	0	1
307	RECEIVE CARDS	9	3.7	2.0	1	2	3	308	RECEIVE INSTRUCTIONS	8	4.0	1.0	1	0	3
309	RECEIVE JOB REQUESTS	6	2.5	1.0	2	0	3	310	RECEIVE LEDGERS	5	5.0	2.0	0	2	0
311	RECEIVE OUTPUT	16	3.3	2.0	2	1	2	312	RECEIVE SALESMEN	5	4.0	2.5	1	1	3
313	RECEIVE SOURCE DOCUMENTS	8	3.0	2.0	1	1	2	314	RECEIVE TRAINING	8	4.3	2.7	3	0	2
315	RECOMMEND CHANGES	9	2.9	1.8	7	1	1	316	RECOMMEND PROMOTIONS	4	4.7	1.3	3	0	0
317	REFER TO FILES	10	3.8	2.5	4	4	5	318	RELAY INFORMATION	43	3.2	1.4	15	2	3
319	RELIEVE EMPLOYEE	10	3.7	1.9	7	2	0	320	RELIEVE OPERATORS	23	3.9	1.8	7	1	6
321	RELIEVE SUPERVISOR	11	4.0	1.8	3	1	0	322	REPLENISH SUPPLIES	21	3.8	2.3	6	4	5
323	REPRODUCE CARDS	43	3.5	2.0	6	7	5	324	REVIEW DOCUMENTATION	15	3.3	1.4	10	2	2
325	REVIEW MANUALS	6	3.0	1.0	4	0	1	326	REVIEW OPERATIONS	5	2.4	1.7	2	1	0
327	REVIEW OUTPUT	8	4.3	1.8	3	1	2	328	REVIEW PROCEDURES	9	3.8	1.3	4	0	1
329	REVIEW PROGRAMS	32	3.8	1.4	6	2	2	330	REVIEW REPORTS	13	3.8	1.6	7	1	1

TABLE III (CONTINUED)

TASK LIST WITH TOTALS AND MEANS OF RANGE, FREQUENCY, AND IMPORTANCE.

331	REVIEW REQUESTS	7	4.3	1.3	3	0	0	332	REVIEW SPECIFICATIONS	12	3.0	1.0	1	0	0
333	REVIEW SYSTEMS	29	2.8	1.5	11	0	2	334	REVIEW WORK LOG	15	3.0	1.4	5	4	5
335	REVIEWING	7	4.0	1.3	2	1	2	336	REVISE MANUALS	2	0.0	0.0	0	0	1
337	ROUTE CALLERS	1	1.0	1.0	0	1	0	338	ROUTE INCOMING CALLS	62	3.0	2.0	1	0	0
339	RUN ERRANDS	2	2.0	3.0	0	2	1	340	SALVAGE UNUSED STOCK	4	3.0	2.0	1	2	0
341	SCHEDULE COMPUTER TIME	28	3.4	1.5	12	8	5	342	SCHEDULE MAINTENANCE	12	4.0	1.6	4	1	0
343	SCHEDULING	9	3.6	1.3	6	1	2	344	SCRAP CARDS	3	2.5	2.5	2	0	0
345	SELECT CARDS	2	0.0	0.0	0	0	1	346	SELECT PERSONNEL	8	4.0	1.6	7	1	0
347	SELECT PROGRAMS	2	1.5	1.0	1	1	0	348	SELL SUPPLIES	2	4.0	2.0	1	0	0
349	SEPARATE CARDS	7	1.5	0.5	2	0	1	350	SEPARATE FORMS	15	3.4	1.7	5	2	0
351	SEPARATE OUTPUT	67	3.1	1.6	21	16	5	352	SHRED FORMS	2	3.0	2.0	1	0	0
353	SIGN DOCUMENTS	2	1.0	1.0	1	0	0	354	SOLVE PROBLEMS	34	3.5	1.2	3	3	6
355	SORT CARDS	179	3.5	1.8	21	24	9	356	SORT FORMS	17	3.6	1.8	4	6	4
357	SORT INPUT DATA	6	3.5	1.5	1	1	0	358	SORT OUTPUT DATA	1	4.0	2.0	0	1	0
359	SORT OUTPUT	4	3.7	1.7	2	1	1	360	SORT REPORTS	4	4.0	1.6	3	2	0
361	SPECIAL ASSIGNMENTS	97	3.7	2.1	34	8	3	362	STAMP FORMS	38	3.0	1.1	3	5	4
363	STORE FORMS OR CARDS	60	3.8	2.3	30	8	0	364	STUDY	23	2.9	1.3	12	3	6
365	STUDY SYSTEMS	10	3.0	1.0	1	1	0	366	SUPERVISE OPERATIONS	10	2.5	1.0	8	3	1
367	SUPERVISE PERSONNEL	51	2.8	1.3	33	11	3	368	SUPERVISING	26	3.5	1.3	11	6	3
369	SYSTEM PREPARATION	75	3.2	1.1	13	7	4	370	TAB, LIST CARDS	58	3.5	1.5	5	6	1
371	TAB, RUN TOTALS	7	0.0	0.0	0	0	1	372	TABULATE TAPE DATA	5	4.0	1.0	0	1	0
373	TAKE TURN OVER	4	3.0	1.3	0	3	3	374	TALLY LOG SHEETS	4	5.0	2.0	1	0	0
375	TAPE, BLOCK	2	0.0	0.0	0	0	1	376	TAPE, BUILD BACK UP	35	4.1	1.6	11	1	1
377	TAPE, CATALOG	8	3.0	1.0	0	1	1	378	TAPE, CLEAN DRIVES	24	3.0	2.1	6	6	2
379	TAPE, CLEAN	1	4.0	3.0	0	1	0	380	TAPE, CODE	7	3.0	1.0	0	1	0
381	TAPE, DESIGN LAYOUT	2	4.0	2.0	1	0	0	382	TAPE, DISTRIBUTE	7	3.0	1.3	3	0	1
383	TAPE, FILE	28	3.0	2.0	7	0	0	384	TAPE, LOG USAGE	2	1.0	1.0	1	0	0
385	TAPE, MAIL	4	4.0	1.0	0	1	0	386	TAPE, MAINTAIN	6	3.2	1.6	4	1	1
387	TAPE, MOUNT	147	3.3	1.5	3	8	3	388	TAPE, PREPARE	23	3.3	1.0	2	2	0
389	TAPE, PREPARE LABELS	64	3.2	1.8	15	11	6	390	TAPE, PRINT	6	0.0	0.0	0	0	2
391	TAPE, RELEASE	2	3.0	2.0	0	1	1	392	TAPE, ROTATE	2	3.0	1.0	1	0	0
393	TAPE, SCRATCH	5	4.5	1.0	1	1	1	394	TAPE, SEARCH	1	4.0	3.0	0	1	0
395	TAPE, SELECT	2	0.0	0.0	0	0	1	396	TAPE, SORT	2	0.0	0.0	0	0	1
397	TAPE, STORE	3	3.5	1.5	2	0	0	398	TAPE, TEST	2	3.0	2.0	0	1	1
399	TAPE, UPDATE	12	5.0	2.0	1	0	0	400	TEACH CLASS	8	4.8	2.4	2	3	1
401	TECHNICAL ADVICE	7	4.0	1.8	4	0	0	402	TELEPHONING	378	2.9	1.8	23	32	33
403	TELEPROCESSING	3	3.0	1.3	2	2	0	404	TERMINAL, KEY DICTATION	1	3.0	1.0	0	1	0
405	TEST HARDWARE	1	4.0	2.0	0	1	0	406	TEST PROGRAMS	130	3.5	1.6	21	19	9
407	TEST SYSTEMS	8	4.3	1.4	5	2	0	408	TRACE ERRORS	43	2.9	1.6	6	4	9
409	TRACE MALFUNCTION	7	3.8	1.2	2	3	0	410	TRAIN EMPLOYEES	20	4.0	1.4	10	2	0
411	TRAIN OPERATORS	24	3.9	1.5	14	8	1	412	TRANSFER DATA	9	3.0	1.5	5	3	1
413	TRAVEL	10	4.0	1.3	7	0	0	414	TROUBLESHOOTING	16	2.9	1.3	5	2	1
415	TYPE	51	3.4	1.9	8	6	0	416	TYPE FORMS	7	3.2	1.8	1	4	1
417	TYPE INSTRUCTIONS	3	4.0	1.5	2	0	0	418	TYPE LETTERS	9	2.8	1.4	1	4	1
419	TYPE MEMOS	4	2.8	1.4	1	4	0	420	TYPE REPORTS	17	3.7	1.7	1	2	1
421	UPDATA DATA	153	3.0	1.0	2	0	0	422	UPDATE DOCUMENTATION	10	3.8	1.5	5	1	2
423	UPDATE FILES	39	3.2	1.5	11	2	4	424	UPDATE INPUT DATA	16	2.8	1.2	2	4	1
425	UPDATE JOB CONTROL	10	3.6	1.3	5	2	0	426	UPDATE LIBRARY	17	3.6	1.6	11	4	1
427	UPDATE LOG	5	2.7	1.7	0	6	2	428	UPDATE MANUALS	24	3.6	1.6	14	4	3
429	UPDATE OUTPUT	17	3.4	1.4	4	1	1	430	UPDATE PROCEDURES	12	3.6	1.2	10	0	1
431	UPDATE PROGRAMS	2	4.0	1.0	0	1	1	432	UPDATE REPORTS	9	2.3	1.0	2	1	2
433	UPDATE SYSTEMS	18	3.3	1.3	8	3	1	434	VERIFICATION	7	3.3	1.8	3	5	3
435	VERIFY CARDS	157	2.9	1.2	9	17	3	436	VERIFY DATA	43	2.6	1.0	10	7	7
437	VERIFY INPUT DATA	22	3.3	1.5	7	4	3	438	VERIFY KEYPUNCHED JOBS	85	2.7	1.2	0	12	0
439	VERIFY OUTPUT VALIDITY	133	3.5	1.4	24	16	20	440	VERIFY PROGRAMS	2	4.0	2.0	1	1	0

TABLE III (CONTINUED)

TASK LIST WITH TOTALS AND MEANS OF RANGE, FREQUENCY, AND IMPORTANCE.

441	VERIFY REPORTS	4	3.7	1.0	1	2	0	442	VERIFY WORK QUALITY	14	3.5	1.5	6	2	5
443	WIRE CONTROL PANELS	31	3.4	1.6	11	5	1	444	WRITE CORRESPONDENCE	2	3.0	1.0	1	0	0
445	WRITE FORMS	74	3.4	1.9	18	12	2	446	WRITE INSTRUCTIONS	28	3.7	1.7	14	1	1
447	WRITE JOB CONTROL	10	2.3	1.0	3	1	1	448	WRITE JOB DESCRIPTIONS	8	5.0	1.5	2	0	1
449	WRITE LETTERS	18	4.0	2.0	4	4	5	450	WRITE MANUALS	12	3.6	1.3	7	2	2
451	WRITE MEMOS	104	3.3	2.1	23	14	7	452	WRITE NOTES	7	2.0	1.0	2	0	2
453	WRITE PROCEDURES	2	4.0	2.0	1	0	0	454	WRITE PROGRAMS	105	3.4	1.5	38	30	6
455	WRITE PROGRAMS, SPECIAL	51	3.8	1.9	19	5	1	456	WRITE REPORTS	24	3.9	1.9	7	2	1
457	WRITE USER GUIDE	19	4.8	1.7	8	2	0	458	XEROXING	21	3.7	2.3	7	4	3

In addition to performance frequencies and task importance, this table reveals something more of the employees' perceptions of their tasks. It would seem that high relative frequencies in column six would indicate employees who perform certain activities such as tasks 31, 80, 82, 137, 195, 280, 402, 439 (see Table III) without perceiving that activity as "part of the job".

Other items for consideration become apparent when secondary task-descriptors are studied. Within clusters such as in the "assist", "consult", and "instruct" groups, the secondary descriptors seem to profile paths of personal interaction on the job as well as suggesting the interactions' natures. Tasks 21 - 28, for instance, indicate a co-joining of efforts; tasks 74 - 80 portray a two-way "mental" exchange; tasks 187 - 191 allude to a one-way communication. Personnel involved in these situations are revealed by the tasks' secondary descriptors.

At the very least, they indicate the presence of noticeable amounts of helping and communicating within data-control occupations. Similar single tasks seem to strengthen further these clustered components: see tasks 68, 95, 195, 401 (and feel free to scan the rest of the descriptors for words indicating a similar type of activity to include).

Another benefit of studying secondary descriptors becomes obvious as in the "tape" series (tasks 375 - 399). They reveal the clusters' dominant activities as well as the scope and range of related activities. This type of interpretation could lead to an extraction of all activities related to equipment, for the principal word indicating an operation task is listed first. (Sort cards indicates operating a card sorter; Burst Forms requires operating a forms burster; Decollate Output related to a machine that separates multiple copies of printer output.)

This task listing condensed in processing from the original gross total of 4,200 to 458 indicating that about 90% of the work activity was common activity. Combining clusters of similar tasks would increase this commonality only slightly. For example, adding the frequencies of tasks 74 through 82 (the "consult" cluster) would yield an activity performed 222 times (5 + 16 + 26 + 9 + 6 + 21 + 42 + 46 + 51) -- but performed by how many employees? No fewer than 38 (19 + 12 + 7), but all columns 4, 5, and 6 for tasks 74 through 82 may not be added, for the same employee might be included in more than one "consult" task.

Table III identifies data-personnel tasks, but without knowing which occupations require which tasks it begins to become apparent that considering tasks alone without the related job titles may be relatively inconclusive.

Purpose Number Three

To develop both a job-title and a related task-cluster hierarchy.

Tables IV, V, and VI are attempts to present a combination of information that fulfills the third specific purpose of this study. Table IV is a purged, shared task-list showing all of the job titles listing each task (see Data Treatment, Chapter III). Tables V and VI, in essence, merge Tables II and III, retaining the order of III. All three tables achieve the task-title combinations.

Table IV which needs no "reading sample", provides the most condensed task presentation in this study. Only 360 of the 4,200 gross total remain; the other 3,960 either were (1) duplicates and thus absorbed and retained; or were (2) unique to a single occupational title and therefore not retained in this presentation. (This table actually

GENERAL: A cycling alphabetic ordering of numbered, unduplicated tasks followed by each different job title mentioning the task. Job titles were alphabetized by the first four letters of each title.

This listing actually is 4.5% inflated. Due to a fault in the processing program 16 duplicate tasks appear.

Zeros indicate no data reported.

TABLE IV

TASKS LISTED WITH ASSOCIATED JOBS

TASK:	1 APPROVE ORDERS				
	MANAGER DP	MANAGER OPERATIONS	OPERATOR COMPUTER	SECRETARY RECEPTIONI	
TASK:	2 ASSIST OPERATORS				
	OPERATOR COMPUTER II	OPERATOR MASTER	OPERATOR KP	OPERATOR COMPUTER	PROGRAMMER LEAD
	PROGRAMMER				
TASK:	3 BALANCE REPORTS				
	ACCOUNTANT	ANALYST CONTROL II	ANALYST CONTROL I	ANALYST INV CTL	AUDITOR JR
	CLERK TYPIST III	CLERK PAYROLL	CLERK ACCOUNTING	CLERK CONTROL	CLERK SR
	COORDINATOR DP	OPERATOR ENCODER	OPERATOR CRT DATA AN	OPERATOR TAB	OPERATOR MACHINE U R
	OPERATOR DATA INPUT	OPERATOR COMPUTER II	OPERATOR KP	OPERATOR COMPUTER	PROGRAMMER TRAINEE
	RECONCILIATOR PROOF	REPORTS CONTROL	SECRETARY RECEPTIONI	SECRETARY OPERATOR K	SUPERVISOR
	SUPERVISOR DATA CONT	SUPERVISOR OPERATION			
TASK:	4 BALANCE INPUT DATA				
	CLERK TYPIST III	CLERK DP	DATA HANDLER	OPERATOR EDP II	OPERATOR UTILITY
	OPERATOR TAB	OPERATOR COMPUTER	REPORTS CONTROL		
TASK:	5 BURST FORMS				
	ANALYST TRAFFIC	CLERK STOCK II	CLERK PAYROLL	CLERK CONTROL	CLERK MAIL
	CLERK JR	DATA CHECKER	DATA HANDLER	MANAGER OPERATIONS	OPERATOR DATA RECORD
	OPERATOR BURSTER	OPERATOR UTILITY	OPERATOR TAB	OPERATOR EQUIPMENT O	OPERATOR COMPUTER II
	OPERATOR COMPUTER	PROGRAMMER TRAINEE	REPORTS CONTROL	STOCKMAN	SUPERVISOR SHIFT
	SUPERVISOR SHIFT ASS	SUPERVISOR	SUPERVISOR DATA CONT	SUPERVISOR OPERATION	TECHNICIAN EDP I
	TECHNICIAN DATA CONT				
TASK:	6 CODE INPUT DATA				
	ADMINISTRATIVE ASST	ANALYST RESEARCH	ANALYST SYSTEMS I	CLERK DATA CONTROL	CLERK TRAFFIC ACCIDE
	CLERK I	CLERK TYPIST III	CLERK TYPIST II	CLERK TYPIST I	CLERK PAYROLL
	CLERK CODING	CLERK ACCOUNTING	CLERK SR	COORDINATOR NURSING	ENCODER DATA
	ENGINEER	EXPEDITER	MANAGER PROGRAMMING	METER READER	NURSE GENERAL III
	OPERATOR KP I	OPERATOR KP II	OPERATOR KP	OPERATOR COMPUTER	PHYSICIAN GENERAL I
	PHYSICIAN GENERAL II	PROCESSOR	PROGRAMMER OPERATOR	STATISTICIAN	SUPERVISOR KP I
	SUPERVISOR PROGRAMMI	SUPERVISOR	SUPERVISOR DATA CONT	TECHNICIAN DATA CONT	
TASK:	7 COMPUTER JOBS				
	ADMINISTRATIVE ASST	ADMINISTRATIVE ASSIS	ANALYST CONTROL II	ANALYST CONTROL I	AUDITOR JR
	CLERK CODING	CLERK FILE	COORDINATOR DP ACCTG	COORDINATOR DP	DATA HANDLER
	MANAGER OPERATIONS	OPERATOR EDP II	OPERATOR COMPUTER JR	OPERATOR TAB	OPERATOR COMPUTER I
	OPERATOR COMPUTER II	OPERATOR MASTER	OPERATOR DATA CONVER	OPERATOR COMPUTER	PROGRAMMER ENGNR
	PROGRAMMER TRAINEE	PROGRAMMER OPERATOR	PROGRAMMER	SECRETARY	SUPERVISOR SHIFT ASS
	SUPERVISOR	SUPERVISOR DP	SUPERVISOR OPERATION	TEACHER	TECHNICIAN EDP I
	TECHNICIAN EDP II	TECHNICIAN EDP III			
TASK:	8 CONSULTATION				
	ANALYST SYSTEMS CHIE	ANALYST SYSTEMS SR	ANALYST SYSTEMS I	ANALYST RESEARCH OPE	COORDINATOR
	COORDINATOR HOSPITAL	COORDINATOR DP	OPERATOR KP I	OPERATOR MASTER	OPERATOR COMPUTER
	PROGRAMMER ENGNR	PROGRAMMER II	PROGRAMMER I	PROGRAMMER	SUPERVISOR DATA PREP
	SUPERVISOR PROGRAMMI	SUPERVISOR DP SYSTEM	SUPERVISOR		

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK: 9 COORDINATE WORK FLOW				
ANALYST SYSTEMS SR	COORDINATOR CONTROL	COORDINATOR NURSING	COORDINATOR DP	COORDINATOR JOB STRE
DIRECTOR DP	MANAGER DP	MANAGER OPERATIONS	OPERATOR EQUIPMENT D	OPERATOR COMPUTER I
OPERATOR COMPUTER II	OPERATOR COMPUTER	SCHEDULER OPERATIONS	SCHEDULER JOB	STATISTICIAN
SUPERVISOR SHIFT	SUPERVISOR KP I	SUPERVISOR DATA PREP	SUPERVISOR PROGRAMMI	SUPERVISOR
SUPERVISOR DP	SUPERVISOR DP ASST	SUPERVISOR KP	TECHNICIAN EDP III	
TASK: 10 CORRECT ERRORS				
ANALYST CONTROL II	ANALYST CONTROL I	ANALYST INV CTL	ANALYST SYSTEMS I	AUDITOR JR
AUDITOR	CLERK STATISTICAL	CLERK I	CLERK TYPIST III	CLERK INPUT OUTPUT
CLERK TYPIST II	CLERK STENO II	COORDINATOR BILLING	COORDINATOR NURSING	COORDINATOR HOSPITAL
COORDINATOR DP	DATA CHECKER	DESIGNER	GROUP LEADER	MANAGER FOOD SERVICE
OPERATOR KP I	OPERATOR KP II	OPERATOR KP LEAD	OPERATOR COMPUTER TR	OPERATOR MACHINE U R
OPERATOR COMPUTER II	OPERATOR MASTER	OPERATOR KP	OPERATOR COMPUTER	PROCESSOR
PROGRAMMER TECHNICIA	PROGRAMMER II	PROGRAMMER I	PROGRAMMER	SCHEDULER JOB
SECRETARY MTST MTSC	SUPERVISOR PROGRAMMI	SUPERVISOR WPC	SUPERVISOR KP ASST	SUPERVISOR KP
TAPE LIBRARIAN				
TASK: 11 CORRECT INPUT DATA				
OPERATOR KP SR	OPERATOR COMPUTER	PROGRAMMER ENGNR		
TASK: 12 DECOLLATE OUTPUT				
CLERK STOCK II	CLERK INPUT OUTPUT	CLERK STENO II	CLERK TYPIST I	CLERK CONTROL
CLERK MAIL	DATA HANDLER	OPERATOR KP I	OPERATOR KP II	OPERATOR BURSTER
OPERATOR EQUIPMENT D	OPERATOR COMPUTER	STOCKMAN	SUPERVISOR SHIFT	SUPERVISOR DATA CONT
SUPERVISOR OPERATION	TECHNICIAN EDP I	TECHNICIAN DATA CONT		
TASK: 13 DISK, COPY				
OPERATOR COMPUTER	PROGRAMMER	SUPERVISOR DP ASST		
TASK: 14 DISTRIBUTE REPORTS				
ANALYST CONTROL II	ANALYST CONTROL I	ANALYST SYSTEMS I	CLERK EDP CONTROL I	CLERK CASHIER
CLERK INPUT OUTPUT	OPERATOR MACHINE DP	OPERATOR EQUIPMENT D	OPERATOR MACHINE U R	OPERATOR COMPUTER I
OPERATOR COMPUTER	PROGRAMMER LEAD	PROGRAMMER OPERATOR	PROGRAMMER SFTWRE AN	REPORTS CONTROL
STAGER	SUPERVISOR DATA CONT			
TASK: 15 EDIT INPUT DATA				
ANALYST CONTROL II	ANALYST CONTROL I	CLERK TYPIST III	CLERK TYPIST II	CLERK SR
COORDINATOR NURSING	COORDINATOR HOSPITAL	OPERATOR KP I	OPERATOR KP II	OPERATOR KP SR
OPERATOR MACHINE U R	OPERATOR COMPUTER	PROGRAMMER ENGNR	REPORTS CONTROL	SUPERVISOR DP
SUPERVISOR DATA CONT	SUPERVISOR KP	TECHNICIAN DATA CONT		
TASK: 16 HOUSEKEEPING				
CLERK TYPIST II	CLERK CONTROL SET UP	DATA HANDLER	MANAGER ADM SERVICES	OPERATOR COMPUTER SR
OPERATOR KP I	OPERATOR TAB	OPERATOR EQUIPMENT O	OPERATOR COMPUTER I	OPERATOR KP
OPERATOR COMPUTER	SECRETARY	SUPERVISOR SHIFT ASS	SUPERVISOR OPERATION	SUPERVISOR KP
TAPE LIBRARIAN				
TASK: 17 IMPLEMENT SYSTEMS				
ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST RESEARCH DP	AUDITOR	COORDINATOR DP
DIRECTOR DP	MANAGER SOFTWARE SEC	MANAGER OPERATIONS	OPERATOR COMPUTER	PROGRAMMER SYSTEMS
PROGRAMMER ANALYST	SUPERVISOR DATA PREP	SUPERVISOR SYSTEMS A	SUPERVISOR	

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK: 18 INTERPRET CARDS				
ADMINISTRATIVE ASST	ANALYST TRAFFIC	AUDITOR JR	CLERK INPUT OUTPUT	CLERK TYPIST II
CLERK CODING	CLERK CONTROL SET UP	CLERK FILE	CLERK JR	DATA CHECKER
DATA HANDLER	OPERATOR EDP II	OPERATOR KP I	OPERATOR UTILITY	OPERATOR TAB
OPERATOR KP SR	OPERATOR MACHINE U R	OPERATOR COMPUTER II	OPERATOR KP	OPERATOR COMPUTER
PROGRAMMER ENGNR	PROGRAMMER I	PROGRAMMER OPERATOR	SCHEDULER OPERATIONS	SUPERVISOR SHIFT
SUPERVISOR DP ASST	TAPE LIBRARIAN			
TASK: 19 KEYPUNCH CARDS				
ADMINISTRATIVE ASST	ANALYST RESEARCH	ANALYST SYSTEMS	ANALYST SYSTEMS I	CLERK I
CLERK TYPIST III	CLERK TYPIST II	CLERK STENO II	CLERK PAYROLL	DATA CHECKER
OPERATOR DP SR	OPERATOR DP	OPERATOR I DP	OPERATOR EDP II	OPERATOR COMPUTER TR
OPERATOR TAB	OPERATOR MACHINE U R	OPERATOR COMPUTER I	OPERATOR COMPUTER	PROGRAMMER ENGNR
PROGRAMMER II	PROGRAMMER I	PROGRAMMER LEAD	PROGRAMMER SFTWRE AN	PROGRAMMER
PROGRAMMER ANALYST	REPORTS CONTROL	SCHEDULER OPERATIONS	SECRETARY RECEPTIONI	STATISTICIAN
SUPERVISOR SHIFT ASS	SUPERVISOR OPERATION	TAPE LIBRARIAN		
TASK: 20 KEYPUNCH JOBS				
CLERK CODING	CLERK JR	DATA MATERIAL HANDLE	ENCODER DATA	OPERATOR KP I
OPERATOR KP II	OPERATOR DATA RECORD	OPERATOR TAB	OPERATOR KP SR	OPERATOR DATA INPUT
OPERATOR DATA CONVER	OPERATOR KP	OPERATOR COMPUTER	SECRETARY OPERATOR K	SUPERVISOR KP ASST
SUPERVISOR KP				
TASK: 21 KEYPUNCH JOB CONTROL				
ANALYST CONTROL II	ANALYST CONTROL I	CLERK ACCT III	CLERK ACCT II	DATA HANDLER
MANAGER OPERATIONS	OPERATOR DP SR	OPERATOR DP	OPERATOR UTILITY	OPERATOR TAB
OPERATOR COMPUTER	PROGRAMMER II	PROGRAMMER TRAINEE	PROGRAMMER I	SCHEDULER OPERATIONS
SUPERVISOR DP ASST				
TASK: 22 LOAD OUTPUT DEVICES				
OPERATOR COMPUTER JR	OPERATOR COMPUTER I	OPERATOR COMPUTER II	OPERATOR COMPUTER	TECHNICIAN EDP I
TECHNICIAN EDP II				
TASK: 23 LOAD INPUT DEVICES				
OPERATOR COMPUTER JR	OPERATOR COMPUTER I	OPERATOR COMPUTER II	OPERATOR COMPUTER	TECHNICIAN EDP I
TECHNICIAN EDP II				
TASK: 24 MAINTAIN SYSTEMS				
ANALYST SYSTEMS SR	COORDINATOR DP ACCTG	COORDINATOR DP	INSTRUCTOR	NURSE GENERAL III
OPERATOR COMPUTER SR	OPERATOR COMPUTER	PROCESSOR	PROGRAMMER TECHNICIA	PROGRAMMER II
PROGRAMMER LEAD	PROGRAMMER	PROGRAMMER ANALYST	SUPERVISOR SHIFT	SUPERVISOR OPERATION
TECHNICAL WRITER				
TASK: 25 MAINTAIN PROGRAMS				
COORDINATOR DP ACCTG	NURSE GENERAL III	OPERATOR COMPUTER	PROGRAMMER III	PROGRAMMER TECHNICIA
PROGRAMMER II	PROGRAMMER	PROGRAMMER ANALYST	SCHEDULER OPERATIONS	SUPERVISOR PROGRAMMI
TASK: 26 MAINTAIN EQUIPMENT				
CLERK JR	DATA HANDLER	OPERATOR COMPUTER SR	OPERATOR UTILITY	OPERATOR TAB
OPERATOR COMPUTER	TAPE LIBRARIAN			

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK: 27 MONITOR WORK FLOW				
ANALYST TRAFFIC	CLERK RECORDS	CLERK PRODUCTION REC	COORDINATOR DP	COORDINATOR JOB STRE
DIRECTOR DP	MANAGER DP	MANAGER SOFTWARE SEC	MANAGER OPERATIONS	OPERATOR COMPUTER SR
OPERATOR KP LEAD	OPERATOR COMPUTER II	OPERATOR COMPUTER	PROGRAMMER III	PROGRAMMER ENGNR
PROGRAMMER II	SCHEDULER OPERATIONS	SCHEDULER JOB	SUPERVISOR SHIFT	SUPERVISOR PROGRAMMI
SUPERVISOR SECTION	SUPERVISOR DATA CONT	SUPERVISOR KP		
TASK: 28 MONITOR SYSTEM				
ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST RESEARCH DP	AUDITOR	CLERK INPUT OUTPUT
COORDINATOR HOSPITAL	COORDINATOR DP	EXPEDITER	MANAGER DP	MANAGER OPERATIONS
OPERATOR COMPUTER SR	OPERATOR COMPUTER JR	OPERATOR DATA INPUT	OPERATOR COMPUTER I	OPERATOR COMPUTER II
OPERATOR MASTER	OPERATOR COMPUTER	PROGRAMMER	PROGRAMMER ANALYST	STAGER
SUPERVISOR SHIFT	SUPERVISOR SHIFT ASS			
TASK: 29 MONITOR COMPUTER				
OPERATOR COMPUTER	TECHNICIAN EDP III			
TASK: 30 MONITOR INVENTORY				
AUDITOR	CLERK TYPIST II	COORDINATOR HOSPITAL	MANAGER ADM SERVICES	MANAGER DP
OPERATOR KP I	OPERATOR MACHINE DP	OPERATOR COMPUTER I	OPERATOR COMPUTER	SUPERVISOR OPERATION
TAPE LIBRARIAN				
TASK: 31 ORDER SUPPLIES				
ADMINISTRATIVE ASST	CLERK STOCK II	CLERK INPUT OUTPUT	CLERK STENO II	CLERK TYPIST I
CLERK JR	COORDINATOR DP ACCTG	COORDINATOR CONTROL	COORDINATOR HOSPITAL	COORDINATOR DP
INSTRUCTOR	MANAGER	MANAGER DP	MANAGER OPERATIONS	OPERATOR KP I
OPERATOR COMPUTER I	OPERATOR DATA CONVER	OPERATOR COMPUTER	SECRETARY RECEPTIONI	SECRETARY
STENOGRAPHER SR	SUPERVISOR DATA PREP	SUPERVISOR DP SYSTEM	SUPERVISOR	SUPERVISOR WPC
SUPERVISOR DP	SUPERVISOR DP ASST	SUPERVISOR OPERATION	TAPE LIBRARIAN	
TASK: 32 PREPARE REPORTS				
ACCOUNTANT	ADMINISTRATIVE ASSIS	ANALYST RESEARCH	ANALYST TRAFFIC SR	ANALYST TRAFFIC
ANALYST SYSTEMS I	AUDITOR JR	AUDITOR	CLERK DATA CONTROL	CLERK EDP CONTROL I
CLERK CASHIER	CLERK PAYROLL	CLERK CONTROL SET UP	CLERK DP	COORDINATOR
COORDINATOR HOSPITAL	COORDINATOR DP	ENGINEER	EXPEDITER	MANAGER DP
OFFICER BUDGET CONTR	OPERATOR KP II	OPERATOR MACHINE U R	OPERATOR COMPUTER	PROGRAMMER ENGNR
PROGRAMMER ANALYST	RECONCILIATOR PROOF	SCHEDULER OPERATIONS	SECRETARY OPERATOR K	SECRETARY
STATISTICIAN	STOCKMAN	SUPERVISOR SHIFT	SUPERVISOR	SUPERVISOR DP
TELECOM OPERATIONS S				
TASK: 33 PRINTER, CHANGE RIBB				
OPERATOR KP II	OPERATOR COMPUTER II	OPERATOR COMPUTER	SUPERVISOR SHIFT	
TASK: 34 PRINTER, LOAD FORMS				
OPERATOR COMPUTER SR	OPERATOR COMPUTER I	OPERATOR COMPUTER II	OPERATOR COMPUTER	SUPERVISOR SHIFT ASS
TECHNICIAN EDP I				
TASK: 35 READ MEMOS				
COORDINATOR HOSPITAL	OPERATOR COMPUTER	PROGRAMMER I		
TASK: 36 RECEIVE JOB REQUESTS				
OPERATOR DATA INPUT	OPERATOR COMPUTER	PROGRAMMER II	SCHEDULER OPERATIONS	SUPERVISOR DATA CONT
TASK: 37 RECOMMEND PROMOTIONS				
ANALYST SYSTEMS SR	OPERATOR COMPUTER	SUPERVISOR		

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK: 38 RELIEVE OPERATORS				
CLERK I	COORDINATOR DP	MANAGER OPERATIONS	OPERATOR DATA RECORD	OPERATOR DATA CONVER
OPERATOR COMPUTER	SCHEDULER OPERATIONS	SUPERVISOR SHIFT	SUPERVISOR KP I	SUPERVISOR WPC
SUPERVISOR OPERATION	SUPERVISOR KP	TECHNICIAN EDP III		
TASK: 39 REVIEW WORK LOG				
ANALYST SYSTEMS SR	COORDINATOR PROGRAM	COORDINATOR HOSPITAL	COORDINATOR DP	COORDINATOR JOB STRE
MANAGER PROGRAMMING	OPERATOR COMPUTER	SCHEDULER OPERATIONS	SUPERVISOR PROGRAMMI	SUPERVISOR OPERATION
TASK: 40 SEPARATE OUTPUT				
ANALYST CONTROL I	ANALYST INV CTL	AUDITOR	CLERK INPUT OUTPUT	CLERK TYPIST I
CLERK CODING	COORDINATOR HOSPITAL	DATA MATERIAL HANDLE	DATA HANDLER	MANAGER ADM SERVICES
OPERATOR COMPUTER SR	OPERATOR KP I	OPERATOR KP II	OPERATOR UTILITY	OPERATOR TAB
OPERATOR EQUIPMENT D	OPERATOR MACHINE U R	OPERATOR COMPUTER	REPORTS CONTROL	STATISTICIAN
SUPERVISOR SHIFT	SUPERVISOR SHIFT ASS	SUPERVISOR	SUPERVISOR OPERATION	TAPE LIBRARIAN
TASK: 41 SORT CARDS				
ANALYST TRAFFIC	ANALYST CONTROL II	ANALYST CONTROL I	AUDITOR JR	CLERK I
CLERK ACCT III	CLERK TYPIST II	CLERK DP	CLERK JR	COORDINATOR DP
DATA CHECKER	DATA MATERIAL HANDLE	OPERATOR DP SR	OPERATOR DP	OPERATOR KP I
OPERATOR KP II	OPERATOR DATA RECORD	OPERATOR COMPUTER TR	OPERATOR TAB	OPERATOR MACHINE U R
OPERATOR COMPUTER II	OPERATOR DATA CONVER	OPERATOR KP	OPERATOR COMPUTER	PROGRAMMER OPERATOR
RECONCILIATOR PROOF	SECRETARY RECEPTIONI	SUPERVISOR SHIFT	SUPERVISOR	SUPERVISOR KP ASST
SUPERVISOR DP ASST	SUPERVISOR KP	TAPE LIBRARIAN		
TASK: 42 STORE FORMS OR CARDS				
CLERK STOCK II	CLERK TYPIST II	CLERK FILE	COORDINATOR	DATA CHECKER
DATA HANDLER	DESIGNER	MANAGER OPERATIONS	OPERATOR KP I	OPERATOR KP II
OPERATOR DATA RECORD	OPERATOR UTILITY	OPERATOR TAB	OPERATOR MACHINE DP	OPERATOR MACHINE U R
OPERATOR COMPUTER I	OPERATOR KP	OPERATOR COMPUTER	REPORTS CONTROL	SECRETARY
STOCKMAN	SUPERVISOR SHIFT	SUPERVISOR	SUPERVISOR WPC	SUPERVISOR OPERATION
TASK: 43 SUPERVISE PERSONNEL				
ADMINISTRATIVE ASST	ANALYST TECHNICIAN S	ANALYST SYSTEMS	ANALYST SYSTEMS SR	AUDITOR
COORDINATOR HOSPITAL	COORDINATOR DP	DIRECTOR ADM SYSTEMS	DIRECTOR	ENGINEER
GROUP LEADER	MANAGER OFFICE	MANAGER DP	MANAGER SOFTWARE SEC	MANAGER OPERATIONS
MANAGER DATA SERVICE	OPERATOR KP II	OPERATOR DATA CONVER	OPERATOR COMPUTER	PROGRAMMER II
SCHEDULER JOB	SUPERVISOR KP I	SUPERVISOR DATA PREP	SUPERVISOR PROGRAMMI	SUPERVISOR OP SYSTEM
SUPERVISOR	SUPERVISOR OP	SUPERVISOR SECTION	SUPERVISOR DATA CONT	SUPERVISOR OPERATION
SUPERVISOR KP				
TASK: 44 SYSTEM PREPARATION				
CLERK EDP CONTROL I	COORDINATOR DP	DATA HANDLER	MANAGER DP	OPERATOR EDP II
OPERATOR COMPUTER I	OPERATOR COMPUTER II	OPERATOR COMPUTER	PROGRAMMER ANALYST	SCHEDULER OPERATIONS
SCHEDULER JOB	TAPE LIBRARIAN	TECHNICIAN EDP I	TECHNICIAN EDP III	
TASK: 45 TAB, LIST CARDS				
OPERATOR DP SR	OPERATOR DP	OPERATOR UTILITY	OPERATOR COMPUTER TR	OPERATOR TAB
OPERATOR MACHINE U R	OPERATOR COMPUTER	TECHNICIAN DATA CONT		
TASK: 46 TAPE, CLEAN DRIVES				
OPERATOR COMPUTER SR	OPERATOR EDP II	OPERATOR COMPUTER I	OPERATOR COMPUTER	

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK: 47 TAPE, PREPARE LABELS				
CLERK CODING	CLERK FILE	COORDINATOR DP	DATA HANDLER	OPERATOR EDP II
OPERATOR MTST MTSC	OPERATOR UTILITY	OPERATOR TAB	OPERATOR COMPUTER I	OPERATOR KP
OPERATOR COMPUTER	PROGRAMMER II	SCHEDULER OPERATIONS	SCHEDULER JOB	STAGER
SUPERVISOR SHIFT	SUPERVISOR WPC	SUPERVISOR DP ASST	TAPEWRITER	
TASK: 48 TAPE, BUILD BACK UP				
DATA HANDLER	OPERATOR UTILITY	OPERATOR TAB	OPERATOR COMPUTER I	OPERATOR COMPUTER
PROGRAMMER OPERATOR	PROGRAMMER ANALYST	SUPERVISOR OPERATION	TECHNICIAN EDP I	
TASK: 49 TELEPHONING				
ACCOUNTANT	ANALYST SYSTEMS	ANALYST INV CTL	ANALYST RESEARCH OPE	AUDITOR
CLERK DATA CONTROL	CLERK RECORDS	CLERK I	CLERK ACCT II	CLERK TYPIST III
CLERK TYPIST II	CLERK STENO II	CLERK TYPIST I	CLERK CODING	CLERK CONTROL
CLERK FILE	CLERK SR	COORDINATOR CONTROL	COORDINATOR HOSPITAL	COORDINATOR DP
DATA CHECKER	DATA MATERIAL HANDLE	MANAGER ADM SERVICES	MANAGER	NURSE GENERAL III
OPERATOR KP I	OPERATOR KP II	OPERATOR BURSTER	OPERATOR KP LEAD	OPERATOR KP SR
OPERATOR COMPUTER I	OPERATOR COMPUTER II	OPERATOR DATA CONVER	OPERATOR KP	OPERATOR COMPUTER
PROGRAMMER ENGNR	REPORTS CONTROL	SECRETARY VERIFIER	SECRETARY OPERATOR K	SECRETARY
STAGER	STENOGRAPHER SR	SUPERVISOR SHIFT	SUPERVISOR KP I	SUPERVISOR DATA PREP
SUPERVISOR DP SYSTEM	SUPERVISOR	SUPERVISOR WPC	SUPERVISOR DP	SUPERVISOR DATA CONT
SUPERVISOR OPERATION	SUPERVISOR KP	TELECOM OPERATIONS S		
TASK: 50 TRAIN OPERATORS				
OPERATOR COMPUTER SR	OPERATOR KP II	OPERATOR COMPUTER II	OPERATOR MASTER	OPERATOR DATA CONVER
OPERATOR KP	OPERATOR COMPUTER	PROGRAMMER JR	SCHEDULER JOB	SUPERVISOR SHIFT
SUPERVISOR KP I	SUPERVISOR WPC	SUPERVISOR DP	SUPERVISOR DP ASST	SUPERVISOR KP
TASK: 51 UPDATE JOB CONTROL				
OPERATOR KP I	OPERATOR KP II	OPERATOR COMPUTER	PROGRAMMER I	PROGRAMMER ANALYST
SCHEDULER JOB				
TASK: 52 UPDATE FILES				
ACCOUNTANT	ANALYST SYSTEMS	CLERK CONTROL	MANAGER ADM SERVICES	NURSE GENERAL III
OPERATOR KP I	OPERATOR KP II	OPERATOR DATA RECORD	OPERATOR COMPUTER	PROGRAMMER I
PROGRAMMER SYSTEMS	PROGRAMMER ANALYST	SECRETARY	SUPERVISOR DP	SUPERVISOR DP ASST
TASK: 53 VERIFY DATA				
ANALYST CONTROL I	ANALYST INV CTL	CLERK I	CLERK CONTROL	CLERK CONTROL SET UP
CLERK DP	CLERK MAIL	COORDINATOR NURSING	METER READER	OPERATOR DP
OPERATOR KP I	OPERATOR MACHINE U R	OPERATOR COMPUTER I	OPERATOR KP	OPERATOR COMPUTER
PROCESSOR	SCHEDULER OPERATIONS	SUPERVISOR DATA CONT	SUPERVISOR KP	TAPEWRITER
TAPE LIBRARIAN	TECHNICIAN EDP III			

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK: 54 VERIFY OUTPUT VALIDI				
ACCOUNTANT	ANALYST TRAFFIC	ANALYST CONTROL II	ANALYST RESEARCH DP	AUDITOR
CLERK EDP CONTROL I	CLERK RECORDS	CLERK STATISTICAL	CLERK COST	CLERK I
CLERK ACCT III	CLERK ACCOUNTING	COORDINATOR BILLING	COORDINATOR HOSPITAL	DATA CHECKER
DATA MATERIAL HANDLE	DESIGNER	ENGINEER	EXPEDITER	MANAGER ADM SERVICES
MANAGER SYSTEMS PROG	OFFICER BUDGET CONTR	OPERATOR KP II	OPERATOR MACHINE U R	OPERATOR COMPUTER I
OPERATOR COMPUTER	PROCESSOR	PROGRAMMER II	PROGRAMMER I	PROGRAMMER LEAD
PROGRAMMER	REPORTS CONTROL	SECRETARY TRANS DATA	SECRETARY ACCTG DATA	STATISTICIAN
SUPERVISOR DP SYSTEM	SUPERVISOR	SUPERVISOR DP	SUPERVISOR DP ASST	SUPERVISOR OPERATION
TECHNICIAN EDP III	TELECOM OPERATIONS S			
TASK: 55 WIRE CONTROL PANELS				
DATA HANDLER	OPERATOR UTILITY	OPERATOR TAB	OPERATOR MACHINE U R	OPERATOR KP
OPERATOR COMPUTER	SUPERVISOR DP	SUPERVISOR OPERATION		
TASK: 56 WRITE NOTES				
OPERATOR COMPUTER I	OPERATOR KP	OPERATOR COMPUTER	SUPERVISOR OPERATION	
TASK: 57 WRITE MEMOS				
ANALYST TECHNICIAN S	ANALYST SYSTEMS III	ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST SYSTEMS I
AUDITOR	CLERK TYPIST II	CLERK STENO II	COORDINATOR NURSING	COORDINATOR HOSPITAL
COORDINATOR DP	DATA CHECKER	DIRECTOR	MANAGER ADM SERVICES	MANAGER DP
MANAGER SOFTWARE SEC	MANAGER OPERATIONS	OPERATOR COMPUTER SR	OPERATOR KP I	OPERATOR KP II
OPERATOR COMPUTER I	OPERATOR COMPUTER	PROGRAMMER SFTWRE AN	PROGRAMMER ANALYST	SCHEDULER OPERATIONS
SCHEDULER JOB	SECRETARY	STENOGRAPHER SR	SUPERVISOR SHIFT	SUPERVISOR DATA PREP
SUPERVISOR PROGRAMMI	SUPERVISOR DP	TELECOM OPERATIONS S		
TASK: 58 WRITE PROGRAMS				
ADMINISTRATIVE ASSIS	ANALYST TRAFFIC	ANALYST SYSTEMS III	ANALYST SYSTEMS I	ANALYST RESEARCH OPE
COORDINATOR DP ACCTG	COORDINATOR PROGRAM	COORDINATOR HOSPITAL	COORDINATOR DP	DATA HANDLER
DESIGNER	DIRECTOR ADM SYSTEMS	DIRECTOR DP	INSTRUCTOR	MANAGER DP
MANAGER PROGRAMMING	MANAGER OPERATIONS	NURSE GENERAL III	OPERATOR COMPUTER II	OPERATOR COMPUTER
PROGRAMMER III	PROGRAMMER TECHNICIA	PROGRAMMER ENGNR	PROGRAMMER JR	PROGRAMMER II
PROGRAMMER TRAINEE	PROGRAMMER I	PROGRAMMER LEAD	PROGRAMMER OPERATOR	PROGRAMMER SFTWRE AN
PROGRAMMER	PROGRAMMER SYSTEMS	PROGRAMMER ANALYST	SCHEDULER OPERATIONS	SECRETARY
SUPERVISOR PROGRAMMI	SUPERVISOR DP SYSTEM	SUPERVISOR DP		
TASK: 59 CHANGE RIBBON				
OPERATOR KP I	OPERATOR KP II	OPERATOR MTST MTSC	OPERATOR KP SR	OPERATOR KP
TASK: 60 CLERICAL WORK				
CLERK TRAFFIC ACCIDE	CLERK CONTROL	DATA CHECKER	OPERATOR KP I	OPERATOR DATA CONVER
OPERATOR KP	PROGRAMMER JR	SECRETARY	SUPERVISOR KP I	SUPERVISOR KP ASST
TASK: 61 CORRECT PROGRAMS				
COORDINATOR JOB STRE	OPERATOR KP	PROGRAMMER ENGNR	PROGRAMMER LEAD	PROGRAMMER
SUPERVISOR DP				
TASK: 62 DELIVER COMPUTER JOB				
ANALYST INV CTL	CLERK PRODUCTION REC	DATA CHECKER	DATA HANDLER	OPERATOR KP I
OPERATOR KP II	OPERATOR COMPUTER TR	OPERATOR KP	SCHEDULER OPERATIONS	STAGER
STOCKMAN				

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK: 63 DELIVER FORMS				
ANALYST TECHNICIAN S	ANALYST SYSTEMS SR	ANALYST CONTROL I	CLERK STOCK II	CLERK EDP CONTROL I
CLERK COST	CLERK TYPIST III	CLERK TYPIST II	CLERK STENO II	CLERK CONTROL
CLERK CONTROL SET UP	CLERK JR	ENGINEER	OPERATOR KP II	OPERATOR TAB
OPERATOR KP	PROGRAMMER II	SCHEDULER OPERATIONS	STENOGRAPHER SR	STOCKMAN
SUPERVISOR WPC	TELECOM OPERATIONS S			
TASK: 64 DESIGN DRUM CARD				
OPERATOR KP II	OPERATOR KP	SUPERVISOR KP ASST	SUPERVISOR KP	
TASK: 65 DISTRIBUTE WORK				
CLERK RECORDS	CLERK TYPIST III	CLERK TYPIST II	OPERATOR DATA CONVER	OPERATOR KP
TECHNICIAN DATA CONT				
TASK: 66 FOLLOW INSTRUCTIONS				
CLERK DP	DATA HANDLER	OPERATOR COMPUTER JR	OPERATOR COMPUTER I	OPERATOR KP
PROGRAMMER	TECHNICIAN EDP I			
TASK: 67 KEY TAPE				
OPERATOR KP	SUPERVISOR WPC	TAPEWRITER		
TASK: 68 KEYPUNCH DRUM CARD				
OPERATOR KP II	OPERATOR KP	SUPERVISOR KP		
TASK: 69 KEYPUNCH PROGRAMS				
CLERK ACCT III	CLERK ACCT II	CLERK JR	NURSE GENERAL III	OPERATOR DP SR
OPERATOR DP	OPERATOR KP I	OPERATOR KP SR	OPERATOR KP	PROGRAMMER LEAD
PROGRAMMER	SECRETARY OPERATOR K	SECRETARY	SUPERVISOR KP ASST	SUPERVISOR DP
TASK: 70 LOG PRODUCTION				
CLERK TYPIST II	OPERATOR KP	SUPERVISOR WPC	SUPERVISOR KP	
TASK: 71 MAIL, PREPARE				
CLERK PAYROLL	CLERK MAIL	CLERK JR	OPERATOR KP I	OPERATOR KP II
OPERATOR TAB	OPERATOR MACHINE U R	OPERATOR KP	SECRETARY RECEPTIONI	SECRETARY
SUPERVISOR	TECHNICIAN DATA CONT			
TASK: 72 MAIL, PROCESS				
CLERK INPUT OUTPUT	CLERK STENO II	CLERK FILE	CLERK MAIL	CLERK SPECIAL
CLERK JR	DATA CHECKER	MANAGER OFFICE	OPERATOR KP	SECRETARY RECEPTIONI
SECRETARY				
TASK: 73 MAIL, DISTRIBUTE				
CLERK EDP CONTROL I	CLERK STENO II	CLERK CONTROL SET UP	CLERK FILE	OPERATOR KP
SECRETARY OPERATOR K	STENOGRAPHER SR	STOCKMAN		
TASK: 74 MAIL, SORT				
CLERK I	CLERK TYPIST III	CLERK CONTROL SET UP	CLERK MAIL	MANAGER OFFICE
OPERATOR KP I	OPERATOR KP	SECRETARY RECEPTIONI	SECRETARY OPERATOR K	SECRETARY
TASK: 75 MAINTAIN FILES				
ADMINISTRATIVE ASST	CLERK CASHIER	DATA CHECKER	DATA MATERIAL HANDLE	MANAGER ADM SERVICES
OPERATOR DATA RECORD	OPERATOR KP	SCHEDULER OPERATIONS	SCHEDULER JOB	

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK: 76 RECEIVE SOURCE DOCUM				
CLERK SR	OPERATOR KP	SECRETARY RECEPTIONI	TECHNICIAN EDP III	
TASK: 77 RECEIVE CARDS				
CLERK DP	CLERK JR	OPERATOR TAB	OPERATOR KP	SUPERVISOR
TASK: 78 REFER TO FILES				
CLERK I	CLERK CODING	OPERATOR KP II	OPERATOR DATA RECORD	OPERATOR COMPUTER I
OPERATOR KP	PROGRAMMER ENGNR	SECRETARY RECEPTIONI	SECRETARY	STAGER
TASK: 79 RELIEVE SUPERVISOR				
OPERATOR COMPUTER SR	OPERATOR KP	SUPERVISOR WPC		
TASK: 80 RELIEVE EMPLOYEE				
CLERK TYPIST III	CLERK INPUT OUTPUT	CLERK SPECIAL	COORDINATOR NURSING	ENGINEER
OPERATOR COMPUTER II	OPERATOR KP	SUPERVISOR DATA PREP		
TASK: 81 REPRODUCE CARDS				
AUDITOR JR	CLERK FILE	DATA HANDLER	OPERATOR DP SR	OPERATOR DP
OPERATOR UTILITY	OPERATOR ENCODER	OPERATOR COMPUTER TR	OPERATOR TAB	OPERATOR MACHINE U R
OPERATOR COMPUTER II	OPERATOR KP			
TASK: 82 SEPARATE FORMS				
ANALYST INV CTL	CLERK EDP CONTROL I	CLERK COST	CLERK TYPIST II	CLERK PAYROLL
CLERK DP	OPERATOR KP			
TASK: 83 SPECIAL ASSIGNMENTS				
ADMINISTRATIVE ASST	ANALYST TRAFFIC SR	ANALYST TRAFFIC	ANALYST SYSTEMS	AUDITOR
CLERK SPECIAL	CLERK JR	COORDINATOR HOSPITAL	COORDINATOR DP	DATA MATERIAL HANDLE
DIRECTOR DP	MANAGER OPERATIONS	MANAGER DATA SERVICE	OPERATOR DP SR	OPERATOR DP
OPERATOR COMPUTER SR	OPERATOR KP II	OPERATOR DATA RECORD	OPERATOR COMPUTER I	OPERATOR KP
PROGRAMMER ENGNR	PROGRAMMER II	PROGRAMMER I	PROGRAMMER	PROGRAMMER ANALYST
SCHEDULER JOB	SECRETARY VERIFIER	SECRETARY	SUPERVISOR SHIFT	SUPERVISOR SECTION
SUPERVISOR DATA CONT	SYSTEMS DESIGNER			
TASK: 84 STAMP FORMS				
ANALYST CONTROL II	ANALYST CONTROL I	ANALYST INV CTL	CLERK EDP CONTROL I	CLERK TYPIST II
OPERATOR KP II	OPERATOR KP	SECRETARY	TAPE ENCODER	TECHNICIAN DATA CONT
TASK: 85 UPDATE INPUT DATA				
GROUP LEADER	OPERATOR KP I	OPERATOR KP II	OPERATOR KP	PROGRAMMER ENGNR
STATISTICIAN				
TASK: 86 UPDATE PROCEDURES				
ANALYST TRAFFIC	ANALYST SYSTEMS SR	AUDITOR	OPERATOR KP	SUPERVISOR DATA PREP
SUPERVISOR	SUPERVISOR DP	SUPERVISOR DATA CONT	SUPERVISOR OPERATION	

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK: 87 VERIFY KEYPUNCHED JO				
CLERK SPECIAL	OPERATOR KP I	OPERATOR KP II	OPERATOR VERIFIER	OPERATOR TAB
OPERATOR KP	SECRETARY VERIFIER			
TASK: 88 VERIFY INPUT DATA				
ACCOUNTANT	CLERK COST	DATA CHECKER	DETAILER SR	GROUP LEADER
OPERATOR DATA CONVER	OPERATOR KP	PROGRAMMER	SUPERVISOR KP I	SUPERVISOR
SUPERVISOR OPERATION				
TASK: 89 VERIFY CARDS				
ANALYST RESEARCH	ANALYST CONTROL II	ANALYST CONTROL I	OPERATOR DP SR	OPERATOR DP
OPERATOR I DP	OPERATOR KP I	OPERATOR DATA RECORD	OPERATOR VERIFIER	OPERATOR KP SR
OPERATOR DATA INPUT	OPERATOR COMPUTER I	OPERATOR DATA CONVER	OPERATOR KP	PROGRAMMER
SUPERVISOR KP ASST	SUPERVISOR KP			
TASK: 90 WRITE FORMS				
ACCOUNTANT	ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST SYSTEMS I	CLERK STATISTICAL
CLERK PRODUCTION REC	CLERK TYPIST III	CLERK TYPIST II	CLERK PAYROLL	COORDINATOR
COORDINATOR JOB STRE	DATA CHECKER	DIRECTOR DP	OPERATOR COMPUTER SR	OPERATOR KP I
OPERATOR MACHINE U R	OPERATOR KP	PROGRAMMER I	PROGRAMMER OPERATOR	STATISTICIAN
STOCKMAN	SUPERVISOR SECTION	SUPERVISOR DATA CONT	SUPERVISOR DP ASST	TAPE LIBRARIAN
TASK: 91 ASSIGN WORK				
ADMINISTRATIVE ASST	ADMINISTRATIVE ASSIS	ANALYST RESEARCH	ANALYST SYSTEMS III	ANALYST SYSTEMS II
ANALYST SYSTEMS	ANALYST SYSTEMS SR	CLERK CODING	COORDINATOR CONTROL	COORDINATOR HOSPITAL
COORDINATOR DP	COORDINATOR JOB STRE	ENGINEER	INSTRUCTOR	MANAGER ADM SERVICES
MANAGER SYSTEMS PROG	MANAGER SOFTWARE SEC	MANAGER PROGRAMMING	MANAGER OPERATIONS	MANAGER DATA SERVICE
OPERATOR KP II	OPERATOR DATA CONVER	PROGRAMMER ENGNR	PROGRAMMER II	PROGRAMMER ANALYST
SCHEDULER OPERATIONS	SECRETARY RECEPTIONI	STATISTICIAN	SUPERVISOR SHIFT	SUPERVISOR DATA PREP
SUPERVISOR SYSTEMS A	SUPERVISOR PROGRAMMI	SUPERVISOR	SUPERVISOR WPC	SUPERVISOR DP
SUPERVISOR DATA CONT	SUPERVISOR DP ASST	SUPERVISOR OPERATION	SUPERVISOR KP	
TASK: 92 DESIGN SYSTEMS				
ADMINISTRATIVE ASSIS	ANALYST SYSTEMS CHIE	ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST RESEARCH DP
AUDITOR	COORDINATOR DP	DIRECTOR ADM SYSTEMS	DIRECTOR DP	INSTRUCTOR
MANAGER DP	MANAGER DATA SERVICE	NURSE GENERAL III	OPERATOR MASTER	PROGRAMMER ENGNR
PROGRAMMER II	PROGRAMMER SFTWRE AN	PROGRAMMER	PROGRAMMER SYSTEMS	PROGRAMMER ANALYST
SUPERVISOR SYSTEMS A				
TASK: 93 ESTABLISH PRIORITIES				
COORDINATOR CONTROL	DIRECTOR	DIRECTOR DP	MANAGER SOFTWARE SEC	MANAGER OPERATIONS
MANAGER DATA SERVICE	SCHEDULER OPERATIONS	SUPERVISOR SHIFT	SUPERVISOR KP I	SUPERVISOR DATA PREP
SUPERVISOR PROGRAMMI	SUPERVISOR DATA CONT			

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK: 94 ANSWER QUESTIONS				
ACCOUNTANT	ADMINISTRATIVE ASST	ANALYST TRAFFIC SR	ANALYST TRAFFIC	AUDITOR
COORDINATOR DP	DESIGNER	DIRECTOR DP	ENGINEER	MANAGER
OPERATOR KP II	OPERATOR MTST MTSC	OPERATOR DATA CONVER	PROGRAMMER ENGNR	SECRETARY MTST MTSC
SUPERVISOR KP I	SUPERVISOR DP SYSTEM	SUPERVISOR	SUPERVISOR WPC	SUPERVISOR KP ASST
SUPERVISOR DP	SUPERVISOR KP			
TASK: 95 CONSULT SUPERVISORS				
ANALYST SYSTEMS III	ANALYST SYSTEMS SR	ANALYST SYSTEMS I	COORDINATOR HOSPITAL	INSTRUCTOR
MANAGER DP	MANAGER SOFTWARE SEC	MANAGER OPERATIONS	OPERATOR KP II	PROGRAMMER III
PROGRAMMER II	PROGRAMMER I	PROGRAMMER LEAD	SCHEDULER OPERATIONS	SUPERVISOR SHIFT
SUPERVISOR PROGRAMMI	SUPERVISOR DATA CONT	SUPERVISOR KP		
TASK: 96 CONSULT PROGRAMMERS				
ANALYST TRAFFIC	ANALYST INV CTL	DESIGNER	ENGINEER	MANAGER SYSTEMS PROG
PROGRAMMER II	PROGRAMMER ANALYST	SUPERVISOR SHIFT	SUPERVISOR PROGRAMMI	SUPERVISOR DP SYSTEM
SUPERVISOR	SUPERVISOR KP			
TASK: 97 CONSULT USERS				
ANALYST SYSTEMS III	ANALYST SYSTEMS II	ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST CONTROL I
ANALYST SYSTEMS I	COORDINATOR DP ACCTG	COORDINATOR DP	DIRECTOR	MANAGER SYSTEMS PROG
MANAGER DP	MANAGER OPERATIONS	NURSE GENERAL III	OPERATOR DP SR	OPERATOR DP
PROGRAMMER ENGNR	PROGRAMMER II	PROGRAMMER SFTWRE AN	PROGRAMMER	PROGRAMMER ANALYST
SUPERVISOR SHIFT	SUPERVISOR DP SYSTEM	SUPERVISOR KP		
TASK: 98 COUNSEL EMPLOYEES				
COORDINATOR HOSPITAL	SUPERVISOR DATA PREP	SUPERVISOR OPERATION	SUPERVISOR KP	
TASK: 99 DESIGN FORMS				
ANALYST SYSTEMS III	ANALYST SYSTEMS SR	ANALYST RESEARCH DP	CLERK STENO II	COORDINATOR CONTROL
COORDINATOR HOSPITAL	COORDINATOR DP	ENGINEER	MANAGER	MANAGER OPERATIONS
OPERATOR COMPUTER SR	PROGRAMMER	PROGRAMMER ANALYST	SUPERVISOR PROGRAMMI	SUPERVISOR DP SYSTEM
SUPERVISOR WPC	SUPERVISOR DP	SUPERVISOR KP		
TASK:100 EVALUATE EMPLOYEES				
ANALYST SYSTEMS III	ANALYST SYSTEMS SR	COORDINATOR CONTROL	COORDINATOR HOSPITAL	COORDINATOR DP
DIRECTOR DP	MANAGER SOFTWARE SEC	MANAGER OPERATIONS	PROGRAMMER II	SCHEDULER OPERATIONS
SUPERVISOR KP I	SUPERVISOR DATA PREP	SUPERVISOR SYSTEMS A	SUPERVISOR PROGRAMMI	SUPERVISOR
SUPERVISOR OP	SUPERVISOR DP ASST	SUPERVISOR OPERATION	SUPERVISOR KP	
TASK:101 FILE FORMS OR CARDS				
ANALYST CONTROL II	ANALYST CONTROL I	ANALYST INV CTL	AUDITOR JR	CLERK DATA CONTROL
CLERK TRAFFIC ACCIDE	CLERK TYPIST II	CLERK STENO II	CLERK FILE	CLERK JR
COORDINATOR DP	DATA CHECKER	OPERATOR KP I	OPERATOR KP II	OPERATOR MTST MTSC
OPERATOR COMPUTER TR	OPERATOR MACHINE U R	PROGRAMMER ENGNR	PROGRAMMER II	SCHEDULER OPERATIONS
SECRETARY VERIFIER	STAGER	SUPERVISOR KP I	SUPERVISOR	SUPERVISOR DATA CONT
SUPERVISOR KP	TAPE LIBRARIAN	TECHNICIAN DATA CONT		
TASK:102 INSTRUCT EMPLOYEES				
ANALYST SYSTEMS	OPERATOR KP II	OPERATOR KP LEAD	SUPERVISOR KP ASST	SUPERVISOR OPERATION
SUPERVISOR KP	TECHNICIAN EDP III			
TASK:103 INSTRUCT OPERATORS				
PROGRAMMER	PROGRAMMER ANALYST	SCHEDULER OPERATIONS	SUPERVISOR SHIFT	SUPERVISOR OPERATION
SUPERVISOR KP	TECHNICIAN EDP III			

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK#104 INTERVIEW APPLICANTS				
ANALYST SYSTEMS SR	DIRECTOR	DIRECTOR DP	MANAGER	MANAGER OPERATIONS
SUPERVISOR DATA PREP	SUPERVISOR DP	SUPERVISOR OPERATION	SUPERVISOR KP	
TASK#105 JOB ASSISTANCE				
ANALYST SYSTEMS II	ANALYST SYSTEMS	ANALYST INV CTL	ANALYST SYSTEMS I	CLERK DATA CONTROL
CLERK FILE	CLERK JR	COORDINATOR NURSING	COORDINATOR HOSPITAL	DATA MATERIAL HANDLE
DATA HANDLER	DESIGNER	ENGINEER	MANAGER DP	MANAGER OPERATIONS
NURSE GENERAL III	OFFICER BUDGET CONTR	OPERATOR KP II	OPERATOR MACHINE U R	OPERATOR COMPUTER I
OPERATOR COMPUTER II	OPERATOR MASTER	PROGRAMMER II	PROGRAMMER	SCHEDULER JOB
SECRETARY	SUPERVISOR DATA PREP	SUPERVISOR	SUPERVISOR DP	SUPERVISOR SECTION
SUPERVISOR OPERATION	SUPERVISOR KP	TECHNICIAN EDP III		
TASK#106 LOG WORK				
ANALYST SYSTEMS III	CLERK RECORDS	CLERK ACCT III	CLERK CONTROL	COORDINATOR CONTROL
DATA CHECKER	MANAGER SYSTEMS PROG	MANAGER PROGRAMMING	OPERATOR KP I	OPERATOR KP II
OPERATOR DATA INPUT	OPERATOR COMPUTER I	SCHEDULER OPERATIONS	SCHEDULER JOB	SECRETARY
SUPERVISOR KP ASST	SUPERVISOR DP	SUPERVISOR DATA CONT	SUPERVISOR DP ASST	SUPERVISOR OPERATION
SUPERVISOR KP				
TASK#107 READ				
ANALYST RESEARCH OPE	COORDINATOR NURSING	COORDINATOR HOSPITAL	PROGRAMMER	SUPERVISOR KP
TASK#108 RELAY INFORMATION				
ANALYST TECHNICIAN S	MANAGER OPERATIONS	OPERATOR COMPUTER I	OPERATOR COMPUTER II	PROGRAMMER III
PROGRAMMER II	SCHEDULER OPERATIONS	SECRETARY	SUPERVISOR KP I	SUPERVISOR DATA CONT
SUPERVISOR KP	TECHNICIAN EDP III			
TASK#109 REVIEW DOCUMENTATION				
ANALYST SYSTEMS III	ANALYST SYSTEMS II	ANALYST SYSTEMS	COORDINATOR PROGRAM	MANAGER SYSTEMS PROG
PROGRAMMER II	PROGRAMMER	SUPERVISOR DATA PREP	SUPERVISOR SYSTEMS A	SUPERVISOR PROGRAMMI
SUPERVISOR KP	TAPE LIBRARIAN			
TASK#110 SELECT PERSONNEL				
COORDINATOR DP	MANAGER	MANAGER DP	MANAGER OPERATIONS	SUPERVISOR
SUPERVISOR OPERATION	SUPERVISOR KP			
TASK#111 STUDY				
ANALYST SYSTEMS CHIE	ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST RESEARCH OPE	ANALYST RESEARCH DP
DIRECTOR ADM SYSTEMS	ENGINEER	OPERATOR UTILITY	PROGRAMMER III	PROGRAMMER TECHNICIA
PROGRAMMER ENGNR	PROGRAMMER I	PROGRAMMER	SUPERVISOR KP	SYSTEMS DESIGNER
TASK#112 TRACE ERRORS				
ANALYST CONTROL II	ANALYST INV CTL	ANALYST RESEARCH DP	AUDITOR	CLERK CONTROL
COORDINATOR DP	OPERATOR KP I	OPERATOR KP II	OPERATOR CRT DATA AN	OPERATOR COMPUTER II
OPERATOR MASTER	PROGRAMMER OPERATOR	SUPERVISOR DP SYSTEM	SUPERVISOR DATA CONT	SUPERVISOR DP ASST
SUPERVISOR KP	SYSTEMS DESIGNER			

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:113 TRAIN EMPLOYEES				
ANALYST TECHNICIAN S	ANALYST CONTROL II	COORDINATOR DP ACCTG	COORDINATOR HOSPITAL	COORDINATOR DP
DESIGNER	PROGRAMMER ENGNR	SUPERVISOR DATA PREP	SUPERVISOR KP	SYSTEMS DESIGNER
TECHNICIAN EDP III				
TASK:114 UPDATE MANUALS				
COORDINATOR DP ACCTG	COORDINATOR HOSPITAL	ENGINEER	MANAGER OPERATIONS	NURSE GENERAL III
OPERATOR KP I	OPERATOR KP II	PROGRAMMER ANALYST	SECRETARY RECEPTIONI	STENOGRAPHER SR
SUPERVISOR KP I	SUPERVISOR KP	TELECOM OPERATIONS S		
TASK:115 VERIFY WORK QUALITY				
ANALYST SYSTEMS SR	ANALYST SYSTEMS I	DESIGNER	MANAGER SYSTEMS PROG	OPERATOR DATA INPUT
OPERATOR MASTER	PROGRAMMER ENGNR	SUPERVISOR DATA PREP	SUPERVISOR DP	SUPERVISOR KP
TASK:116 WRITE INSTRUCTIONS				
COORDINATOR DP	PROGRAMMER ENGNR	PROGRAMMER II	PROGRAMMER I	PROGRAMMER LEAD
PROGRAMMER SFTWRE AN	PROGRAMMER	PROGRAMMER ANALYST	SCHEDULER OPERATIONS	SUPERVISOR DP SYSTEM
SUPERVISOR KP	TELECOM OPERATIONS S			
TASK:117 COMMUNICATION, VERBA				
ANALYST CONTROL II	ANALYST RESEARCH DP	COORDINATOR DP	DIRECTOR DP	ENGINEER
MANAGER PROGRAMMING	MANAGER OPERATIONS	OPERATOR MASTER	PROGRAMMER II	SCHEDULER JOB
SUPERVISOR KP I	SUPERVISOR SECTION	SUPERVISOR DATA CONT	TECHNICIAN EDP III	TELECOM OPERATIONS S
TASK:118 DOCUMENT SYSTEMS				
ANALYST SYSTEMS III	ANALYST SYSTEMS II	ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST SYSTEMS I
ANALYST RESEARCH DP	OPERATOR KP I	PROGRAMMER III	PROGRAMMER II	PROGRAMMER I
PROGRAMMER	PROGRAMMER ANALYST	SUPERVISOR DP SYSTEM		
TASK:119 WRITE LETTERS				
ANALYST SYSTEMS SR	ANALYST RESEARCH DP	AUDITOR	CLERK STENO II	COORDINATOR HOSPITAL
ENGINEER	MANAGER ADM SERVICES	PROGRAMMER ENGNR	PROGRAMMER II	PROGRAMMER
PROGRAMMER ANALYST	SCHEDULER OPERATIONS			
TASK:120 WRITE REPORTS				
ANALYST SYSTEMS SR	ANALYST RESEARCH DP	COORDINATOR HOSPITAL	MANAGER OPERATIONS	PROCESSOR PLANS
PROGRAMMER ANALYST	SUPERVISOR	SUPERVISOR DATA CONT	SUPERVISOR OPERATION	
TASK:121 ANALYZE PROGRAMS				
ANALYST SYSTEMS II	ANALYST SYSTEMS	ANALYST RESEARCH OPE	PROGRAMMER ANALYST	
TASK:122 ANALYZE SYSTEMS				
ADMINISTRATIVE ASSIS	ANALYST SYSTEMS II	ANALYST SYSTEMS	ANALYST SYSTEMS SR	COORDINATOR DP
INSTRUCTOR	MANAGER DP	PROGRAMMER ENGNR	PROGRAMMER ANALYST	SUPERVISOR DP
TASK:123 ASSIST ANALYSTS				
ANALYST SYSTEMS SR	PROGRAMMER ANALYST	SUPERVISOR SYSTEMS A		

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:124 ASSIST PROGRAMMERS				
ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST CONTROL II	ANALYST INV CTL	ANALYST SYSTEMS I
ANALYST RESEARCH OPE	COORDINATOR PROGRAM	DESIGNER	MANAGER SYSTEMS PROG	OPERATOR DP SR
OPERATOR MASTER	PROGRAMMER III	PROGRAMMER ENGNR	PROGRAMMER II	PROGRAMMER SFTWRE AN
PROGRAMMER	PROGRAMMER SYSTEMS	PROGRAMMER ANALYST	SUPERVISOR DATA PREP	SUPERVISOR PROGRAMMI
SUPERVISOR DP				
TASK:125 ASSIST SUPERVISORS				
ANALYST SYSTEMS I	PROGRAMMER LEAD	PROGRAMMER ANALYST	SUPERVISOR OPERATION	
TASK:126 ASSIST USERS				
ADMINISTRATIVE ASSIS	ANALYST CONTROL II	COORDINATOR PROGRAM	COORDINATOR HOSPITAL	COORDINATOR DP
MANAGER ADM SERVICES	OPERATOR COMPUTER SR	OPERATOR COMPUTER II	PROGRAMMER III	PROGRAMMER ENGNR
PROGRAMMER II	PROGRAMMER ANALYST	SUPERVISOR SHIFT	TECHNICAL WRITER	
TASK:127 ATTEND MEETING				
ANALYST SYSTEMS CHIE	ANALYST SYSTEMS III	ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST CONTROL II
CLERK I	COORDINATOR NURSING	COORDINATOR HOSPITAL	COORDINATOR DP	DIRECTOR ADM SYSTEMS
DIRECTOR DP	ENGINEER	MANAGER ADM SERVICES	MANAGER	MANAGER DP
MANAGER PROGRAMMING	MANAGER OPERATIONS	NURSE GENERAL III	OPERATOR KP I	OPERATOR KP II
OPERATOR MASTER	OPERATOR DATA CONVER	PROGRAMMER III	PROGRAMMER ENGNR	PROGRAMMER II
PROGRAMMER TRAINEE	PROGRAMMER I	PROGRAMMER SFTWRE AN	PROGRAMMER	PROGRAMMER SYSTEMS
PROGRAMMER ANALYST	SCHEDULER OPERATIONS	SUPERVISOR KP I	SUPERVISOR DATA PREP	SUPERVISOR PROGRAMMI
SUPERVISOR SECTION	SUPERVISOR DATA CONT	TECHNICIAN EDP III		
TASK:128 CHANGE PROGRAMS				
ANALYST SYSTEMS	COORDINATOR PROGRAM	COORDINATOR DP	MANAGER PROGRAMMING	OPERATOR COMPUTER II
PROGRAMMER TECHNICIA	PROGRAMMER ENGNR	PROGRAMMER II	PROGRAMMER TRAINEE	PROGRAMMER I
PROGRAMMER OPERATOR	PROGRAMMER	PROGRAMMER ANALYST	SCHEDULER OPERATIONS	SUPERVISOR OPERATION
TASK:129 CHANGE SYSTEMS				
ANALYST SYSTEMS SR	ANALYST RESEARCH OPE	DIRECTOR ADM SYSTEMS	PROGRAMMER II	PROGRAMMER
PROGRAMMER ANALYST	SUPERVISOR DP SYSTEM			
TASK:130 CONSULT MANUFACTURER				
ANALYST SYSTEMS SR	CLERK STENO II	COORDINATOR HOSPITAL	DIRECTOR DP	PROGRAMMER TECHNICIA
PROGRAMMER ANALYST				
TASK:131 CONSULT ANALYSTS				
ANALYST SYSTEMS SR	PROGRAMMER II	PROGRAMMER ANALYST	SUPERVISOR PROGRAMMI	
TASK:132 DEBUG PROGRAMS				
ANALYST SYSTEMS	PROGRAMMER III	PROGRAMMER TECHNICIA	PROGRAMMER ENGNR	PROGRAMMER JR
PROGRAMMER II	PROGRAMMER TRAINEE	PROGRAMMER I	PROGRAMMER LEAD	PROGRAMMER OPERATOR
PROGRAMMER	PROGRAMMER ANALYST	SUPERVISOR PROGRAMMI	SUPERVISOR DP	
TASK:133 DEMONSTRATE COMPUTER				
CLERK DATA CONTROL	PROGRAMMER ANALYST			
TASK:134 DEVELOP EMPLOYEE TRA				
COORDINATOR HOSPITAL	COORDINATOR DP	PROGRAMMER ANALYST	SCHEDULER OPERATIONS	
TASK:135 DISK TO TAPE CONVERS				
OPERATOR DATA INPUT	PROGRAMMER ANALYST			

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:136 DOCUMENT PROGRAMS				
ANALYST SYSTEMS II	ANALYST SYSTEMS I	NURSE GENERAL III	PROGRAMMER III	PROGRAMMER TECHNICIA
PROGRAMMER ENGNR	PROGRAMMER JR	PROGRAMMER II	PROGRAMMER TRAINEE	PROGRAMMER I
PROGRAMMER LEAD	PROGRAMMER SFTWRE AN	PROGRAMMER	PROGRAMMER ANALYST	SUPERVISOR PROGRAMMI
TASK:137 DOCUMENT PROCEDURES				
ANALYST CONTROL II	ANALYST RESEARCH OPE	PROGRAMMER SFTWRE AN	PROGRAMMER ANALYST	SUPERVISOR DP
SUPERVISOR OPERATION	SYSTEMS DESIGNER			
TASK:138 EDUCATE SELF				
ANALYST SYSTEMS SR	COORDINATOR DP ACCTG	DIRECTOR	MANAGER SOFTWARE SEC	MANAGER OPERATIONS
OPERATOR COMPUTER II	PROGRAMMER SFTWRE AN	PROGRAMMER	PROGRAMMER SYSTEMS	PROGRAMMER ANALYST
SCHEDULER JOB	SYSTEMS DESIGNER	TELECOM OPERATIONS S		
TASK:139 EVALUATE SYSTEMS				
ANALYST SYSTEMS SR	MANAGER DP	OPERATOR MASTER	PROGRAMMER SFTWRE AN	PROGRAMMER ANALYST
TASK:140 FEASIBILITY STUDY				
ANALYST SYSTEMS I	AUDITOR	COORDINATOR DP ACCTG	COORDINATOR DP	DIRECTOR DP
MANAGER SYSTEMS PROG	PROGRAMMER SFTWRE AN	PROGRAMMER ANALYST		
TASK:141 FLOWCHART PROGRAMS				
PROGRAMMER III	PROGRAMMER TECHNICIA	PROGRAMMER ENGNR	PROGRAMMER II	PROGRAMMER I
PROGRAMMER	PROGRAMMER ANALYST	SUPERVISOR PROGRAMMI		
TASK:142 INSTRUCT USERS				
ANALYST SYSTEMS I	OPERATOR KP SR	PROGRAMMER ENGNR	PROGRAMMER ANALYST	
TASK:143 LOG COMPUTER TIME				
CLERK FILE	DATA HANDLER	NURSE GENERAL III	PROGRAMMER ENGNR	PROGRAMMER
PROGRAMMER ANALYST	RECONCILIATOR PROOF	STAGER	STATISTICIAN	SUPERVISOR OPERATION
TASK:144 MAINTAIN LIBRARY				
CLERK CONTROL	PROGRAMMER ANALYST	TECHNICAL WRITER		
TASK:145 PLAN SYSTEMS				
COORDINATOR DP ACCTG	PROGRAMMER ANALYST	SUPERVISOR SYSTEMS A		
TASK:146 STUDY SYSTEMS				
MANAGER DP	PROGRAMMER ANALYST			
TASK:147 TEACH CLASS				
INSTRUCTOR	MANAGER	PROGRAMMER ANALYST	TEACHER	
TASK:148 TEST SYSTEMS				
ANALYST SYSTEMS CHIE	ANALYST SYSTEMS II	ANALYST SYSTEMS	DIRECTOR ADM SYSTEMS	PROGRAMMER SYSTEMS
PROGRAMMER ANALYST	SUPERVISOR DP SYSTEM			

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:149 TEST PROGRAMS				
ANALYST SYSTEMS II	ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST SYSTEMS I	ANALYST RESEARCH OPE
COORDINATOR DP ACCTG	MANAGER PROGRAMMING	OPERATOR COMPUTER JR	OPERATOR COMPUTER II	PROGRAMMER III
PROGRAMMER TECHNICIA	PROGRAMMER ENGNR	PROGRAMMER JR	PROGRAMMER II	PROGRAMMER TRAINEE
PROGRAMMER I	PROGRAMMER LEAD	PROGRAMMER SFTWRE AN	PROGRAMMER	PROGRAMMER SYSTEMS
PROGRAMMER ANALYST	SCHEDULER JOB	SUPERVISOR PROGRAMMI	SUPERVISOR DP SYSTEM	SUPERVISOR SECTION
SYSTEMS DESIGNER	TECHNICIAN EDP II			
TASK:150 UPDATE LIBRARY				
ANALYST TRAFFIC	ANALYST SYSTEMS	CLERK TYPIST III	CLERK CODING	COORDINATOR DP ACCTG
PROGRAMMER ENGNR	PROGRAMMER SFTWRE AN	PROGRAMMER SYSTEMS	PROGRAMMER ANALYST	SUPERVISOR SHIFT
TAPE LIBRARIAN	TECHNICAL WRITER			
TASK:151 WRITE MANUALS				
ANALYST SYSTEMS	ANALYST SYSTEMS SR	COORDINATOR DP ACCTG	DESIGNER	MANAGER SYSTEMS PROG
MANAGER	OPERATOR MACHINE U R	PROGRAMMER ANALYST		
TASK:152 COLLECT DATA				
ACCOUNTANT II	ANALYST CONTROL II	ANALYST CONTROL I	CLERK EDP CONTROL I	CLERK RECORDS
CLERK TYPIST I	COORDINATOR BILLING	COORDINATOR NURSING	MANAGER DP	NURSE GENERAL III
OFFICER BUDGET CONTR	PROGRAMMER II	REPORTS CONTROL	TECHNICIAN EDP III	
TASK:153 DELIVER DATA				
CLERK MAIL	COORDINATOR NURSING	OPERATOR MASTER	REPORTS CONTROL	SUPERVISOR SHIFT ASS
TASK:154 FILE REPORTS				
ANALYST TECHNICIAN S	CLERK TRAFFIC ACCIDE	CLERK PAYROLL	CLERK CONTROL	CLERK DP
REPORTS CONTROL	SUPERVISOR DATA CONT	SUPERVISOR OPERATION		
TASK:155 LOG TOTALS				
OPERATOR ENCODER	REPORTS CONTROL			
TASK:156 SCHEDULE COMPUTER TI				
ANALYST SYSTEMS II	ANALYST SYSTEMS SR	MANAGER OPERATIONS	OPERATOR COMPUTER TR	OPERATOR MASTER
PROGRAMMER II	PROGRAMMER I	PROGRAMMER	REPORTS CONTROL	SCHEDULER OPERATIONS
SUPERVISOR SHIFT	SUPERVISOR	SUPERVISOR SECTION	SUPERVISOR OPERATION	
TASK:157 XEROXING				
CLERK EDP CONTROL I	CLERK TRAFFIC ACCIDE	CLERK CONTROL	CLERK FILE	OPERATOR KP I
OPERATOR KP II	REPORTS CONTROL	SECRETARY VERIFIER	SECRETARY RECEPTIONI	SECRETARY
STENOGRAPHER SR				
TASK:158 DEVELOP PROCEDURES				
ANALYST SYSTEMS SR	AUDITOR	CLERK I	ENGINEER	MANAGER OPERATIONS
PROGRAMMER JR	PROGRAMMER SFTWRE AN	PROGRAMMER	SUPERVISOR PROGRAMMI	SUPERVISOR OPERATION
SYSTEMS DESIGNER				
TASK:159 ENCODE TAPE				
SUPERVISOR OPERATION	TAPE ENCODER			
TASK:160 ENFORCE POLICIES				
ANALYST SYSTEMS SR	MANAGER OPERATIONS	SCHEDULER OPERATIONS	SUPERVISOR SHIFT	SUPERVISOR OPERATION

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:161 FILE TAPES				
CLERK STATISTICAL	DATA HANDLER	OPERATOR COMPUTER SR	OPERATOR COMPUTER TR	SCHEDULER OPERATIONS
SUPERVISOR DATA PREP	SUPERVISOR DATA CONT	SUPERVISOR DP ASST	SUPERVISOR OPERATION	TAPE LIBRARIAN
TASK:162 INVENTORY SUPPLIES				
ADMINISTRATIVE ASST	AUDITOR	CLERK STOCK II	CLERK TYPIST II	CLERK DP
COORDINATOR CONTROL	NURSE GENERAL III	OPERATOR KP II	SECRETARY RECEPTIONI	SECRETARY
STENOGRAPHER SR	SUPERVISOR SHIFT	SUPERVISOR DP	SUPERVISOR OPERATION	
TASK:163 LABELING				
CLERK PAYROLL	CLERK FILE	OPERATOR KP I	OPERATOR MACHINE U R	SUPERVISOR OPERATION
TASK:164 LIAISON				
ANALYST TRAFFIC	ANALYST RESEARCH OPE	CLERK I	COORDINATOR CONTROL	COORDINATOR PROGRAM
COORDINATOR HOSPITAL	COORDINATOR DP	DATA HANDLER	DIRECTOR DP	ENGINEER
MANAGER ADM SERVICES	MANAGER DP	MANAGER OPERATIONS	OPERATOR MASTER	PROGRAMMER ENGNR
PROGRAMMER II	SECRETARY RECEPTIONI	SECRETARY	SUPERVISOR DATA PREP	SUPERVISOR
SUPERVISOR OPERATION				
TASK:165 LOG				
CLERK TRAFFIC ACCIDE	CLERK TYPIST III	CLERK INPUT OUTPUT	CLERK CODING	CLERK SR
DATA CHECKER	MANAGER OPERATIONS	OPERATOR KP II	OPERATOR MTST MTSC	OPERATOR MACHINE U R
OPERATOR COMPUTER I	SECRETARY	SECRETARY MTST MTSC	SUPERVISOR	SUPERVISOR DP
SUPERVISOR DATA CONT	SUPERVISOR OPERATION	TECHNICIAN DATA CONT		
TASK:166 MONITOR EQUIPMENT				
OPERATOR COMPUTER I	SUPERVISOR DATA PREP	SUPERVISOR DP ASST	SUPERVISOR OPERATION	TAPE LIBRARIAN
TASK:167 MONITORING				
ANALYST SYSTEMS SR	COORDINATOR ASST	COORDINATOR DP	DESIGNER	MANAGER OPERATIONS
OPERATOR COMPUTER I	OPERATOR COMPUTER II	SUPERVISOR OPERATION		
TASK:168 OPERATE CARD EQUIPME				
CLERK INPUT OUTPUT	DATA HANDLER	SUPERVISOR DP	SUPERVISOR OPERATION	
TASK:169 PRINTER, CUT LOOPS				
CLERK FILE	SUPERVISOR OPERATION			
TASK:170 REVIEWING				
PROCESSOR PLANS	SUPERVISOR	SUPERVISOR OPERATION		
TASK:171 SCHEDULE MAINTENANCE				
ANALYST SYSTEMS SR	SCHEDULER OPERATIONS	SUPERVISOR OPERATION		
TASK:172 SCHEDULING				
ANALYST SYSTEMS	COORDINATOR DP ACCTG	MANAGER SYSTEMS PROG	SCHEDULER OPERATIONS	SUPERVISOR SHIFT
SUPERVISOR DATA PREP	SUPERVISOR OPERATION			
TASK:173 SUPERVISE OPERATIONS				
COORDINATOR	COORDINATOR HOSPITAL	DIRECTOR DP	ENGINEER	MANAGER DP
MANAGER OPERATIONS	SUPERVISOR	SUPERVISOR DP	SUPERVISOR OPERATION	

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:174 TAPE, TEST				
SUPERVISOR OPERATION	TAPE LIBRARIAN			
TASK:175 TELEPROCESSING				
DATA HANDLER	OPERATOR EDP II	SUPERVISOR OPERATION	TECHNICIAN EDP II	
TASK:176 TRANSFER DATA				
ANALYST INV CTL	AUDITOR	CLERK EDP CONTROL I	CLERK CODING	OPERATOR COMPUTER TR
SECRETARY	SUPERVISOR DATA CONT	SUPERVISOR OPERATION	TECHNICIAN DATA CONT	
TASK:177 ANALYZING				
ANALYST RESEARCH OPE	AUDITOR	CLERK TRAFFIC ACCIDE	COORDINATOR HOSPITAL	COORDINATOR DP
MANAGER DP	MANAGER OPERATIONS	OPERATOR MASTER	PROGRAMMER JR	PROGRAMMER
SUPERVISOR PROGRAMMI	SYSTEMS DESIGNER			
TASK:178 CORRECT MALFUNCTION				
ANALYST RESEARCH OPE	OPERATOR COMPUTER TR	PROGRAMMER SFTWRE AN		
TASK:179 DESIGN FILES				
ANALYST RESEARCH OPE	COORDINATOR DP	MANAGER OPERATIONS	PROGRAMMER III	PROGRAMMER JR
PROGRAMMER	STATISTICIAN			
TASK:180 DEVELOP PROGRAMS				
ADMINISTRATIVE ASSIS	ANALYST RESEARCH OPE	DESIGNER	ENGINEER	PROGRAMMER TECHNICIA
PROGRAMMER I	PROGRAMMER LEAD	PROGRAMMER	SCHEDULER OPERATIONS	
TASK:181 PLANNING				
ANALYST TECHNICIAN S	ANALYST RESEARCH OPE	COORDINATOR DP	DETAILER	DETAILER SR
ENGINEER	MANAGER DP	MANAGER PROGRAMMING	OPERATOR DATA CONVER	PROGRAMMER III
PROGRAMMER ENGNR	SECRETARY RECEPTIONI	SUPERVISOR	SUPERVISOR DATA CONT	TECHNICIAN EDP III
TASK:182 SOLVE PROBLEMS				
ANALYST SYSTEMS	ANALYST RESEARCH OPE	COORDINATOR DP ACCTG	COORDINATOR HOSPITAL	DIRECTOR ADM SYSTEMS
DIRECTOR DP	MANAGER DP	OPERATOR COMPUTER I	PROGRAMMER ENGNR	SUPERVISOR SECTION
TASK:183 TRACE MALFUNCTION				
ANALYST RESEARCH OPE	COORDINATOR CONTROL	DIRECTOR ADM SYSTEMS	DIRECTOR	PROGRAMMER SFTWRE AN
TASK:184 WRITE PROGRAMS, SPEC				
ANALYST SYSTEMS CHIE	ANALYST SYSTEMS	ANALYST SYSTEMS I	ANALYST RESEARCH OPE	CLERK I
CLERK TYPIST II	CLERK TYPIST I	COORDINATOR HOSPITAL	COORDINATOR DP	DATA CHECKER
NURSE GENERAL III	OPERATOR KP I	OPERATOR KP II	PROGRAMMER ENGNR	
TASK:185 WRITE USER GUIDE				
ANALYST SYSTEMS	ANALYST SYSTEMS I	ANALYST RESEARCH OPE	COORDINATOR HOSPITAL	PROGRAMMER JR
TECHNICAL WRITER	TELECOM OPERATIONS S			

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:186 ANSWER USER QUESTION				
ADMINISTRATIVE ASSIS	ANALYST INV CTL	ANALYST SYSTEMS I	MANAGER PROGRAMMING	OPERATOR COMPUTER SR
PROGRAMMER III	PROGRAMMER	SECRETARY		
TASK:187 CONSULT MANAGEMENT				
ANALYST TECHNICIAN S	ANALYST SYSTEMS I	AUDITOR	COORDINATOR HOSPITAL	COORDINATOR DP
MANAGER ADM SERVICES	MANAGER SOFTWARE SEC	PROGRAMMER	SYSTEMS DESIGNER	TECHNICIAN EDP III
TASK:188 DESIGN JOB CONTROL				
ANALYST SYSTEMS I	CLERK TYPIST I	TECHNICIAN EDP III		
TASK:189 DESIGN OUTPUT FORMAT				
ANALYST RESEARCH	ANALYST SYSTEMS II	ANALYST SYSTEMS I	PROGRAMMER III	PROGRAMMER
SECRETARY MTST MTSC				
TASK:190 DESIGN INPUT FORMATS				
ANALYST SYSTEMS II	ANALYST SYSTEMS I	PROGRAMMER III	PROGRAMMER	
TASK:191 DISTRIBUTE OUTPUT				
ANALYST SYSTEMS I	AUDITOR	CLERK DATA CONTROL	CLERK I	CLERK TYPIST III
CLERK TYPIST II	CLERK TYPIST I	CLERK CONTROL	CLERK JR	COORDINATOR
COORDINATOR HOSPITAL	COORDINATOR DP	OPERATOR COMPUTER SR	OPERATOR KP I	OPERATOR KP II
OPERATOR COMPUTER JR	OPERATOR COMPUTER I	PROGRAMMER II	STAGER	STATISTICIAN
STOCKMAN	SUPERVISOR SHIFT	SUPERVISOR	SUPERVISOR DP	TECHNICIAN DATA CONT
TASK:192 FLOWCHART SYSTEMS				
ANALYST SYSTEMS III	ANALYST SYSTEMS I	PROGRAMMER III	PROGRAMMER II	
TASK:193 OPERATE COMPUTER				
ANALYST TRAFFIC	ANALYST SYSTEMS III	ANALYST SYSTEMS II	ANALYST SYSTEMS I	MANAGER DP
MANAGER OPERATIONS	OPERATOR COMPUTER I	OPERATOR COMPUTER II	SCHEDULER OPERATIONS	SUPERVISOR PROGRAMMI
SUPERVISOR DP SYSTEM				
TASK:194 REVIEW SYSTEMS				
ANALYST TECHNICIAN S	ANALYST SYSTEMS III	ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST SYSTEMS I
AUDITOR	COORDINATOR PROGRAM	DIRECTOR	MANAGER SYSTEMS PROG	PROGRAMMER JR
SUPERVISOR PROGRAMMI	SUPERVISOR DP SYSTEM			
TASK:195 UPDATE SYSTEMS				
ANALYST SYSTEMS SR	ANALYST SYSTEMS I	COORDINATOR HOSPITAL	MANAGER SYSTEMS PROG	MANAGER OPERATIONS
PROCESSOR	PROGRAMMER TECHNICIA	SCHEDULER OPERATIONS		
TASK:196 VERIFICATION				
ANALYST SYSTEMS	ANALYST SYSTEMS SR	ANALYST INV CTL	ANALYST SYSTEMS I	DATA CHECKER
OPERATOR KP II	PROGRAMMER II	PROGRAMMER SFTWRE AN	TAPE ENCODER	
TASK:197 APPROVE DOCUMENTATIO				
ANALYST SYSTEMS	MANAGER OPERATIONS	SUPERVISOR SYSTEMS A	TAPE LIBRARIAN	

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:198 APPROVE PAYMENTS DATA MATERIAL HANDLE SUPERVISOR	MANAGER ADM SERVICES	MANAGER OPERATIONS	SECRETARY RECEPTIONI	SUPERVISOR DATA PREP
TASK:199 ATTEND SEMINAR MANAGER	MANAGER DP	MANAGER OPERATIONS	PROGRAMMER	
TASK:200 COORDINATE MAINTENAN MANAGER OPERATIONS	SUPERVISOR SECTION			
TASK:201 DESIGN FLOORPLAN DIRECTOR ADM SYSTEMS	DIRECTOR DP	MANAGER OPERATIONS		
TASK:202 LOG MANAGER OPERATIONS	OPERATOR MTST MTSC	SECRETARY MTST MTSC	SUPERVISOR DATA CONT	TECHNICIAN DATA CONT
TASK:203 PLAN WORK SCHEDULE MANAGER OPERATIONS	SUPERVISOR SHIFT			
TASK:204 PREPARE EMPLOYEE TRA ANALYST TECHNICIAN S	MANAGER OPERATIONS	PROGRAMMER SFTWRE AN	SUPERVISOR DATA PREP	SUPERVISOR SECTION
TASK:205 PREPARE BUDGET DIRECTOR MANAGER OPERATIONS	DIRECTOR DP	MANAGER	MANAGER DP	MANAGER SOFTWARE SEC
TASK:206 READ MANUALS ANALYST SYSTEMS SR PROGRAMMER SYSTEMS	MANAGER DP	MANAGER OPERATIONS	PROGRAMMER I	PROGRAMMER
TASK:207 RECEIVE TRAINING CLERK CONTROL	MANAGER OPERATIONS	OPERATOR DATA RECORD	SUPERVISOR WPC	SUPERVISOR DP
TASK:208 REVIEW REPORTS ANALYST TECHNICIAN S	ANALYST SYSTEMS	ENGINEER	MANAGER ADM SERVICES	MANAGER OPERATIONS
TASK:209 TECHNICAL ADVICE ENGINEER	MANAGER OPERATIONS	PROGRAMMER ENGNR	SYSTEMS DESIGNER	
TASK:210 TROUBLESHOOTING ANALYST SYSTEMS SR SUPERVISOR DATA PREP	MANAGER	MANAGER OPERATIONS	OPERATOR KP II	PROGRAMMER I
TASK:211 CHANGE JOB CONTROL SCHEDULER JOB	TECHNICIAN EDP III			
TASK:212 KEY DATA CLERK DATA CONTROL SCHEDULER JOB	CLERK TYPIST I	OPERATOR I DP	OPERATOR CRT DATA AN	OPERATOR DATA INPUT

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:213 MONITOR TERMINAL				
OPERATOR COMPUTER SR	OPERATOR COMPUTER I	SCHEDULER JOB		
TASK:214 RUN ERRANDS				
CLERK STENO II	OPERATOR DATA CONVER	SECRETARY		
TASK:215 ANSWERING SERVICE				
CLERK TYPIST III	SECRETARY RECEPTIONI	SUPERVISOR DP ASST		
TASK:216 SCRAP CARDS				
SUPERVISOR DP ASST	TECHNICIAN DATA CONT			
TASK:217 APPROVE PROGRAMS				
MANAGER PROGRAMMING	PROGRAMMER			
TASK:218 COMMUNICATION, VERBA				
DIRECTOR DP	MANAGER PROGRAMMING	SUPERVISOR SECTION		
TASK:219 COORDINATING				
ANALYST RESEARCH	ANALYST SYSTEMS SR	COORDINATOR HOSPITAL	ENGINEER	MANAGER DP
MANAGER PROGRAMMING	PROGRAMMER	SUPERVISOR SYSTEMS A		
TASK:220 DOCUMENTATION				
COORDINATOR DP ACCTG	COORDINATOR DP	DESIGNER	MANAGER PROGRAMMING	PROGRAMMER SFTWRE AN
PROGRAMMER	PROGRAMMER SYSTEMS			
TASK:221 REVIEW PROGRAMS				
ANALYST TRAFFIC	ANALYST SYSTEMS	DESIGNER	ENGINEER	GROUP LEADER
MANAGER PROGRAMMING	PROGRAMMER	SCHEDULER OPERATIONS		
TASK:222 COORDINATE SYSTEMS				
ANALYST TECHNICIAN S	ANALYST SYSTEMS III	ANALYST SYSTEMS SR	COORDINATOR HOSPITAL	DIRECTOR DP
MANAGER DP	PROGRAMMER TECHNICIA	PROGRAMMER		
TASK:223 FLOWCHART				
ANALYST SYSTEMS II	AUDITOR	OPERATOR KP I	PROGRAMMER I	PROGRAMMER SFTWRE AN
PROGRAMMER	STATISTICIAN	SYSTEMS DESIGNER		
TASK:224 RECOMMEND CHANGES				
ANALYST TECHNICIAN S	ANALYST SYSTEMS II	ANALYST SYSTEMS SR	AUDITOR	MANAGER SOFTWARE SEC
PROGRAMMER				
TASK:225 TAPE, MAINTAIN				
OPERATOR COMPUTER II	PROGRAMMER	TAPE LIBRARIAN		
TASK:226 TAPE, PRINT				
PROGRAMMER	TECHNICIAN EDP I			
TASK:227 UPDATE REPORTS				
CLERK DATA CONTROL	OPERATOR KP I	PROGRAMMER	SUPERVISOR	SUPERVISOR DP

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:228 CONSULT OPERATORS				
COORDINATOR HOSPITAL	OPERATOR KP II	SUPERVISOR DATA CONT		
TASK:229 EDIT REPORTS				
COORDINATOR HOSPITAL	ENGINEER	MANAGER ADM SERVICES	SUPERVISOR DATA CONT	
TASK:230 FILE OUTPUT				
ANALYST SYSTEMS	ANALYST CONTROL II	CLERK VERIFICATION	EXPEDITER	OPERATOR KP II
STAGER	STATISTICIAN	SUPERVISOR DATA CONT		
TASK:231 SUPERVISING				
ADMINISTRATIVE ASSIS	COORDINATOR PROGRAM	COORDINATOR HOSPITAL	COORDINATOR DP	ENGINEER
MANAGER ADM SERVICES	MANAGER SOFTWARE SEC	SCHEDULER OPERATIONS	SUPERVISOR	SUPERVISOR DP
SUPERVISOR DATA CONT	TECHNICAL WRITER			
TASK:232 EDIT FORMS				
AUDITOR	CLERK TYPIST II	CLERK STENO II	CLERK TYPIST I	DATA HANDLER
OPERATOR KP I	TECHNICAL WRITER	TECHNICIAN DATA CONT		
TASK:233 LOG DATA FLOW				
CLERK COST	TECHNICIAN DATA CONT			
TASK:234 SORT OUTPUT				
ACCOUNTANT	ANALYST CONTROL II	CLERK VERIFICATION	TECHNICIAN DATA CONT	
TASK:235 RECEIVE INSTRUCTIONS				
PROGRAMMER III	SUPERVISOR KP I	SUPERVISOR SECTION	TECHNICIAN EDP III	
TASK:236 WRITE JOB DESCRIPTIO				
COORDINATOR HOSPITAL	SUPERVISOR DP	SUPERVISOR SECTION		
TASK:237 ANALYZE PROBLEMS				
DIRECTOR	OPERATOR MASTER	PROGRAMMER SFTWRE AN	SUPERVISOR DP SYSTEM	
TASK:238 ANALYZING				
OPERATOR MASTER	SYSTEMS DESIGNER			
TASK:239 CONDUCT IN SERVICE T				
COORDINATOR NURSING	SCHEDULER OPERATIONS			
TASK:240 FILE				
CLERK TRAFFIC ACCIDE	CLERK TYPIST III	CLERK CODING	COORDINATOR HOSPITAL	GROUP LEADER
OPERATOR KP II	OPERATOR TAB	SCHEDULER OPERATIONS	SECRETARY RECEPTIONI	SECRETARY
STENOGRAPHER SR				
TASK:241 REPLENISH SUPPLIES				
CLERK STOCK II	CLERK TRAFFIC ACCIDE	OPERATOR EDP II	OPERATOR MACHINE DP	PROGRAMMER OPERATOR
SCHEDULER OPERATIONS	SUPERVISOR WPC	TECHNICIAN EDP I	TECHNICIAN EDP II	
TASK:242 REVIEW PROCEDURES				
AUDITOR	ENGINEER	OPERATOR KP II	SCHEDULER OPERATIONS	TELECOM OPERATIONS S

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:243 TAPE, RELEASE					
SCHEDULER OPERATIONS	TAPEWRITER				
TASK:244 DISK, MOUNT					
COORDINATOR JOB STRE	OPERATOR EDP II	OPERATOR COMPUTER I	OPERATOR COMPUTER II	SUPERVISOR SHIFT	
TASK:245 REVIEW OPERATIONS					
ANALYST SYSTEMS SR	COORDINATOR JOB STRE	MANAGER DP			
TASK:246 TAKE TURN OVER					
COORDINATOR JOB STRE	OPERATOR COMPUTER SR	OPERATOR EQUIPMENT D	OPERATOR MACHINE U R	OPERATOR COMPUTER II	
TASK:247 MAINTAIN SECURITY					
COORDINATOR HOSPITAL	OPERATOR COMPUTER SR	OPERATOR COMPUTER I	OPERATOR COMPUTER II	SUPERVISOR SHIFT ASS	
TASK:248 TAPE, FILE					
OPERATOR UTILITY	OPERATOR TAB	OPERATOR COMPUTER II	SUPERVISOR SHIFT ASS		
TASK:249 TAPE, MOUNT					
OPERATOR EDP II	OPERATOR COMPUTER JR	OPERATOR KP SR	OPERATOR DATA INPUT	OPERATOR COMPUTER I	
OPERATOR COMPUTER II	SUPERVISOR SHIFT				
TASK:250 CLEAR CARD JAMS					
OPERATOR COMPUTER I	SUPERVISOR SHIFT				
TASK:251 DISK, PREPARE LABELS					
OPERATOR COMPUTER I	PROGRAMMER II	SUPERVISOR SHIFT			
TASK:252 LOG MALFUNCTIONS					
OPERATOR COMPUTER I	SUPERVISOR SHIFT	SUPERVISOR WPC	TECHNICIAN EDP III		
TASK:253 MOVE CARDS OR FORMS					
CLERK STOCK II	CLERK CONTROL	OPERATOR KP I	OPERATOR TAB	OPERATOR MACHINE DP	
OPERATOR COMPUTER I	STOCKMAN	SUPERVISOR SHIFT ASS	TAPE LIBRARIAN		
TASK:254 MOVE TAPES					
CLERK TYPIST III	OPERATOR TAB	OPERATOR COMPUTER I	STAGER	SUPERVISOR WPC	
TAPE LIBRARIAN					
TASK:255 TYPE REPORTS					
CLERK CASHIER	OPERATOR COMPUTER I	STENOGRAPHER SR			
TASK:256 CONSULT COORDINATORS					
DIRECTOR ADM SYSTEMS	STAGER				
TASK:257 MICROFILMING					
CLERK CONTROL SET UP	CLERK DP	CLERK MAIL	STAGER	SUPERVISOR WPC	

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:258 MICROFILMING					
CLERK DP	STAGER				
TASK:259 SEPARATE CARDS					
CLERK CONTROL	OPERATOR MACHINE U R	STAGER			
TASK:260 LOG TAPES					
OPERATOR MTST MTSC	SECRETARY VERIFIER	SUPERVISOR SHIFT	TAPE LIBRARIAN		
TASK:261 OPERATE PLOTTER					
ANALYST TRAFFIC	DATA CHECKER	OPERATOR COMPUTER SR	PROGRAMMER ENGNR	TAPE LIBRARIAN	
TASK:262 TAPE, CATALOG					
OPERATOR COMPUTER TR	TAPE LIBRARIAN				
TASK:263 TAPE, SCRATCH					
STATISTICIAN	TAPE LIBRARIAN				
TASK:264 TAPE, DISTRIBUTE					
COORDINATOR DP	OPERATOR COMPUTER TR	TAPE LIBRARIAN			
TASK:265 TAPE, STORE					
CLERK DP	TAPE LIBRARIAN				
TASK:266 TAPE, PREPARE					
DATA HANDLER	SUPERVISOR SHIFT ASS	TAPE LIBRARIAN			
TASK:267 UPDATE LOG					
OPERATOR KP I	SECRETARY OPERATOR K	SUPERVISOR SHIFT	SUPERVISOR DP	TAPE LIBRARIAN	
TASK:268 MONITOR SYSTEM					
OPERATOR COMPUTER JR	OPERATOR DATA INPUT				
TASK:269 SELECT PROGRAMS					
OPERATOR COMPUTER JR	OPERATOR DATA INPUT				
TASK:270 BOX CARDS					
CLERK FILE	OPERATOR TAB	OPERATOR MACHINE U R			
TASK:271 BUILD BACK UP					
OPERATOR KP II	OPERATOR MACHINE U R				
TASK:272 COLLATE FORMS					
CLERK TYPIST III	CLERK TYPIST II	OPERATOR MACHINE U R			
TASK:273 COLLATE CARDS					
AUDITOR JR	CLERK ACCT III	CLERK TYPIST III	CLERK JR	DATA CHECKER	
OPERATOR EDP II	OPERATOR TAB	OPERATOR MACHINE U R	PROGRAMMER OPERATOR		
TASK:274 OPERATE SYSTEM					
OPERATOR CRT DATA AN	OPERATOR MACHINE U R	SUPERVISOR SHIFT			

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:275 PROCESS REPORTS				
ANALYST INV CTL	CLERK TRAFFIC ACCIDE	OPERATOR MACHINE DP	OPERATOR EQUIPMENT O	
TASK:276 DISTRIBUTE SUPPLIES				
ADMINISTRATIVE ASST	CLERK STOCK II	CLERK INPUT OUTPUT	OPERATOR MACHINE DP	STOCKMAN
TASK:277 MOVE CARDS OR FORMS				
OPERATOR MACHINE DP	SUPERVISOR SHIFT ASS			
TASK:278 ANALYZE OUTPUT				
ANALYST RESEARCH	ANALYST TRAFFIC SR	ANALYST TRAFFIC	AUDITOR	ENGINEER
GROUP LEADER	STATISTICIAN			
TASK:279 CONDUCT MEETING				
ANALYST SYSTEMS CHIE	ANALYST TECHNICIAN S	ANALYST SYSTEMS	AUDITOR	COORDINATOR HOSPITAL
DIRECTOR DP	MANAGER	SUPERVISOR SYSTEMS A	SUPERVISOR	SUPERVISOR WPC
SYSTEMS DESIGNER	TELECOM OPERATIONS S			
TASK:280 COORDINATE OPERATION				
AUDITOR	COORDINATOR DP	INSTRUCTOR	SYSTEMS DESIGNER	
TASK:281 DESIGN INPUT FORMS				
ANALYST SYSTEMS SR	AUDITOR	PROGRAMMER ENGNR		
TASK:282 EDIT OUTPUT				
ACCOUNTANT	AUDITOR	CLERK TYPIST II	COORDINATOR ASST	COORDINATOR BILLING
EXPEDITER	PROGRAMMER II	SUPERVISOR		
TASK:283 PREPARE INPUT DATA				
ANALYST TRAFFIC	ANALYST CONTROL II	ANALYST CONTROL I	AUDITOR	COORDINATOR HOSPITAL
DATA CHECKER	DESIGNER	DETAILER	DETAILER SR	ENGINEER
GROUP LEADER	OPERATOR CRT DATA AN	PROCESSOR PLANS	PROGRAMMER I	SECRETARY
STATISTICIAN	SUPERVISOR SHIFT ASS			
TASK:284 PROCESS INPUT DATA				
AUDITOR	CLERK TRAFFIC ACCIDE	COORDINATOR ASST	OPERATOR KP I	STENOGRAPHER SR
SUPERVISOR				
TASK:285 PROCESS OUTPUT				
ACCOUNTANT	AUDITOR	BOOKKEEPER	CASHIER	CLERK TRAFFIC ACCIDE
CLERK COST	CLERK CASHIER	DETAILER SR	EXPEDITER	STATISTICIAN
SUPERVISOR				
TASK:286 TRAVEL				
ANALYST SYSTEMS SR	AUDITOR	ENGINEER	MANAGER DP	PROGRAMMER II
TASK:287 UPDATE OUTPUT				
AUDITOR	CLERK TYPIST III	COORDINATOR ASST	ENGINEER	MANAGER OFFICE
PSYCHIATRIC AIDE II				

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:288 CODE INPUT FORMS				
ACCOUNTANT	ANALYST CONTROL II	ANALYST CONTROL I	ANALYST INV CTL	CLERK I
CLERK STENO II	DATA CHECKER	ENGINEER	EXPEDITER	MANAGER OFFICE
OPERATOR KP I	OPERATOR KP II	SECRETARY TRANS DATA	SECRETARY ACCTG DATA	
TASK:289 MATCH DATA				
ACCOUNTANT	ANALYST INV CTL	CLERK COST	DATA CHECKER	EXPEDITER
SUPERVISOR				
TASK:290 RECEIVE OUTPUT				
ANALYST INV CTL	CLERK TYPIST II	COORDINATOR	MANAGER FOOD SERVICE	
TASK:291 TYPE LETTERS				
ANALYST INV CTL	CLERK CASHIER	CLERK TYPIST III	CLERK STENO II	OPERATOR MTST MTSC
SECRETARY				
TASK:292 CALCULATE				
ACCOUNTANT	ANALYST CONTROL II	ANALYST CONTROL I	CLERK DATA CONTROL	CLERK STATISTICAL
CLERK CONTROL SET UP	COORDINATOR DP	DESIGNER	OPERATOR MTST MTSC	OPERATOR ENCODER
PROGRAMMER ENGNR	SECRETARY MTST MTSC			
TASK:293 LOG BATCHES				
ANALYST CONTROL II	ANALYST CONTROL I	CLERK RECORDS	CLERK PRODUCTION REC	CLERK CONTROL
EXPEDITER	OPERATOR KP II			
TASK:294 POST				
ANALYST CONTROL II	ANALYST CONTROL I	CLERK CONTROL SET UP	CLERK DP	
TASK:295 TYPE				
ANALYST SYSTEMS	ANALYST CONTROL I	CLERK TYPIST II	OPERATOR DATA RECORD	SECRETARY VERIFIER
SECRETARY RECEPTIONI	SECRETARY OPERATOR K	SECRETARY	SECRETARY MTST MTSC	SUPERVISOR WPC
TASK:296 DISCUSS PROBLEMS				
ANALYST SYSTEMS SR	ANALYST CONTROL II	COORDINATOR HOSPITAL	DIRECTOR	
TASK:297 PREPARE USER GUIDE				
ANALYST SYSTEMS SR	ANALYST CONTROL II	CLERK ACCT II	SUPERVISOR	SUPERVISOR DP
TASK:298 SORT FORMS				
ANALYST CONTROL II	NURSE GENERAL III	OPERATOR KP I	OPERATOR KP LEAD	OPERATOR TAB
SECRETARY RECEPTIONI	STATISTICIAN	STENOGRAPHER SR	SUPERVISOR SHIFT ASS	SUPERVISOR WPC
TASK:299 ESTABLISH STANDARDS				
ANALYST SYSTEMS III	COORDINATOR DP	DIRECTOR DP	MANAGER SOFTWARE SEC	PROGRAMMER SFTWRE AN
SUPERVISOR SYSTEMS A	SUPERVISOR DP			
TASK:300 DESIGN CARD LAYOUTS				
COORDINATOR DP	INSTRUCTOR	OPERATOR DP SR	OPERATOR KP I	OPERATOR KP II
SUPERVISOR DP				
TASK:301 DESIGN FORMS				
ANALYST SYSTEMS III	COORDINATOR HOSPITAL	SUPERVISOR DP		

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:302 LOG ATTENDANCE				
ANALYST SYSTEMS III	CLERK STENO II	STENOGRAPHER SR	SUPERVISOR	SUPERVISOR WPC
SUPERVISOR DP				
TASK:303 RECEIVE SALESMEN				
ANALYST TECHNICIAN S	MANAGER DP	SUPERVISOR DP		
TASK:304 SUPERVISING				
MANAGER ADM SERVICES	SUPERVISOR DP	TECHNICAL WRITER		
TASK:305 TYPE MEMOS				
CLERK TYPIST III	CLERK STENO II	DATA MATERIAL HANDLE	OPERATOR MTST MTSC	SUPERVISOR DP
TASK:306 VERIFY PROGRAMS				
CLERK SPECIAL	DESIGNER			
TASK:307 DESIGN DATA FLOW				
COORDINATOR DP	MANAGER DP			
TASK:308 DEVELOP SYSTEMS				
MANAGER DP	SYSTEMS DESIGNER			
TASK:309 MAIL, PROCESS				
CLERK MAIL	SECRETARY RECEPTIONI			
TASK:310 MAIL, PREPARE				
CLERK PAYROLL	CLERK MAIL			
TASK:311 EVALUATING				
ANALYST SYSTEMS SR	COORDINATOR DP	DIRECTOR DP	OPERATOR KP I	SYSTEMS DESIGNER
TASK:312 OPERATE OFFICE EQUIP				
COORDINATOR DP	OPERATOR MTST MTSC	OPERATOR CRT DATA AN	SUPERVISOR WPC	
TASK:313 ORAL PRESENTATIONS				
ANALYST TECHNICIAN S	ANALYST SYSTEMS	ANALYST SYSTEMS SR	COORDINATOR HOSPITAL	COORDINATOR DP
DIRECTOR DP	ENGINEER	SUPERVISOR SYSTEMS A		
TASK:314 PROCESS CORRESPONDEN				
ACCOUNTANT	ADMINISTRATIVE ASSIS	ANALYST TRAFFIC SR	CLERK STENO II	COORDINATOR DP
DATA CHECKER	DIRECTOR	DIRECTOR DP	ENGINEER	OFFICER BUDGET CONTR
OPERATOR DATA RECORD	PROGRAMMER ENGNR	SECRETARY	SUPERVISOR	SUPERVISOR WPC
TASK:315 COLLECT FORMS				
CLERK PRODUCTION REC	CLERK I	CLERK TYPIST III	CLERK TYPIST II	OPERATOR TAB
PROGRAMMER LEAD				
TASK:316 TYPE FORMS				
CLERK STENO II	CLERK FILE	OPERATOR ENCODER	SECRETARY RECEPTIONI	STENOGRAPHER SR

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:317 BIND OUTPUT				
CLERK CONTROL	OPERATOR DATA RECORD			
TASK:318 MAINTAIN LOG				
ACCOUNTANT	CLERK I	CLERK INPUT OUTPUT	CLERK TYPIST II	CLERK TYPIST I
CLERK CONTROL	DATA CHECKER	SUPERVISOR DATA PREP		
TASK:319 LOG OUTPUT				
CLERK INPUT OUTPUT	CLERK TYPIST I	COORDINATOR ASST	COORDINATOR	DATA CHECKER
RECONCILIATOR PROOF				
TASK:320 ESTABLISH POLICIES				
COORDINATOR DP ACCTG	COORDINATOR HOSPITAL	DIRECTOR DP	SYSTEMS DESIGNER	
TASK:321 PLAN MEETINGS				
SECRETARY	SYSTEMS DESIGNER			
TASK:322 BATCH FORMS				
CLERK CODING	OPERATOR KP I	OPERATOR KP II	STENOGRAPHER SR	
TASK:323 CONDUCT TOURS				
MANAGER	OPERATOR DP SR	OPERATOR DP		
TASK:324 ORDER EQUIPMENT				
ANALYST SYSTEMS SR	COORDINATOR HOSPITAL	MANAGER		
TASK:325 REVIEW REQUESTS				
COORDINATOR HOSPITAL	DIRECTOR	MANAGER		
TASK:326 CALCULATE PAYROLL				
CLERK TYPIST III	CLERK PAYROLL	SECRETARY RECEPTIONI	STENOGRAPHER SR	SUPERVISOR
SUPERVISOR WPC				
TASK:327 DELIVER FINISHED WOR				
CLERK RECORDS	OPERATOR KP I	OPERATOR MTST MTSC	SECRETARY	SECRETARY MTST MTSC
SUPERVISOR KP I	SUPERVISOR WPC			
TASK:328 NEWSWRITING				
SUPERVISOR WPC	TECHNICAL WRITER			
TASK:329 ORDER SUPPLIES				
ADMINISTRATIVE ASST	SUPERVISOR WPC			
TASK:330 PROOFREAD				
CLERK STATISTICAL	CLERK TYPIST I	OPERATOR KP I	OPERATOR MTST MTSC	SECRETARY
SECRETARY MTST MTSC	STENOGRAPHER SR	SUPERVISOR WPC		
TASK:331 ARRANGE TRAVEL				
ANALYST SYSTEMS SR	PROGRAMMER ENGNR	SECRETARY		
TASK:332 COLLATE RECORDS				
CLERK DATA CONTROL	SECRETARY			

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:333 MAKE COFFEE					
SECRETARY RECEPTIONI	SECRETARY				
TASK:334 TYPE INSTRUCTIONS					
SECRETARY	SUPERVISOR KP I				
TASK:335 WRITE FORMS					
CLERK PAYROLL	DATA CHECKER				
TASK:336 TELEPHONING					
SECRETARY OPERATOR K	SUPERVISOR DATA PREP				
TASK:337 LOG FORMS					
CLERK EDP CONTROL I	CLERK TRAFFIC ACCIDE	SECRETARY RECEPTIONI			
TASK:338 MAIL OUTPUT					
ACCOUNTANT	CLERK CASHIER	CLERK INPUT OUTPUT	DATA CHECKER	DATA MATERIAL HANDLE	
OPERATOR KP I	OPERATOR KP II	PROGRAMMER ENGNR			
TASK:339 OPERATE TERMINAL					
ANALYST SYSTEMS	CLERK I	CLERK TYPIST III	CLERK INPUT OUTPUT	CLERK TYPIST II	
CLERK TYPIST I	COORDINATOR NURSING	COORDINATOR HOSPITAL	NURSE GENERAL III	OPERATOR KP I	
OPERATOR KP II	TECHNICAL WRITER				
TASK:340 ORIENT EMPLOYEES					
ANALYST SYSTEMS	COORDINATOR HOSPITAL	STENOGRAPHER SR			
TASK:341 UPDATE DOCUMENTATION					
ANALYST SYSTEMS	COORDINATOR HOSPITAL	OPERATOR KP II	PROGRAMMER JR	PROGRAMMER TRAINEE	
PROGRAMMER I	TECHNICAL WRITER				
TASK:342 FILE SOURCE DOCUMENT					
CLERK TYPIST III	CLERK TYPIST I	OPERATOR KP I			
TASK:343 LOG TERMINAL USAGE					
CLERK TYPIST III	CLERK TYPIST II	CLERK TYPIST I	COORDINATOR NURSING	OPERATOR KP I	
OPERATOR KP II					
TASK:344 OPERATE PRINTER					
CLERK TYPIST II	OPERATOR KP I	OPERATOR KP II			
TASK:345 MAIL, PICK UP					
CLERK TYPIST III	OPERATOR KP I	STENOGRAPHER SR			
TASK:346 POST FLOWCHART					
CLERK TYPIST III	CLERK TYPIST II				
TASK:347 EDUCATE USERS					
ANALYST SYSTEMS SR	PROGRAMMER ENGNR				
TASK:348 REVIEW OUTPUT					
ACCOUNTANT	ANALYST SYSTEMS	DESIGNER	ENGINEER		

TABLE IV (CONTINUED)

TASKS LISTED WITH ASSOCIATED JOBS

TASK:349 WRITE USER GUIDE			
ANALYST SYSTEMS	TECHNICAL WRITER		
TASK:350 DEBUG SYSTEMS			
PROGRAMMER TECHNICIA	PROGRAMMER I		
TASK:351 WRITE JOB CONTROL			
PROGRAMMER ENGNR	PROGRAMMER I		
TASK:352 ASSIGN WORK			
PROGRAMMER ENGNR	SUPERVISOR DATA PREP		
TASK:353 VERIFY REPORTS			
CLERK TYPIST III	CLERK INPUT OUTPUT	MANAGER ADM SERVICES	
TASK:354 DUPLICATING			
CLERK TRAFFIC ACCIDE	DATA CHECKER	SUPERVISOR KP I	
TASK:355 BALANCE OUTPUT			
CASHIER	COORDINATOR	EXPEDITER	OPERATOR EDP II
TASK:356 COLLATE CARDS, MANUA			
CLERK STATISTICAL	DATA CHECKER	PROGRAMMER ENGNR	
TASK:357 MAINTAIN MANUALS			
DATA CHECKER	TECHNICAL WRITER		
TASK:358 POST OUTPUT			
ACCOUNTANT	CLERK VERIFICATION		
TASK:359 REVIEW MANUALS			
COORDINATOR DP ACCTG	DETAILER SR		
TASK:360 DEVELOP INPUT DATA			
ANALYST RESEARCH	SECRETARY TRANS DATA	SECRETARY ACCTG DATA	

LIST OF UNMATCHED TASKS AT END.

1 SECRETARY TRANS DATA

contains a 4.5% redundancy due to a fault in the processing program; 16 tasks are duplicates within the count of 360.)

Isolated from the other tables, this one conceals little. Clusters of job titles are still visible and obviously certain tasks are more common than others. As an example, 28 tasks were shared by more than 30 employees each; between 50 and 60 more were shared by a dozen or more employees. In percentages, these examples represent about 20 and 50 percent of the 178 identified occupations. The entire list could be tabulated in this manner, but the data seems to reveal more when considered as it was intended -- in relation to the other tables.

Having recognized the identification of eight clusters of occupations from Table I, rosters of tasks listed frequently by any or all of the clusters could be developed. One such informal tallying shows from four to six analysts (by another swift tally, that represents 30 to 40 percent of the analysts) indicated that their work included: Assign Work, Design Systems, Consult Users, Job Assistance, Study, Verification, Operate Computer, Review Systems, Document Systems, Assist Programmers, Attend Meetings, Test Programs, and Write Special Programs.

This 30 to 40 percent work-sharing indicates less uniqueness than the analysts' titles indicate. A group profile from Table I will help accent this apparent dichotomy. Fifteen different job titles came from the sample of 25 respondents in the analyst group. (See Table I.) These came from SIC codes 4, 11, and 12 and represented 81 total employees. However, only <u>two</u> titles appeared in more than one SIC code: Systems Analyst is found in codes 11, 12; Systems Analyst II in SIC codes 4, 11 (see Table I).

Logically, then, if different occupational titles really meant different work only two analysts' titles would be expected to appear under any task in Table IV. Yet, a close survey showed over a dozen tasks each followed by 4 to 6 analysts' titles.

It does begin to appear that "what" could be taught in data-processing curriculums may be identified from data presented to this point, but the question of "at what educational level" still has no criterion. For this reason, Tables V and VI are structured around a common employment-level indicator: pay-rate (Awad, 1971) (Blau, 1971) (Inkeles, 1970).

Table V presents the 178 identified occupational titles arranged in a hierarchy based on the mean salaries computed for Table I. Thus, the relative salary positions of these employees are approximated on paper as they existed in the work force sampled at the time of this study.

As a measure of variability, a standard deviation (Popham, 1967, p. 21) accompanies the mean pay for each title as does a percentage indicator of how promotable the occupation seemed to be.

Characteristics of these first two types of statistics were considered before they were selected (Popham, 1967) (Smith and Adams, 1966) (VanDalen, 1966). Obviously the mean had to be computed for use in the standard deviation formula, but it was also used because it utilizes the values of each data item and is the foundation for other standard statistics such as the t test. (This is the type which might be used to detect degrees of difference or similarity between means presented in this study and those developed in a replication or in a similar study.)

That the standard deviations presented in these tables are relatively large, in some cases, indicates (1) that the salaries reported ranged widely and that that occupation's pay-level is not as stabilized in the labor force as are others; or, (2) that there were too few occurrences of that job title to yield a stable result. Page 103, Table V in Operator KP shows a typical instance of salary fluctuation. Four titles above this, Operator Verifier, is an instance of an infrequent occupational title. Table I, column F, has the frequency of occurrence of any job title.

These statistics begin to have more meaning when considered with groups of titles from the alphabetic listing -- Table I. Of the 15 analysts' mean salaries, the range was from a low of $500 on line 5 to a high of $1250 on line 9. These 15 mean salaries on lines 5 - 19 have a rough average of $854. To reach a weighted average would necessitate considering how many analysts were represented by each mean salary (i.e., multiply "tot" by "pay") before totaling the pay. The divisor would not be 15, but rather 81 (add the "tot" column for lines 5 - 19).

In general, Table V may be interpreted as in this consideration of Clerk Typist II (see Figure 9):

(1) The occupation is located at the lower limit of the pay scale with an average salary of $294 per month.

(2) The standard deviation of $212 indicates that the mean salary will be likely to vary between businesses.

(3) Sixty-six percent of the Clerk Typists II reporting were promotable.

(4) They also reported that their most frequent tasks were: operating a terminal and a card sorter, filing forms or

cards, distributing work, collating forms, logging, etc.

(5) Much of their work is with "forms" and they also do some other equipment operation -- printers, keypunch, interpreter.

At nine points in Table V, a message refers to a "Supplementary Report." This report, designated Table VI, immediately follows Table V and carries the task information for the job title listed above the message. These nine occupations reported more than 60 different tasks each.

Some secondary significance lurks in conjunction with recollections of earlier presentations. For instance, one fact is "so visible it is invisible" -- these last 29 pages contain only 458 different tasks. (The Computer Operator listing in Table VI contains 217 -- as a size reference.) About 100 more tasks are unique to one job title, each, which means that both tables are composed of 178 job titles repeating the same 360 tasks over and over.

The dominant intent of this study was to identify, to combine, and to rank in this manner the data that appears here. The third specific purpose of this study would be unfulfilled without the tasks which are also presented in Tables V and VI. It seemed pertinent not only to be able to say what employees were called at any potential labor-market entry level but also to know what tasks were associated with that same entry level.

With the people and their performances identified, some aspects of the related working environment were necessary to complete the frame of reference.

GENERAL: Combined, unduplicated title and task listing arranged from low to high order by mean salary.

Accompanying tasks carry combined performance frequencies as reported by the employees.

Table V was limited to 60 taks per job title, Table VI picked up the nine job titles mentioning more than 60 tasks.

Figure 10. Coding Legend and Reference for Tables V and VI

TABLE V

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

MANAGER SOFTWARE SEC	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 0			
ASSIGN WORK	1	CONSULT MANAGEMENT	1	CONSULT SUPERVISORS	1	EDUCATE SELF	1		
ESTABLISH PRIORITIES	1	EVALUATE EMPLOYEES	1	IMPLEMENT SYSTEMS	1	MONITOR WORK FLOW	2		
PREPARE BUDGET	1	RECOMMEND CHANGES	1	SUPERVISE PERSONNEL	1	SUPERVISING	1		
WRITE MEMOS	1								
METER READER	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 0			
CODE INPUT DATA	1	VERIFY DATA	1						
STOCKMAN	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 0			
BURST FORMS	2	DECOLLATE OUTPUT	1	DELIVER FORMS	7	DISTRIBUTE OUTPUT	1		
DISTRIBUTE SUPPLIES	1	MAIL, DISTRIBUTE	1	MOVE CARDS OR FORMS	1	PREPARE REPORTS	2		
STORE FORMS OR CARDS	2	WRITE FORMS	1						
TAPEWRITER	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 0			
KEY TAPE	11	TAPE, SEARCH	1	TAPE, PREPARE LABELS	1	TAPE, RELEASE	1		
VERIFY DATA	1								
SUPERVISOR SHIFT ASS	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 100			
BOX FORMS	1	BURST FORMS	1	COMPUTER JOBS	8	DELIVER DATA	1		
DISK, FILE	1	HOUSEKEEPING	1	KEYPUNCH CARDS	4	MONITOR SYSTEM	1		
MOVE CARDS OR FORMS	2	PREPARE INPUT DATA	3	PRINTER, LOAD FORMS	1	SEPARATE OUTPUT	1		
SORT FORMS	1	TAPE, FILE	1	TAPE, PREPARE	1				
PHYSICIAN GENERAL II	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 0			
CODE INPUT DATA	2								
PHYSICIAN GENERAL I	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 0			
CODE INPUT DATA	2								
COORDINATOR BILLING	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 0			
COLLECT DATA	1	CORRECT ERRORS	1	EDIT OUTPUT	1	VERIFY OUTPUT VALIDI	2		
PSYCHIATRIC AIDE II	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 0			
UPDATE OUTPUT	2								
MANAGER FOOD SERVICE	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 0			
CORRECT ERRORS	1	RECEIVE OUTPUT	6						
ACCOUNTANT II	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 0			
COLLECT DATA	4								
TECHNICIAN EDP III	AVERAGE	SALARY: $ 0	STANDARD DEVIATION: $ 0			PROMOTE PERCENT: 0			
ATTEND MEETING	1	CHANGE JOB CONTROL	2	COLLECT DATA	1	COMMUNICATION, VERBA	1		
COMPUTER JOBS	2	CONSULT MANAGEMENT	1	COORDINATE WORK FLOW	5	DESIGN JOB CONTROL	3		
INSTRUCT OPERATORS	1	INSTRUCT EMPLOYEES	1	JOB ASSISTANCE	2	LOG MALFUNCTIONS	2		
MONITOR COMPUTER	1	PLANNING	1	RECEIVE SOURCE DOCUM	1	RECEIVE INSTRUCTIONS	3		
RELAY INFORMATION	2	RELIEVE OPERATORS	4	SYSTEM PREPARATION	3	TRAIN EMPLOYEES	1		
VERIFY OUTPUT VALIDI	5	VERIFY DATA	5						

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

SECRETARY VERIFIER	AVERAGE	SALARY: $ 0	STANDARD	DEVIATION: $ 0	PROMOTE	PERCENT: 100			
FILE FORMS OR CARDS	2	LOG TAPES	2	SPECIAL ASSIGNMENTS	1	TELEPHONING	20		
TYPE	1	VERIFY KEYPUNCHED JO	12	XEROXING	1				
CLERK TYPIST I	AVERAGE	SALARY: $ 237	STANDARD	DEVIATION: $ 172	PROMOTE	PERCENT: 33			
CODE INPUT DATA	12	COLLECT DATA	3	DECOLLATE OUTPUT	1	DESIGN JOB CONTROL	1		
DISTRIBUTE OUTPUT	2	EDIT FORMS	1	FILE SOURCE DOCUMENT	2	KEY DATA	1		
LOG OUTPUT	1	LOG TERMINAL USAGE	1	MAINTAIN LOG	1	OPERATE TERMINAL	2		
ORDER SUPPLIES	1	PROOFREAD	3	SEPARATE OUTPUT	1	TELEPHONING	2		
WRITE PROGRAMS, SPEC	2								
OPERATOR VERIFIER	AVERAGE	SALARY: $ 250	STANDARD	DEVIATION: $ 249	PROMOTE	PERCENT: 50			
VERIFY CARDS	23	VERIFY KEYPUNCHED JO	33						
SECRETARY ACCTG DATA	AVERAGE	SALARY: $ 288	STANDARD	DEVIATION: $ 0	PROMOTE	PERCENT: 0			
CODE INPUT FORMS	4	DEVELOP INPUT DATA	1	VERIFY OUTPUT VALIDI	2				
CLERK TYPIST II	AVERAGE	SALARY: $ 294	STANDARD	DEVIATION: $ 212	PROMOTE	PERCENT: 66			
CODE INPUT DATA	8	COLLATE FORMS	10	COLLECT FORMS	5	CORRECT ERRORS	6		
DELIVER FORMS	2	DISTRIBUTE WORK	10	DISTRIBUTE OUTPUT	3	EDIT OUTPUT	2		
EDIT INPUT DATA	1	EDIT FORMS	5	FILE FORMS OR CARDS	15	HOUSEKEEPING	1		
INTERPRET CARDS	1	INVENTORY SUPPLIES	1	KEYPUNCH CARDS	1	LOG TERMINAL USAGE	10		
LOG PRODUCTION	1	MAINTAIN LOG	2	MONITOR INVENTORY	2	OPERATE TERMINAL	24		
OPERATE PRINTER	5	POST FLOWCHART	5	RECEIVE OUTPUT	1	SEPARATE FORMS	2		
SORT CARDS	22	STAMP FORMS	5	STORE FORMS OR CARDS	1	TELEPHONING	2		
TYPE	1	WRITE PROGRAMS, SPEC	1	WRITE FORMS	2	WRITE MEMOS	6		
SECRETARY OPERATOR K	AVERAGE	SALARY: $ 300	STANDARD	DEVIATION: $ 0	PROMOTE	PERCENT: 0			
BALANCE REPORTS	1	ENCODE DATA	1	KEYPUNCH PROGRAMS	1	KEYPUNCH JOBS	4		
MAIL, DISTRIBUTE	1	MAIL, SORT	1	PREPARE REPORTS	1	ROUTE INCOMING CALLS	60		
TELEPHONING	11	UPDATE LOG	1						
OPERATOR KP	AVERAGE	SALARY: $ 322	STANDARD	DEVIATION: $ 200	PROMOTE	PERCENT: 68			
ASSIST OPERATORS	1	BALANCE REPORTS	1	CHANGE RIBBON	2	CLERICAL WORK	1		
CODE INPUT DATA	2	COLLECT INPUT	1	CORRECT PROGRAMS	1	CORRECT ERRORS	1		
DELIVER COMPUTER JOB	1	DELIVER FORMS	1	DESIGN DRUM CARD	7	DISTRIBUTE WORK	1		
EMPTY CHIP BOX	2	FOLLOW INSTRUCTIONS	1	HOUSEKEEPING	2	INTERPRET CARDS	11		
KEY TAPE	2	KEYPUNCH DRUM CARD	2	KEYPUNCH DRUM CARDS	1	KEYPUNCH PROGRAMS	19		
KEYPUNCH JOBS	281	LOG PRODUCTION	10	MAIL, PREPARE	1	MAIL, PROCESS	2		
MAIL, DISTRIBUTE	1	MAIL, SORT	1	MAINTAIN FILES	1	RECEIVE SOURCE DOCUM	1		
RECEIVE CARDS	1	REFER TO FILES	2	RELIEVE SUPERVISOR	1	RELIEVE EMPLOYEE	1		
REPRODUCE CARDS	1	SEPARATE FORMS	1	SORT CARDS	8	SPECIAL ASSIGNMENTS	1		
STAMP FORMS	2	STORE FORMS OR CARDS	1	TAPE, PREPARE LABELS	1	TELEPHONING	3		
TRAIN OPERATORS	1	UPDATE INPUT DATA	1	UPDATE PROCEDURES	2	VERIFY KEYPUNCHED JO	1		
VERIFY INPUT DATA	2	VERIFY CARDS	47	VERIFY DATA	1	WIRE CONTROL PANELS	1		
WRITE FORMS	2	WRITE NOTES	1						
CLERK ACCT II	AVERAGE	SALARY: $ 327	STANDARD	DEVIATION: $ 0	PROMOTE	PERCENT: 100			
KEYPUNCH PROGRAMS	1	KEYPUNCH JOB CONTROL	1	PREPARE USER GUIDE	1	TELEPHONING	1		

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

SUPERVISOR KP	AVERAGE SALARY: $ 334	STANDARD DEVIATION: $ 275	PROMOTE PERCENT: 19				
ADMINISTER TEST	1	ANSWER QUESTIONS	1	ASSIGN WORK	4	CONSULT SUPERVISORS	3
CONSULT PROGRAMMERS	1	CONSULT USERS	1	COORDINATE WORK FLOW	4	CORRECT ERRORS	2
COUNSEL EMPLOYEES	2	DELIVER CARDS	3	DESIGN FORMS	1	DESIGN DRUM CARD	1
EDIT INPUT DATA	1	EDIT CODING	5	EVALUATE EMPLOYEES	2	FILE FORMS OR CARDS	2
HOUSEKEEPING	1	INSTRUCT OPERATORS	1	INSTRUCT EMPLOYEES	3	INTERVIEW APPLICANTS	1
JOB ASSISTANCE	1	KEYPUNCH JOBS	1	KEYPUNCH DRUM CARD	1	LOG WORK	3
LOG PRODUCTION	1	MONITOR WORK FLOW	4	PERFORATE PAPERS	1	READ	1
RELAY INFORMATION	2	RELIEVE OPERATORS	1	REVIEW DOCUMENTATION	1	SELECT PERSONNEL	1
SORT CARDS	29	STUDY	1	SUPERVISE PERSONNEL	1	TELEPHONING	5
TRACE ERRORS	1	TRAIN EMPLOYEES	1	TRAIN OPERATORS	2	UPDATE MANUALS	2
VERIFY CARDS	2	VERIFY WORK QUALITY	2	VERIFY DATA	6	WRITE INSTRUCTIONS	1
CLERK PAYROLL	AVERAGE SALARY: $ 350	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
APPROVE SYSTEMS	1	BALANCE REPORTS	1	BURST FORMS	1	CALCULATE PAYROLL	1
CODE INPUT DATA	1	DEPOSIT FUNDS	1	FILE REPORTS	4	KEYPUNCH CARDS	1
LABELING	1	MAIL, PREPARE	2	PREPARE REPORTS	1	SEPARATE FORMS	2
WRITE FORMS	1						
SECRETARY RECEPTIONI	AVERAGE SALARY: $ 360	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
ANSWERING SERVICE	1	APPROVE PAYMENTS	1	APPROVE ORDERS	1	ASSIGN WORK	1
BALANCE REPORTS	2	CALCULATE PAYROLL	1	FILE	1	INVENTORY SUPPLIES	1
KEYPUNCH CARDS	1	LIAISON	1	LOG FORMS	3	MAIL, PREPARE	1
MAIL, SORT	1	MAIL, PROCESS	2	MAKE COFFEE	1	ORDER SUPPLIES	2
ORDER PASTRY	1	PLANNING	1	RECEIVE SOURCE DOCUM	4	REFER TO FILES	1
SORT CARDS	1	SORT FORMS	1	TYPE	1	TYPE FORMS	2
XEROXING	1						
CLERK CODING	AVERAGE SALARY: $ 363	STANDARD DEVIATION: $ 13	PROMOTE PERCENT: 50				
ASSIGN WORK	1	BATCH FORMS	2	CODE INPUT DATA	31	COMPUTER JOBS	5
FILE	1	INTERPRET CARDS	1	KEYPUNCH JOBS	1	LOG	1
REFER TO FILES	1	SEPARATE OUTPUT	1	TAPE, PREPARE LABELS	1	TELEPHONING	1
TRANSFER DATA	1	UPDATE LIBRARY	1				
CLERK I	AVERAGE SALARY: $ 375	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ATTEND MEETING	1	CODE INPUT DATA	20	COLLECT FORMS	24	CORRECT ERRORS	1
DEVELOP PROCEDURES	1	DISTRIBUTE OUTPUT	1	KEYPUNCH CARDS	2	LIAISON	1
MAIL, SORT	1	MAINTAIN LOG	1	OPERATE TERMINAL	1	REFER TO FILES	1
RELIEVE OPERATORS	1	SORT CARDS	2	TELEPHONING	1	VERIFY DATA	2
VERIFY OUTPUT VALIDI	2	WRITE PROGRAMS, SPEC	1				
SECRETARY TRANS DATA	AVERAGE SALARY: $ 375	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
CODE INPUT FORMS	1	DEVELOP INPUT DATA	1	VERIFY OUTPUT VALIDI	1		

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

OPERATOR KP I AVERAGE SALARY: $ 387 STANDARD DEVIATION: $ 113 PROMOTE PERCENT: 92

TASK LIST OVERFLOW; SEE SUPPLEMENTARY REPORT.

OPERATOR BURSTER	AVERAGE SALARY: $ 388		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
BIND BOOKS	1	BURST FORMS	1	DECOLLATE OUTPUT	1	SIGN DOCUMENTS	1	
TELEPHONING	1							
PROCESSOR	AVERAGE SALARY: $ 389		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
CODE INPUT DATA	1	CORRECT ERRORS	4	MAINTAIN SYSTEMS	1	UPDATE SYSTEMS	1	
VERIFY OUTPUT VALIDI	4	VERIFY DATA	4					
CLERK CONTROL	AVERAGE SALARY: $ 400		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 0			
BALANCE REPORTS	2	BIND OUTPUT	1	BURST FORMS	2	CLERICAL WORK	1	
DECOLLATE OUTPUT	2	DELIVER FORMS	2	DISTRIBUTE OUTPUT	3	FILE REPORTS	1	
LOG WORK	1	LOG BATCHES	2	MAINTAIN LOG	2	MAINTAIN LIBRARY	1	
MOVE CARDS OR FORMS	1	PREPRARE PROGRAMMER	1	RECEIVE TRAINING	1	SEPARATE CARDS	1	
TELEPHONING	1	TRACE ERRORS	1	UPDATE FILES	9	VERIFY DATA	1	
XEROXING	1							
RECONCILIATOR PROOF	AVERAGE SALARY: $ 400		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 0			
BALANCE REPORTS	4	LOG COMPUTER TIME	3	LOG OUTPUT	3	PREPARE REPORTS	1	
SORT CARDS	2							
OPERATOR ENCODER	AVERAGE SALARY: $ 400		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 0			
BALANCE REPORTS	2	CALCULATE	3	ENCODE FORMS	28	LOG TOTALS	1	
REPRODUCE CARDS	2	TYPE FORMS	2					
SECRETARY MTST MTSC	AVERAGE SALARY: $ 400		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
ANSWER QUESTIONS	1	CALCULATE	1	CORRECT ERRORS	2	DELIVER FINISHED WOR	1	
DESIGN OUTPUT FORMAT	1	LOAD COMPOSER	1	LOAD MTST	1	LOG	2	
PROOFREAD	1	TYPE	1					
CLERK TRAFFIC ACCIDE	AVERAGE SALARY: $ 404		STANDARD DEVIATION: $ 21		PROMOTE PERCENT: 0			
ANALYZING	2	CLERICAL WORK	5	CODE INPUT DATA	6	DIAGRAM	6	
DUPLICATING	3	FILE REPORTS	1	FILE FORMS OR CARDS	3	FILE	2	
LOG	1	LOG FORMS	2	PROCESS REPORTS	4	PROCESS INPUT DATA	4	
PROCESS OUTPUT	8	REPLENISH SUPPLIES	1	SORT REPORTS	5	XEROXING	4	
CLERK ACCOUNTING	AVERAGE SALARY: $ 405		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 0			
BALANCE REPORTS	2	CODE INPUT DATA	1	VERIFY OUTPUT VALIDI	1			
CLERK INPUT OUTPUT	AVERAGE SALARY: $ 410		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 0			
CORRECT ERRORS	1	DECOLLATE OUTPUT	1	DISTRIBUTE SUPPLIES	1	DISTRIBUTE REPORTS	1	
INTERPRET CARDS	1	LOG OUTPUT	1	LOG	1	MAIL, PROCESS	1	
MAIL OUTPUT	4	MAINTAIN LOG	1	MONITOR SYSTEM	2	OPERATE TERMINAL	1	
OPERATE CARD EQUIPME	1	ORDER SUPPLIES	1	RELIEVE EMPLOYEE	1	SEPARATE OUTPUT	1	
SHRED FORMS	1	TAPE, MAIL	3	VERIFY REPORTS	1			
OPERATOR DATA RECORD	AVERAGE SALARY: $ 412		STANDARD DEVIATION: $ 12		PROMOTE PERCENT: 100			
BIND OUTPUT	1	BURST FORMS	2	KEYPUNCH JOBS	2	MAINTAIN FILES	1	
PROCESS CORRESPONDEN	1	RECEIVE TRAINING	2	REFER TO FILES	2	RELIEVE OPERATORS	1	
SORT CARDS	2	SPECIAL ASSIGNMENTS	2	STORE FORMS OR CARDS	1	TYPE	1	
UPDATE FILES	1	VERIFY CARDS	1					

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

CLERK PRODUCTION REC	AVERAGE SALARY: $ 414	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
COLLECT FORMS	5	DELIVER COMPUTER JOB	5	LOG BATCHES	1	MONITOR WORK FLOW	10
WRITE FORMS	3						
CLERK RECORDS	AVERAGE SALARY: $ 414	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
COLLECT DATA	1	DELIVER FINISHED WOR	3	DISTRIBUTE WORK	1	LOG BATCHES	10
LOG WORK	1	MONITOR WORK FLOW	1	TELEPHONING	10	VERIFY OUTPUT VALIDI	10
OPERATOR MTST MTSC	AVERAGE SALARY: $ 416	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ANSWER QUESTIONS	1	CALCULATE	1	CHANGE RIBBON	2	DELIVER FINISHED WOR	2
FILE FORMS OR CARDS	1	LOAD TAPES	2	LOAD TRANSCRIBER	1	LOG	3
LOG TAPES	1	OPERATE OFFICE EQUIP	1	PROOFREAD	1	TAPE, PREPARE LABELS	1
TYPE LETTERS	2	TYPE MEMOS	2				
OPERATOR DP	AVERAGE SALARY: $ 417	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
CONDUCT TOURS	1	CONSULT USERS	1	KEYPUNCH JOB CONTROL	1	KEYPUNCH PROGRAMS	1
KEYPUNCH CARDS	1	REPRODUCE CARDS	1	SORT CARDS	1	SPECIAL ASSIGNMENTS	1
TAB, LIST CARDS	1	VERIFY DATA	1	VERIFY CARDS	1		
SUPERVISOR WPC	AVERAGE SALARY: $ 422	STANDARD DEVIATION: $ 12	PROMOTE PERCENT: 100				
ANSWER QUESTIONS	7	ASSIGN WORK	1	CALCULATE PAYROLL	1	CONDUCT MEETING	1
CORRECT TAPE	2	CORRECT ERRORS	3	DELIVER FINISHED WOR	1	DELIVER FORMS	2
DESIGN FORMS	2	KEY TAPE	2	LOG ATTENDANCE	1	LOG MALFUNCTIONS	2
LOG PRODUCTION	2	MICROFILMING	1	MOVE TAPES	7	NEWSWRITING	1
OPERATE OFFICE EQUIP	2	ORDER SUPPLIES	6	PREPARE LOG	1	PROCESS CORRESPONDEN	1
PROOFREAD	2	RECEIVE TRAINING	1	RELIEVE SUPERVISOR	1	RELIEVE OPERATORS	2
REPLENISH SUPPLIES	2	SORT FORMS	2	STORE FORMS OR CARDS	1	TALLY LOG SHEETS	2
TAPE, PREPARE LABELS	1	TELEPHONING	13	TRAIN OPERATORS	4	TYPE	16
OPERATOR DATA INPUT	AVERAGE SALARY: $ 440	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
BALANCE REPORTS	1	DISK TO TAPE CONVERS	6	KEY DATA	1	KEYPUNCH JOBS	1
LOG WORK	1	MONITOR SYSTEM	2	RECEIVE JOB REQUESTS	1	SELECT CARDS	1
SELECT PROGRAMS	1	TAPE, MOUNT	6	VERIFY CARDS	1	VERIFY WORK QUALITY	1
OPERATOR UTILITY	AVERAGE SALARY: $ 440	STANDARD DEVIATION: $ 39	PROMOTE PERCENT: 100				
BALANCE INPUT DATA	2	BURST FORMS	8	INTERPRET CARDS	10	KEYPUNCH JOB CONTROL	2
MAINTAIN EQUIPMENT	2	REPRODUCE CARDS	1	SEPARATE OUTPUT	2	STORE FORMS OR CARDS	4
STUDY	2	TAB, LIST CARDS	10	TAPE, BUILD BACK UP	10	TAPE, FILE	10
TAPE, PREPARE LABELS	2	WIRE CONTROL PANELS	2				
ENCODER DATA	AVERAGE SALARY: $ 440	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
CODE INPUT DATA	1	KEYPUNCH JOBS	6				
TAPE ENCODER	AVERAGE SALARY: $ 440	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ENCODE TAPE	23	STAMP FORMS	1	VERIFICATION	1		
CLERK CONTROL SET UP	AVERAGE SALARY: $ 450	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
CALCULATE	1	DELIVER FORMS	8	HOUSEKEEPING	1	INSERT FORMS	1
INTERPRET CARDS	1	MAIL, DISTRIBUTE	1	MAIL, SORT	2	MICROFILMING	1
POST	1	PREPARE REPORTS	12	VERIFY DATA	1		

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

CLERK STENO II	AVERAGE SALARY: $ 450	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
CODE INPUT FORMS	4	CONSULT MANUFACTURER	1	CORRECT ERRORS	1	DECOLLATE OUTPUT	1
DELIVER FORMS	1	DESIGN FORMS	2	EDIT FORMS	2	FILE FORMS OR CARDS	1
KEYPUNCH CARDS	1	LOG ATTENDANCE	1	MAIL, DISTRIBUTE	1	MAIL, PROCESS	1
ORDER SUPPLIES	2	PROCESS CORRESPONDEN	1	RUN ERRANDS	1	TELEPHONING	1
TYPE FORMS	2	TYPE LETTERS	2	TYPE MEMOS	1	WRITE LETTERS	1
WRITE MEMOS	2						
OPERATOR KP II	AVERAGE SALARY: $ 451	STANDARD DEVIATION: $ 134	PROMOTE PERCENT: 71				

TASK LIST OVERFLOW; SEE SUPPLEMENTARY REPORT.

ADMINISTRATIVE ASST	AVERAGE SALARY: $ 454	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
ANSWER QUESTIONS	1	ASSIGN WORK	2	CODE INPUT DATA	2	COMPUTER JOBS	4
DISTRIBUTE SUPPLIES	1	INTERPRET CARDS	1	INVENTORY SUPPLIES	3	KEYPUNCH CARDS	1
MAINTAIN FILES	9	ORDER SUPPLIES	3	SPECIAL ASSIGNMENTS	10		
SECRETARY	AVERAGE SALARY: $ 458	STANDARD DEVIATION: $ 32	PROMOTE PERCENT: 50				
ANSWER USER QUESTION	1	ARRANGE TRAVEL	1	CLERICAL WORK	1	COLLATE RECORDS	1
COMPUTER JOBS	2	DELIVER FINISHED WOR	1	DEMONSTRATE TERMINAL	1	FILE	3
HOUSEKEEPING	1	INVENTORY SUPPLIES	1	JOB ASSISTANCE	1	KEYPUNCH PROGRAMS	2
LIAISON	1	LOG	1	LOG WORK	1	MAIL, SORT	2
MAIL, PREPARE	1	MAIL, PROCESS	3	MAKE COFFEE	3	ORDER SUPPLIES	2
PLAN MEETINGS	3	PREPARE REPORTS	2	PREPARE INPUT DATA	2	PROCESS CORRESPONDEN	2
PROOFREAD	1	REFER TO FILES	1	RELAY INFORMATION	1	ROUTE CALLERS	1
RUN ERRANDS	1	SPECIAL ASSIGNMENTS	6	STAMP FORMS	1	STORE FORMS OR CARDS	1
TELEPHONING	17	TERMINAL, KEY DICTAT	1	TRANSFER DATA	1	TYPE LETTERS	2
TYPE INSTRUCTIONS	1	TYPE	23	UPDATE FILES	1	WRITE MEMOS	1
WRITE PROGRAMS	2	XEROXING	5				
OPERATOR DP SR	AVERAGE SALARY: $ 458	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
ASSIST PROGRAMMERS	1	CONDUCT TOURS	1	CONSULT USERS	1	DESIGN CARD LAYOUTS	1
KEYPUNCH JOB CONTROL	1	KEYPUNCH PROGRAMS	1	KEYPUNCH CARDS	1	REPRODUCE CARDS	1
SORT CARDS	1	SPECIAL ASSIGNMENTS	1	TAB, LIST CARDS	1	VERIFY CARDS	1
DATA MATERIAL HANDLE	AVERAGE SALARY: $ 460	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
APPROVE PAYMENTS	1	JOB ASSISTANCE	1	KEYPUNCH JOBS	1	MAIL OUTPUT	1
MAINTAIN FILES	1	SEPARATE OUTPUT	1	SORT CARDS	1	SPECIAL ASSIGNMENTS	1
TELEPHONING	1	TYPE MEMOS	1	VERIFY OUTPUT VALIDI	1		
CLERK ACCT III	AVERAGE SALARY: $ 460	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
COLLATE CARDS	1	KEYPUNCH PROGRAMS	1	KEYPUNCH JOB CONTROL	1	LOG WORK	1
SORT CARDS	1	VERIFY OUTPUT VALIDI	3				
TAPE LIBRARIAN	AVERAGE SALARY: $ 463	STANDARD DEVIATION: $ 68	PROMOTE PERCENT: 33				
APPROVE DOCUMENTATIO	1	CODE FORMS	10	CORRECT ERRORS	1	FILE TAPES	11
FILE FORMS OR CARDS	1	HOUSEKEEPING	1	INTERPRET CARDS	2	KEYPUNCH CARDS	1
LOG TAPES	10	MAINTAIN EQUIPMENT	1	MONITOR EQUIPMENT	2	MONITOR INVENTORY	1
MOVE CARDS OR FORMS	1	MOVE TAPES	10	OPERATE PLOTTER	1	ORDER SUPPLIES	1
REVIEW DOCUMENTATION	1	SEPARATE OUTPUT	1	SORT CARDS	1	SYSTEM PREPARATION	1
TAPE, CATALOG	6	TAPE, CODE	6	TAPE, SCRATCH	3	TAPE, TEST	1
TAPE, SORT	1	TAPE, DISTRIBUTE	1	TAPE, MAINTAIN	1	TAPE, STORE	1
TAPE, PREPARE	6	UPDATE LIBRARY	2	UPDATE LOG	2	VERIFY DATA	2
WRITE FORMS	1						

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

OPERATOR TAB	AVERAGE SALARY: $ 469	STANDARD DEVIATION: $ 25	PROMOTE PERCENT: 59				
BALANCE REPORTS	2	BALANCE INPUT DATA	3	BOX CARDS	1	BUNDLE STUBS	1
BURST FORMS	2	COLLATE CARDS	5	COLLECT FORMS	1	COMPUTER JOBS	2
DELIVER FORMS	1	FILE	1	HOUSEKEEPING	2	INTERPRET CARDS	15
KEYPUNCH JOBS	1	KEYPUNCH JOB CONTROL	2	KEYPUNCH CARDS	2	MAIL, PREPARE	1
MAINTAIN EQUIPMENT	2	MOVE TAPES	1	MOVE CARDS OR FORMS	2	RECEIVE CARDS	2
REPRODUCE CARDS	1	SEPARATE OUTPUT	2	SORT CARDS	6	SORT FORMS	3
STORE FORMS OR CARDS	4	TAB, LIST CARDS	14	TAPE, BUILD BACK UP	10	TAPE, FILE	10
TAPE, PREPARE LABELS	2	VERIFY KEYPUNCHED JO	1	WIRE CONTROL PANELS	3		
DATA CHECKER	AVERAGE SALARY: $ 476	STANDARD DEVIATION: $ 12	PROMOTE PERCENT: 0				
BURST FORMS	1	CLERICAL WORK	2	CODE INPUT FORMS	1	COLLATE CARDS	2
COLLATE CARDS, MANUA	1	CORRECT ERRORS	3	DELIVER COMPUTER JOB	1	DUPLICATING	1
FILE FORMS OR CARDS	2	INTERPRET CARDS	2	KEYPUNCH CARDS	2	LOG	1
LOG OUTPUT	1	LOG WORK	1	MAIL OUTPUT	5	MAIL, PROCESS	2
MAINTAIN FILES	2	MAINTAIN LOG	1	MAINTAIN MANUALS	1	MATCH DATA	1
OPERATE PLOTTER	3	PREPARE INPUT DATA	1	PROCESS CORRESPONDEN	1	SORT CARDS	1
STORE FORMS OR CARDS	1	TELEPHONING	2	VERIFICATION	1	VERIFY INPUT DATA	2
VERIFY OUTPUT VALIDI	3	WRITE PROGRAMS, SPEC	2	WRITE MEMOS	10	WRITE FORMS	12
STAGER	AVERAGE SALARY: $ 480	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
CONSULT COORDINATORS	10	DELIVER COMPUTER JOB	2	DISTRIBUTE OUTPUT	2	DISTRIBUTE REPORTS	1
FILE FORMS OR CARDS	1	FILE OUTPUT	1	LOG COMPUTER TIME	1	MICROFILMING	2
MONITOR SYSTEM	1	MOVE TAPES	1	REFER TO FILES	1	SEPARATE CARDS	1
TAPE, PREPARE LABELS	1	TELEPHONING	25				
OPERATOR EQUIPMENT O	AVERAGE SALARY: $ 480	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
BURST FORMS	1	COORDINATE WORK FLOW	1	DECOLLATE OUTPUT	1	DISTRIBUTE REPORTS	1
HOUSEKEEPING	1	PROCESS REPORTS	3	SEPARATE OUTPUT	1	TAKE TURN OVER	1
CLERK EDP CONTROL I	AVERAGE SALARY: $ 483	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ATTEND CLASS	1	COLLECT DATA	2	DELIVER FORMS	6	DISTRIBUTE REPORTS	4
LOG FORMS	1	MAIL, DISTRIBUTE	2	PREPARE REPORTS	6	SEPARATE FORMS	2
STAMP FORMS	2	SYSTEM PREPARATION	1	TRANSFER DATA	1	VERIFY OUTPUT VALIDI	1
XEROXING	1						
CLERK COST	AVERAGE SALARY: $ 489	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
DELIVER FORMS	1	LOG DATA FLOW	1	MATCH DATA	1	PROCESS OUTPUT	1
SEPARATE FORMS	1	VERIFY INPUT DATA	1	VERIFY OUTPUT VALIDI	1		
CLERK STATISTICAL	AVERAGE SALARY: $ 489	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
CALCULATE	4	CODE CARDS	8	COLLATE CARDS, MANUA	8	CORRECT ERRORS	4
FILE TAPES	8	PROOFREAD	1	TABULATE TAPE DATA	4	VERIFY OUTPUT VALIDI	8
WRITE FORMS	8						
CLERK DATA CONTROL	AVERAGE SALARY: $ 491	STANDARD DEVIATION: $ 22	PROMOTE PERCENT: 0				
CALCULATE	12	CODE INPUT DATA	301	COLLATE RECORDS	52	DEMONSTRATE COMPUTER	1
DISTRIBUTE OUTPUT	1	FILE FORMS OR CARDS	1	JOB ASSISTANCE	51	KEY DATA	660
PREPARE REPORTS	7	TELEPHONING	2	UPDATA DATA	150	UPDATE REPORTS	1

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

MANAGER OPERATIONS	AVERAGE SALARY: $ 494	STANDARD DEVIATION: $ 494	PROMOTE PERCENT: 50				
ANALYZING	1	APPROVE DOCUMENTATIO	1	APPROVE ORDERS	1	APPROVE PAYMENTS	1
ASSIGN WORK	2	ATTEND SEMINAR	1	ATTEND MEETING	1	BURST FORMS	1
COMMUNICATION, VERBA	2	COMPUTER JOBS	1	CONSULT USERS	11	CONSULT SUPERVISORS	2
COORDINATE MAINTENAN	1	COORDINATE WORK FLOW	3	DESIGN FORMS	1	DESIGN FILES	1
DESIGN FLOORPLAN,	2	DEVELOP PROCEDURES	1	EDUCATE SELF	1	ENFORCE POLICIES	2
ESTABLISH PRIORITIES	1	EVALUATE EMPLOYEES	4	IMPLEMENT SYSTEMS	1	INTERVIEW APPLICANTS	2
JOB ASSISTANCE	2	KEYPUNCH JOB CONTROL	1	LIAISON	1	LOG	4
MONITOR SYSTEM	1	MONITOR INPUT	1	MONITOR WORK FLOW	1	MONITORING	4
OPERATE COMPUTER	1	ORDER SUPPLIES	4	PLAN WORK SCHEDULE	1	PREPARE PROGRAM BOOK	1
PREPARE EMPLOYEE TRA	1	PREPARE BUDGET	1	READ MANUALS	1	RECEIVE TRAINING	1
RELAY INFORMATION	1	RELIEVE OPERATORS	1	REVIEW REPORTS	2	SCHEDULE COMPUTER TI	4
SELECT PERSONNEL	1	SPECIAL ASSIGNMENTS	1	STORE FORMS OR CARDS	1	SUPERVISE OPERATIONS	1
SUPERVISE PERSONNEL	5	TECHNICAL ADVICE	1	TROUBLESHOOTING	3	UPDATE SYSTEMS	1
UPDATE PROGRAMS	1	UPDATE MANUALS	2	WRITE PROGRAMS	1	WRITE MEMOS	10
WRITE REPORTS	1						
ANALYST CONTROL I	AVERAGE SALARY: $ 500	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
BALANCE REPORTS	1	CALCULATE	1	CODE INPUT FORMS	2	COLLECT DATA	20
COMPUTER JOBS	1	CONSULT USERS	1	CORRECT ERRORS	1	DELIVER FORMS	2
DISTRIBUTE REPORTS	1	EDIT INPUT DATA	20	FILE FORMS OR CARDS	5	KEYPUNCH JOB CONTROL	3
LOG BATCHES	1	POST	1	SEPARATE OUTPUT	5	SORT CARDS	20
STAMP FORMS	1	TYPE	1	VERIFY DATA	2	VERIFY CARDS	3
CLERK MAIL	AVERAGE SALARY: $ 500	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
BURST FORMS	1	DECOLLATE OUTPUT	1	DELIVER DATA	6	MAIL, PROCESS	4
MAIL, PREPARE	2	MICROFILMING	1	VERIFY DATA	2		
COORDINATOR ASST	AVERAGE SALARY: $ 502	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
EDIT OUTPUT	1	LOG OUTPUT	1	MONITORING	1	PROCESS INPUT DATA	1
UPDATE OUTPUT	2						
OPERATOR COMPUTER I	AVERAGE SALARY: $ 503	STANDARD DEVIATION: $ 31	PROMOTE PERCENT: 100				
BROADCAST MESSAGES	6	CLEAR CARD JAMS	1	COMPUTER JOBS	40	COORDINATE WORK FLOW	1
DISK, MOUNT	30	DISK, PREPARE LABELS	15	DISTRIBUTE OUTPUT	1	DISTRIBUTE REPORTS	1
FILE FINISHED WORK	1	FOLLOW INSTRUCTIONS	5	HOUSEKEEPING	1	JOB ASSISTANCE	3
KEYPUNCH CARDS	3	LOAD OUTPUT DEVICES	1	LOAD INPUT DEVICES	1	LOG MALFUNCTIONS	1
LOG WORK	2	LOG	1	MAINTAIN SECURITY	1	MONITOR TERMINAL	20
MONITOR SYSTEM	1	MONITOR EQUIPMENT	2	MONITORING	4	MONITOR INVENTORY	1
MOVE CARDS OR FORMS	1	MOVE TAPES	7	OPERATE COMPUTER	1	ORDER SUPPLIES	2
PRINTER, MOUNT LOOPS	8	PRINTER, LOAD FORMS	8	PRINTER, PREPARE	1	REFER TO FILES	1
RELAY INFORMATION	1	SOLVE PROBLEMS	2	SPECIAL ASSIGNMENTS	1	STORE FORMS OR CARDS	1
SYSTEM PREPARATION	1	TAPE, PREPARE LABELS	16	TAPE, BUILD BACK UP	1	TAPE, CLEAN DRIVES	16
TAPE, MOUNT	31	TELEPHONING	2	TYPE REPORTS	1	VERIFY CARDS	2
VERIFY OUTPUT VALIDI	1	VERIFY DATA	1	WRITE MEMOS	2	WRITE NOTES	1
TECHNICIAN EDP I	AVERAGE SALARY: $ 507	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
BURST FORMS	1	COMPUTER JOBS	6	DECOLLATE OUTPUT	1	FOLLOW INSTRUCTIONS	1
LOAD OUTPUT DEVICES	1	LOAD INPUT DEVICES	1	PRINTER, LOAD FORMS	1	REPLENISH SUPPLIES	1
SYSTEM PREPARATION	1	TAPE, PRINT	3	TAPE, BUILD BACK UP	1		

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

OPERATOR I DP	AVERAGE SALARY: $ 512		STANDARD DEVIATION: $ 5		PROMOTE PERCENT: 100				
KEY DATA	49	KEYPUNCH CARDS	11	VERIFY CARDS	6				
STENOGRAPHER SR	AVERAGE SALARY: $ 512		STANDARD DEVIATION: $ 27		PROMOTE PERCENT: 100				
BATCH FORMS	3	CALCULATE PAYROLL	1	COPY BLUEPRINTS	1	DELIVER FORMS	1		
FILE	3	INVENTORY SUPPLIES	1	LOG ATTENDANCE	1	MAIL, PICK UP	4		
MAIL, DISTRIBUTE	3	MAKE CHANGE	1	ORDER SUPPLIES	1	ORIENT EMPLOYEES	1		
POST REPORTS	2	PROCESS INPUT DATA	2	PROOFREAD	1	SORT FORMS	1		
TELEPHONING	3	TYPE REPORTS	14	TYPE FORMS	1	UPDATE MANUALS	4		
WRITE MEMOS	10	XEROXING	1						
OPERATOR KP SR	AVERAGE SALARY: $ 515		STANDARD DEVIATION: $ 64		PROMOTE PERCENT: 75				
CHANGE RIBBON	1	CORRECT INPUT DATA	25	EDIT INPUT DATA	25	INSTRUCT USERS	1		
INTERPRET CARDS	1	KEYPUNCH JOBS	48	KEYPUNCH PROGRAMS	1	TAPE, MOUNT	1		
TELEPHONING	1	VERIFY CARDS	27						
OPERATOR MACHINE DP	AVERAGE SALARY: $ 520		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100				
CALCULATE INVENTORY	4	DISTRIBUTE REPORTS	1	DISTRIBUTE SUPPLIES	1	MONITOR INVENTORY	1		
MOVE CARDS OR FORMS	5	PROCESS REPORTS	1	REPLENISH SUPPLIES	1	SALVAGE UNUSED STOCK	2		
OPERATOR COMPUTER SR	AVERAGE SALARY: $ 520		STANDARD DEVIATION: $ 30		PROMOTE PERCENT: 100				
ANSWER USER QUESTION	1	ASSIST USERS	1	DESIGN FORMS	1	DISTRIBUTE OUTPUT	2		
FILE TAPES	1	HOUSEKEEPING	2	MAINTAIN EQUIPMENT	2	MAINTAIN SECURITY	2		
MAINTAIN SYSTEMS	2	MONITOR TERMINAL	1	MONITOR WORK FLOW	1	MONITOR SYSTEM	2		
OPERATE PLOTTER	1	PRINTER, LOAD FORMS	1	RELIEVE SUPERVISOR	3	SEPARATE OUTPUT	1		
SPECIAL ASSIGNMENTS	1	TAKE TURN OVER	1	TAPE, CLEAN DRIVES	1	TRAIN OPERATORS	1		
WRITE MEMOS	1	WRITE FORMS	1						
DATA HANDLER	AVERAGE SALARY: $ 523		STANDARD DEVIATION: $ 51		PROMOTE PERCENT: 100				
BALANCE INPUT DATA	1	BURST FORMS	17	COMPUTER JOBS	76	DECOLLATE OUTPUT	22		
DELIVER COMPUTER JOB	1	EDIT FORMS	5	FILE TAPES	1	FOLLOW INSTRUCTIONS	1		
HOUSEKEEPING	5	INTERPRET CARDS	18	JOB ASSISTANCE	3	KEYPUNCH JOB CONTROL	3		
LIAISON	1	LOG COMPUTER TIME	2	MAINTAIN EQUIPMENT	2	OPERATE CARD EQUIPME	2		
PACKET JOBS	60	PROCESS PAPER TAPE	1	REPRODUCE CARDS	2	SEPARATE OUTPUT	2		
STORE FORMS OR CARDS	14	SYSTEM PREPARATION	1	TAPE, PREPARE	15	TAPE, BUILD BACK UP	1		
TAPE, PREPARE LABELS	3	TELEPROCESSING	1	WIRE CONTROL PANELS	2	WRITE PROGRAMS	1		
TECHNICIAN DATA CONT	AVERAGE SALARY: $ 525		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100				
BURST FORMS	1	CODE INPUT DATA	2	DECOLLATE OUTPUT	1	DISTRIBUTE WORK	5		
DISTRIBUTE OUTPUT	1	EDIT INPUT DATA	1	EDIT FORMS	3	FILE FORMS OR CARDS	1		
LOG DATA FLOW	5	LOG	2	MAIL, PREPARE	1	SCRAP CARDS	1		
SORT OUTPUT	1	STAMP FORMS	8	TAB, LIST CARDS	1	TRANSFER DATA	2		
OPERATOR COMPUTER JR	AVERAGE SALARY: $ 525		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100				
COMPUTER JOBS	2	DISTRIBUTE OUTPUT	3	FOLLOW INSTRUCTIONS	1	LOAD OUTPUT DEVICES	1		
LOAD INPUT DEVICES	1	MONITOR SYSTEM	2	PRINTER, CHANGE LOOP	1	TAPE, MOUNT	1		
TEST PROGRAMS	1								

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

ACCOUNTANT	AVERAGE SALARY: $ 526	STANDARD DEVIATION: $ 308	PROMOTE PERCENT: 75				
ANSWER QUESTIONS	1	BALANCE REPORTS	1	CALCULATE	1	CODE INPUT FORMS	1
EDIT OUTPUT	1	MAIL OUTPUT	1	MAINTAIN LOG	3	MATCH DATA	3
POST OUTPUT	3	PREPARE REPORTS	1	PROCESS CORRESPONDEN	2	PROCESS OUTPUT	37
REVIEW OUTPUT	1	SORT OUTPUT	1	TELEPHONING	1	UPDATE FILES	1
VERIFY INPUT DATA	2	VERIFY OUTPUT VALIDI	3	WRITE FORMS	1		
CLERK VERIFICATION	AVERAGE SALARY: $ 540	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
FILE OUTPUT	3	POST OUTPUT	2	SORT OUTPUT	1		
PROGRAMMER TRAINEE	AVERAGE SALARY: $ 545	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ATTEND MEETING	1	BALANCE REPORTS	2	BURST FORMS	4	CHANGE PROGRAMS	6
COMPUTER JOBS	2	DEBUG PROGRAMS	2	DOCUMENT PROGRAMS	2	KEYPUNCH JOB CONTROL	2
TEST PROGRAMS	2	UPDATE DOCUMENTATION	2	WRITE PROGRAMS	2		
MANAGER ADM SERVICES	AVERAGE SALARY: $ 545	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
APPROVE PAYMENTS	5	ASSIST USERS	2	ASSIGN WORK	20	ATTEND MEETING	2
CONSULT MANAGEMENT	2	EDIT REPORTS	2	HOUSEKEEPING	1	LIAISON	2
MAINTAIN FILES	4	MONITOR INVENTORY	2	REVIEW REPORTS	1	SELL SUPPLIES	1
SEPARATE OUTPUT	1	SUPERVISING	2	TELEPHONING	7	UPDATE FILES	10
VERIFY REPORTS	2	VERIFY OUTPUT VALIDI	1	WRITE MEMOS	1	WRITE LETTERS	1
CLERK TYPIST III	AVERAGE SALARY: $ 545	STANDARD DEVIATION: $ 26	PROMOTE PERCENT: 50				
ANSWERING SERVICE	1	BALANCE REPORTS	1	BALANCE INPUT DATA	1	CALCULATE PAYROLL	1
CODE INPUT DATA	1	COLLATE FORMS	1	COLLATE CARDS	1	COLLECT FORMS	1
CORRECT ERRORS	3	DELIVER FORMS	1	DISTRIBUTE OUTPUT	1	DISTRIBUTE WORK	1
EDIT INPUT DATA	2	FILE	3	FILE SOURCE DOCUMENT	1	KEYPUNCH CARDS	1
LOG TERMINAL USAGE	1	LOG	1	MAIL, SORT	1	MAIL, PICK UP	1
MOVE TAPES	1	OPERATE TERMINAL	2	POST FLOWCHART	1	RELIEVE EMPLOYEE	1
TELEPHONING	1	TYPE MEMOS	1	TYPE LETTERS	1	UPDATE OUTPUT	1
UPDATE LIBRARY	1	VERIFY REPORTS	1	WRITE FORMS	1		
ANALYST INV CTL	AVERAGE SALARY: $ 550	STANDARD DEVIATION: $ 49	PROMOTE PERCENT: 50				
ANSWER USER QUESTION	25	ASSIST PROGRAMMERS	1	BALANCE REPORTS	2	CODE INPUT FORMS	99
CONSULT PROGRAMMERS	5	CORRECT ERRORS	1	DELIVER COMPUTER JOB	15	FILE FORMS OR CARDS	4
JOB ASSISTANCE	2	MATCH DATA	2	PROCESS REPORTS	56	RECEIVE OUTPUT	1
SEPARATE OUTPUT	1	SEPARATE FORMS	1	STAMP FORMS	15	TELEPHONING	16
TRACE ERRORS	2	TRANSFER DATA	1	TYPE LETTERS	1	VERIFY DATA	1
VERIFICATION	1						
OPERATOR COMPUTER TR	AVERAGE SALARY: $ 550	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
CORRECT MALFUNCTION	1	CORRECT ERRORS	1	DELIVER COMPUTER JOB	4	FILE TAPES	1
FILE FORMS OR CARDS	1	KEYPUNCH CARDS	1	REPRODUCE CARDS	1	SCHEDULE COMPUTER TI	1
SORT CARDS	2	TAB, LIST CARDS	5	TAPE, CATALOG	1	TAPE, SELECT	1
TAPE, DISTRIBUTE	2	TRANSFER DATA	1				
OPERATOR KP LEAD	AVERAGE SALARY: $ 550	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
CORRECT ERRORS	1	INSTRUCT EMPLOYEES	1	MONITOR WORK FLOW	2	SORT FORMS	1
TELEPHONING	1						

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

CLERK STOCK II	AVERAGE SALARY: $ 559	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
BURST FORMS	10	DECOLLATE OUTPUT	16	DELIVER FORMS	2	DISTRIBUTE SUPPLIES	2
INVENTORY SUPPLIES	2	MOVE CARDS OR FORMS	1	ORDER SUPPLIES	1	REPLENISH SUPPLIES	1
STORE FORMS OR CARDS	1						
CLERK CASHIER	AVERAGE SALARY: $ 560	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
DISTRIBUTE REPORTS	1	MAIL OUTPUT	1	MAINTAIN FILES	1	PREPARE REPORTS	2
PROCESS OUTPUT	3	TYPE LETTERS	1	TYPE REPORTS	1		
EXPEDITER	AVERAGE SALARY: $ 565	STANDARD DEVIATION: $ 25	PROMOTE PERCENT: 50				
BALANCE OUTPUT	1	CODE INPUT FORMS	1	CODE INPUT DATA	3	EDIT OUTPUT	1
FILE OUTPUT	8	LOG BATCHES	1	MATCH DATA	1	MONITOR SYSTEM	1
PREPARE REPORTS	4	PROCESS OUTPUT	2	VERIFY OUTPUT VALIDI	1		
SUPERVISOR DATA PREP	AVERAGE SALARY: $ 572	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
APPROVE PAYMENTS	1	ASSIGN WORK	2	ASSIST PROGRAMMERS	1	ATTEND MEETING	1
CONSULTATION	1	COORDINATE WORK FLOW	1	COUNSEL EMPLOYEES	1	EVALUATE EMPLOYEES	2
FILE TAPES	1	IMPLEMENT SYSTEMS	1	INTERVIEW APPLICANTS	1	JOB ASSISTANCE	1
LIAISON	3	MAINTAIN LOG	1	MONITOR EQUIPMENT	1	ORDER SUPPLIES	1
PREPARE EMPLOYEE TRA	1	RELIEVE EMPLOYEE	1	REVIEW DOCUMENTATION	1	SCHEDULING	1
SUPERVISE PERSONNEL	1	TELEPHONING	2	TRAIN EMPLOYEES	1	TROUBLESHOOTING	1
UPDATE PROCEDURES	1	VERIFY WORK QUALITY	1	WRITE MEMOS	1		
CLERK DP	AVERAGE SALARY: $ 575	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
BALANCE INPUT DATA	1	FILE REPORTS	1	FILE MICROFILM	1	FOLLOW INSTRUCTIONS	1
INVENTORY SUPPLIES	1	MICROFILMING	2	POST	1	PREPARE REPORTS	5
RECEIVE CARDS	2	SEPARATE FORMS	3	SORT CARDS	1	TAPE, STORE	1
VERIFY DATA	1						
PROGRAMMER I	AVERAGE SALARY: $ 581	STANDARD DEVIATION: $ 265	PROMOTE PERCENT: 100				
ATTEND MEETING	8	CHANGE PROGRAMS	3	CONSULT SUPERVISORS	3	CONSULTATION	3
CORRECT ERRORS	3	DEBUG SYSTEMS	1	DEBUG PROGRAMS	6	DEVELOP PROGRAMS	1
DOCUMENT SYSTEMS	2	DOCUMENT PROGRAMS	7	FLOWCHART	1	FLOWCHART PROGRAMS	4
INTERPRET CARDS	3	KEYPUNCH JOB CONTROL	5	KEYPUNCH CARDS	4	PREPARE INPUT DATA	1
READ MANUALS	1	READ MEMOS	1	SCHEDULE COMPUTER TI	4	SPECIAL ASSIGNMENTS	1
STUDY	2	TEST PROGRAMS	5	TROUBLESHOOTING	1	UPDATE FILES	1
UPDATE DOCUMENTATION	2	UPDATE JOB CONTROL	1	VERIFY OUTPUT VALIDI	8	WRITE INSTRUCTIONS	2
WRITE FORMS	4	WRITE JOB CONTROL	2	WRITE PROGRAMS	10		

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

SUPERVISOR OPERATION AVERAGE SALARY: $ 582 STANDARD DEVIATION: $ 354 PROMOTE PERCENT: 62

TASK LIST OVERFLOW: SEE SUPPLEMENTARY REPORT.

SUPERVISOR PROGRAMMI AVERAGE SALARY: $ 583 STANDARD DEVIATION: $ 446 PROMOTE PERCENT: 66

ANALYZING	1	ASSIST PROGRAMMERS	1	ASSIGN WORK	11	ATTEND MEETING	2
CODE INPUT DATA	1	CONSULT PROGRAMMERS	1	CONSULT SUPERVISORS	1	CONSULT ANALYSTS	1
CONSULTATION	1	COORDINATE WORK FLOW	2	CORRECT ERRORS	1	DEBUG PROGRAMS	1
DESIGN FORMS	1	DEVELOP PROCEDURES	1	DOCUMENT PROGRAMS	1	ESTABLISH PRIORITIES	2
EVALUATE EMPLOYEES	1	FLOWCHART PROGRAMS	1	MAINTAIN PROGRAMS	1	MONITOR WORK FLOW	2
OPERATE COMPUTER	1	REVIEW DOCUMENTATION	1	REVIEW SYSTEMS	1	REVIEW WORK LOG	2
REVIEW SPECIFICATION	10	SUPERVISE PERSONNEL	1	TEST PROGRAMS	1	WRITE MEMOS	2
WRITE PROGRAMS	1						

PROGRAMMER JR AVERAGE SALARY: $ 585 STANDARD DEVIATION: $ 0 PROMOTE PERCENT: 100

ANALYZING	1	CLERICAL WORK	1	DEBUG PROGRAMS	1	DESIGN FILES	1
DESIGN DATA CODES	1	DEVELOP PROCEDURES	1	DOCUMENT PROGRAMS	2	REVIEW SYSTEMS	1
TEST PROGRAMS	1	TRAIN OPERATORS	1	UPDATE DOCUMENTATION	1	WRITE USER GUIDE	1
WRITE PROGRAMS	5						

TECHNICIAN EDP II AVERAGE SALARY: $ 587 STANDARD DEVIATION: $ 0 PROMOTE PERCENT: 100

COMPUTER JOBS	6	LOAD OUTPUT DEVICES	1	LOAD INPUT DEVICES	1	REPLENISH SUPPLIES	1
TELEPROCESSING	1	TEST PROGRAMS	4				

PROGRAMMER OPERATOR AVERAGE SALARY: $ 587 STANDARD DEVIATION: $ 87 PROMOTE PERCENT: 100

CHANGE PROGRAMS	4	CODE INPUT DATA	2	COLLATE CARDS	1	COMPUTER JOBS	8
DEBUG PROGRAMS	1	DISTRIBUTE REPORTS	1	INTERPRET CARDS	1	REPLENISH SUPPLIES	2
SORT CARDS	1	TAPE, BUILD BACK UP	1	TRACE ERRORS	1	WRITE PROGRAMS	1
WRITE FORMS	2						

PROGRAMMER II AVERAGE SALARY: $ 596 STANDARD DEVIATION: $ 355 PROMOTE PERCENT: 100

ASSIGN WORK	1	ASSIST USERS	1	ASSIST PROGRAMMERS	6	ATTEND MEETING	2
CHANGE SYSTEMS	2	CHANGE PROGRAMS	2	COLLECT DATA	1	COMMUNICATION, VERBA	1
CONSULT PROGRAMMERS	2	CONSULT SUPERVISORS	1	CONSULT USERS	2	CONSULT ANALYSTS	1
CONSULTATION	4	CORRECT ERRORS	1	DEBUG PROGRAMS	4	DELIVER FORMS	1
DESIGN SYSTEMS	1	DISK, PREPARE LABELS	2	DISTRIBUTE OUTPUT	2	DOCUMENT SYSTEMS	1
DOCUMENT PROGRAMS	1	EDIT OUTPUT	1	EVALUATE EMPLOYEES	1	FILE FORMS OR CARDS	4
FLOWCHART SYSTEMS	1	FLOWCHART PROGRAMS	2	JOB ASSISTANCE	1	KEYPUNCH CARDS	2
KEYPUNCH JOB CONTROL	2	LIAISON	1	MAINTAIN SYSTEMS	1	MAINTAIN PROGRAMS	1
MONITOR WORK FLOW	1	RECEIVE JOB REQUESTS	1	RELAY INFORMATION	2	REVIEW DOCUMENTATION	1
SCHEDULE COMPUTER TI	2	SPECIAL ASSIGNMENTS	1	SUPERVISE PERSONNEL	1	TAPE, DESIGN LAYOUT	1
TAPE, PREPARE LABELS	2	TEST PROGRAMS	2	TRAVEL	1	VERIFICATION	1
VERIFY OUTPUT VALIDI	1	WRITE LETTERS	1	WRITE INSTRUCTIONS	1	WRITE PROGRAMS	8

REPORTS CONTROL AVERAGE SALARY: $ 600 STANDARD DEVIATION: $ 0 PROMOTE PERCENT: 0

BALANCE INPUT DATA	1	BALANCE REPORTS	3	BURST FORMS	1	COLLECT DATA	1
DELIVER DATA	1	DISTRIBUTE REPORTS	6	EDIT INPUT DATA	1	FILE REPORTS	13
KEYPUNCH CARDS	1	LOG TOTALS	5	SCHEDULE COMPUTER TI	1	SEPARATE OUTPUT	1
STORE FORMS OR CARDS	1	TELEPHONING	1	VERIFY OUTPUT VALIDI	6	XEROXING	1

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

OPERATOR DATA CONVER	AVERAGE SALARY: $ 600	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ANSWER QUESTIONS	25	ASSIGN WORK	1	ATTEND MEETING	1	CLERICAL WORK	2
COMPUTER JOBS	2	DISTRIBUTE WORK	20	KEYPUNCH JOBS	5	ORDER SUPPLIES	2
PLANNING	1	RELIEVE OPERATORS	1	RUN ERRANDS	1	SORT CARDS	1
SUPERVISE PERSONNEL	1	TELEPHONING	15	TRAIN OPERATORS	2	VERIFY CARDS	1
VERIFY INPUT DATA	1						
ANALYST CONTROL II	AVERAGE SALARY: $ 600	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
ASSIST USERS	1	ASSIST PROGRAMMERS	1	ATTEND MEETING	1	BALANCE REPORTS	2
CALCULATE	1	CODE INPUT FORMS	1	COLLECT DATA	1	COMMUNICATION, VERBA	1
COMPUTER JOBS	20	CORRECT ERRORS	1	DISTRIBUTE REPORTS	1	DOCUMENT PROCEDURES	-1
EDIT INPUT DATA	1	FILE OUTPUT	1	FILE FORMS OR CARDS	1	KEYPUNCH JOB CONTROL	1
LOG BATCHES	1	POST	1	PREPARE INPUT DATA	1	PREPARE USER GUIDE	1
SORT CARDS	1	SORT OUTPUT	1	SORT FORMS	1	STAMP FORMS	1
TRACE ERRORS	1	TRAIN EMPLOYEES	1	VERIFY CARDS	1	VERIFY OUTPUT VALIDI	5
SUPERVISOR KP ASST	AVERAGE SALARY: $ 600	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ANSWER QUESTIONS	1	CLERICAL WORK	1	CORRECT ERRORS	1	DESIGN DRUM CARD	1
INSTRUCT EMPLOYEES	1	KEYPUNCH PROGRAMS	1	KEYPUNCH JOBS	19	LOG WORK	1
SORT CARDS	1	VERIFY CARDS	1				
OPERATOR MACHINE U R	AVERAGE SALARY: $ 605	STANDARD DEVIATION: $ 64	PROMOTE PERCENT: 100				
BALANCE REPORTS	5	BOX CARDS	1	BUILD BACK UP	1	COLLATE FORMS	1
COLLATE CARDS	23	CORRECT ERRORS	1	DISTRIBUTE REPORTS	1	EDIT INPUT DATA	3
FILE FORMS OR CARDS	2	INTERPRET CARDS	20	JOB ASSISTANCE	1	KEYPUNCH CARDS	11
LABELING	21	LOG	1	MAIL, PREPARE	1	OPERATE SYSTEM	1
PREPARE REPORTS	2	REPRODUCE CARDS	1	SEPARATE CARDS	3	SEPARATE OUTPUT	1
SORT CARDS	25	STORE FORMS OR CARDS	1	TAB, RUN TOTALS	5	TAB, LIST CARDS	2
TAKE TURN OVER	1	VERIFY DATA	1	VERIFY OUTPUT VALIDI	1	WIRE CONTROL PANELS	16
WRITE FORMS	1	WRITE MANUALS	1				
OPERATOR CRT DATA AN	AVERAGE SALARY: $ 605	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
BALANCE REPORTS	2	KEY DATA	1	OPERATE SYSTEM	1	OPERATE OFFICE EQUIP	1
PREPARE INPUT DATA	1	TRACE ERRORS	2				
TECHNICAL WRITER	AVERAGE SALARY: $ 608	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ASSIST USERS	1	EDIT FORMS	1	MAINTAIN SYSTEMS	1	MAINTAIN LIBRARY	2
MAINTAIN MANUALS	3	NEWSWRITING	1	OPERATE TERMINAL	1	SUPERVISING	4
UPDATE LIBRARY	1	UPDATE DOCUMENTATION	1	WRITE USER GUIDE	4		
OPERATOR COMPUTER II	AVERAGE SALARY: $ 610	STANDARD DEVIATION: $ 35	PROMOTE PERCENT: 100				
ASSIST OPERATORS	1	ASSIST USERS	1	BALANCE REPORTS	2	BURST FORMS	5
CARD TO TAPE CONVERS	1	CHANGE PROGRAMS	10	COMPUTER JOBS	23	COORDINATE WORK FLOW	3
CORRECT ERRORS	1	DISK, MOUNT	1	EDUCATE SELF	1	INTERPRET CARDS	5
JOB ASSISTANCE	1	LOAD OUTPUT DEVICES	1	LOAD INPUT DEVICES	1	MAINTAIN SECURITY	1
MONITOR SYSTEM	1	MONITORING	1	MONITOR WORK FLOW	2	OPERATE COMPUTER	2
PRINTER, CHANGE RIBB	1	PRINTER, LOAD FORMS	1	RELAY INFORMATION	1	RELIEVE EMPLOYEE	1
REPRODUCE CARDS	5	SORT CARDS	5	SYSTEM PREPARATION	3	TAKE TURN OVER	1
TAPE, FILE	1	TAPE, MAINTAIN	1	TAPE, UPDATE	10	TAPE, MOUNT	1
TELEPHONING	1	TEST PROGRAMS	20	TRACE ERRORS	1	TRAIN OPERATORS	1
WRITE PROGRAMS	1						

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

STATISTICIAN	AVERAGE SALARY: $ 618	STANDARD DEVIATION: $ 18	PROMOTE PERCENT: 50				
ANALYZE OUTPUT	3	ASSIGN WORK	1	CODE INPUT DATA	1	COORDINATE WORK FLOW	1
DESIGN FILES	1	DISTRIBUTE OUTPUT	1	FILE OUTPUT	1	FLOWCHART	1
KEYPUNCH CARDS	1	LOG COMPUTER TIME	1	PREPARE INPUT DATA	1	PREPARE REPORTS	1
PROCESS OUTPUT	2	SEPARATE OUTPUT	1	SORT FORMS	1	TAPE, SCRATCH	1
UPDATE INPUT DATA,	1	VERIFY OUTPUT VALIDI	1	WRITE FORMS	2		
CLERK JR	AVERAGE SALARY: $ 620	STANDARD DEVIATION: $ 29	PROMOTE PERCENT: 100				
BURST FORMS	1	COLLATE CARDS	1	DELIVER FORMS	1	DISTRIBUTE OUTPUT	1
FILE FORMS OR CARDS	2	INTERPRET CARDS	1	JOB ASSISTANCE	1	KEYPUNCH PROGRAMS	1
KEYPUNCH JOBS	8	MAIL, PREPARE	2	MAIL, PROCESS	2	MAINTAIN EQUIPMENT	1
ORDER SUPPLIES	3	RECEIVE CARDS	1	SORT CARDS	1	SPECIAL ASSIGNMENTS	1
CLERK FILE	AVERAGE SALARY: $ 620	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
BOX CARDS	1	COMPUTER JOBS	20	FILE FORMS OR CARDS	24	INTERPRET CARDS	2
JOB ASSISTANCE	1	LABELING	1	LOG COMPUTER TIME	20	MAIL, DISTRIBUTE	1
MAIL, PROCESS	1	PRINTER, CUT LOOPS	1	REPRODUCE CARDS	2	STORE FORMS OR CARDS	1
TAPE, PREPARE LABELS	1	TAPE, ROTATE	1	TELEPHONING	1	TYPE FORMS	1
XEROXING	1						
OPERATOR EDP II	AVERAGE SALARY: $ 630	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
BALANCE OUTPUT	1	BALANCE INPUT DATA	1	COLLATE CARDS	1	COMPUTER JOBS	11
DISK, MOUNT	1	INTERPRET CARDS	1	KEYPUNCH CARDS	1	REPLENISH SUPPLIES	1
SORT OUTPUT DATA	1	SORT INPUT DATA	1	SYSTEM PREPARATION	1	TAPE, PREPARE LABELS	1
TAPE, MOUNT	1	TAPE, CLEAN DRIVES	1	TELEPROCESSING	1		
BOOKKEEPER	AVERAGE SALARY: $ 635	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
PROCESS OUTPUT	2						
OPERATOR COMPUTER	AVERAGE SALARY: $ 635	STANDARD DEVIATION: $ 176	PROMOTE PERCENT: 64				

TASK LIST OVERFLOW; SEE SUPPLEMENTARY REPORT.

COORDINATOR JOB STRE	AVERAGE SALARY: $ 640	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ASSIGN WORK	1	COORDINATE WORK FLOW	10	CORRECT PROGRAMS	1	DISK, MOUNT	1
DISK, SET UP DRIVES	1	MONITOR WORK FLOW	1	REVIEW WORK LOG	1	REVIEW OPERATIONS	1
TAKE TURN OVER	1	WRITE FORMS	1				
ANALYST SYSTEMS CHIE	AVERAGE SALARY: $ 667	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ATTEND MEETING	1	CONDUCT MEETING	1	CONSULTATION	1	DESIGN SYSTEMS	1
STUDY	1	TEST SYSTEMS	1	WRITE PROGRAMS, SPEC	1		
TEACHER	AVERAGE SALARY: $ 667	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
COMPUTER JOBS	1	TEACH CLASS	1				
SUPERVISOR DP ASST	AVERAGE SALARY: $ 671	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ANSWERING SERVICE	1	ASSIGN WORK	1	COORDINATE WORK FLOW	1	DISK, COPY	1
EVALUATE EMPLOYEES	1	FILE TAPES	1	INTERPRET CARDS	1	KEYPUNCH JOB CONTROL	2
LOG WORK	1	MONITOR EQUIPMENT	1	ORDER SUPPLIES	1	SCRAP CARDS	1
SORT CARDS	2	TAPE, PREPARE LABELS	1	TRACE ERRORS	1	TRAIN OPERATORS	1
UPDATE FILES	2	VERIFY OUTPUT VALIDI	1	WRITE FORMS	2		

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

SUPERVISOR SYSTEMS A	AVERAGE SALARY: $ 673		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100						
APPROVE DOCUMENTATIO	2	ASSIST ANALYSTS	3	ASSIGN WORK	3	CONDUCT MEETING	1				
COORDINATING	1	DESIGN SYSTEMS	1	ESTABLISH STANDARDS	1	EVALUATE EMPLOYEES	1				
EXPLAIN SYSTEMS	3	IMPLEMENT SYSTEMS	1	ORAL PRESENTATIONS	1	PLAN SYSTEMS	3				
REVIEW DOCUMENTATION	2										
CLERK SPECIAL	AVERAGE SALARY: $ 680		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100						
MAIL, PROCESS	1	RELIEVE EMPLOYEE	1	SPECIAL ASSIGNMENTS	1	VERIFY PROGRAMS	1				
VERIFY KEYPUNCHED JO	7										
CASHIER	AVERAGE SALARY: $ 690		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100						
BALANCE OUTPUT	1	PROCESS OUTPUT	3								
SCHEDULER OPERATIONS	AVERAGE SALARY: $ 698		STANDARD DEVIATION: $ 51		PROMOTE PERCENT: 100						
ADJUST PRIORITIES	15	ASSIGN WORK	1	ATTEND MEETING	1	CHANGE PROGRAMS	1				
CONDUCT IN SERVICE T	1	CONSULT SUPERVISORS	9	COORDINATE WORK FLOW	4	DELIVER COMPUTER JOB	8				
DELIVER FORMS	1	DEVELOP PROGRAMS	1	DEVELOP EMPLOYEE TRA	1	ENFORCE POLICIES	1				
ESTABLISH PRIORITIES	1	EVALUATE EMPLOYEES	1	FILE	1	FILE TAPES	1				
FILE FORMS OR CARDS	1	INSTRUCT OPERATORS	1	INTERPRET CARDS	1	KEYPUNCH CARDS	1				
KEYPUNCH JOB CONTROL	1	LOG WORK	2	MAINTAIN PROGRAMS	1	MAINTAIN FILES	2				
MONITOR WORK FLOW	15	OPERATE COMPUTER	1	PREPARE REPORTS	1	RECEIVE JOB REQUESTS	1				
RELAY INFORMATION	1	RELIEVE OPERATORS	1	REPLENISH SUPPLIES	1	REVIEW PROGRAMS	2				
REVIEW WORK LOG	1	REVIEW PROCEDURES	1	SCHEDULING	1	SCHEDULE MAINTENANCE	1				
SCHEDULE COMPUTER TI	1	SUPERVISING	1	SYSTEM PREPARATION	1	TAPE, RELEASE	1				
TAPE, PREPARE LABELS	1	UPDATE SYSTEMS	1	VERIFY DATA	3	WRITE PROGRAMS	1				
WRITE PROCEDURES	1	WRITE LETTERS	1	WRITE INSTRUCTIONS	1	WRITE MEMOS	1				
NURSE GENERAL III	AVERAGE SALARY: $ 700		STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100						
ATTEND MEETING	3	CODE INPUT DATA	5	COLLECT DATA	1	CONSULT USERS	1				
DESIGN SYSTEMS	2	DOCUMENT PROGRAMS	1	INVENTORY SUPPLIES	1	JOB ASSISTANCE	3				
KEYPUNCH PROGRAMS	1	LOG COMPUTER TIME	3	MAINTAIN SYSTEMS	1	MAINTAIN PROGRAMS	1				
OPERATE TERMINAL	1	SORT FORMS	1	TELEPHONING	1	UPDATE MANUALS	1				
UPDATE FILES	2	WRITE PROGRAMS	1	WRITE PROGRAMS, SPEC	3						
SUPERVISOR SHIFT	AVERAGE SALARY: $ 702		STANDARD DEVIATION: $ 34		PROMOTE PERCENT: 33						
ASSIST USERS	27	ASSIGN WORK	2	BURST FORMS	1	CLEAR PAPER JAMS	10				
CLEAR CARD JAMS	10	CONSULT USERS	1	CONSULT PROGRAMMERS	1	CONSULT SUPERVISORS	2				
COORDINATE WORK FLOW	2	DECOLLATE OUTPUT	1	DISK, PREPARE LABELS	1	DISK, MOUNT	1				
DISK, MAINTAIN	1	DISTRIBUTE OUTPUT	15	ENFORCE POLICIES	1	ESTABLISH PRIORITIES	5				
INSTRUCT OPERATORS	6	INTERPRET CARDS	1	INVENTORY SUPPLIES	1	LOG MALFUNCTIONS	1				
LOG TAPES	4	MAINTAIN SYSTEMS	1	MONITOR SYSTEM	10	MONITOR WORK FLOW	1				
OPERATE SYSTEM	1	PLAN WORK SCHEDULE	1	PREPARE REPORTS	1	PRINTER, CHANGE RIBB	1				
RELIEVE OPERATORS	1	SCHEDULING	1	SCHEDULE COMPUTER TI	4	SEPARATE OUTPUT	15				
SORT CARDS	1	SPECIAL ASSIGNMENTS	8	STORE FORMS OR CARDS	2	TAPE, MOUNT	1				
TAPE, CLEAN	1	TAPE, PREPARE LABELS	2	TELEPHONING	2	TRAIN OPERATORS	1				
UPDATE LOG	1	UPDATE LIBRARY	1	WRITE MEMOS	1						

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

PROGRAMMER AVERAGE SALARY: $ 704 STANDARD DEVIATION: $ 201 PROMOTE PERCENT: 94

TASK LIST OVERFLOW; SEE SUPPLEMENTARY REPORT.

COORDINATOR HOSPITAL AVERAGE SALARY: $ 739 STANDARD DEVIATION: $ 289 PROMOTE PERCENT: 25

TASK LIST OVERFLOW; SEE SUPPLEMENTARY REPORT.

ANALYST TRAFFIC	AVERAGE SALARY: $ 739	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ANALYZE OUTPUT	1	ANSWER QUESTIONS	1	BURST FORMS	1	CONSULT PROGRAMMERS	3
INTERPRET CARDS	1	LIAISON	1	MONITOR WORK FLOW	1	OPERATE PLOTTER	1
OPERATE COMPUTER	2	PREPARE REPORTS	3	PREPARE INPUT DATA	4	REVIEW PROGRAMS	1
SORT CARDS	1	SPECIAL ASSIGNMENTS	1	UPDATE LIBRARY	1	UPDATE PROCEDURES	1
VERIFY OUTPUT VALIDI	1	WRITE PROGRAMS	3				
SUPERVISOR DATA CONT	AVERAGE SALARY: $ 748	STANDARD DEVIATION: $ 76	PROMOTE PERCENT: 50				
ASSIGN WORK	1	ATTEND MEETING	3	BALANCE REPORTS	1	BURST FORMS	1
CODE INPUT DATA	1	COMMUNICATION, VERBA	2	CONSULT SUPERVISORS	3	CONSULT OPERATORS	2
DECOLLATE OUTPUT	1	DISTRIBUTE REPORTS	2	EDIT REPORTS	1	EDIT INPUT DATA	2
ESTABLISH PRIORITIES	1	FILE REPORTS	1	FILE OUTPUT	1	FILE FORMS OR CARDS	1
FILE TAPES	1	LOG WORK	2	LOG	1	MONITOR WORK FLOW	2
PLANNING	12	RECEIVE JOB REQUESTS	1	RELAY INFORMATION	1	SPECIAL ASSIGNMENTS	1
SUPERVISING	1	SUPERVISE PERSONNEL	1	TELEPHONING	1	TRACE ERRORS	3
TRANSFER DATA	1	UPDATE PROCEDURES	1	VERIFY DATA	1	WRITE FORMS	1
WRITE REPORTS	12						
PROGRAMMER LEAD	AVERAGE SALARY: $ 750	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ASSIST OPERATORS	1	ASSIST SUPERVISORS	1	COLLECT FORMS	1	CONSULT SUPERVISORS	1
CORRECT PROGRAMS	20	DEVELOP PROGRAMS	7	DISTRIBUTE REPORTS	1	DOCUMENT PROGRAMS	4
KEYPUNCH CARDS	5	KEYPUNCH PROGRAMS	4	MAINTAIN SYSTEMS	1	TEST PROGRAMS	30
VERIFY OUTPUT VALIDI	1	WRITE INSTRUCTIONS	8	WRITE PROGRAMS	2		
DETAILER	AVERAGE SALARY: $ 750	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
PLANNING	1	PREPARE INPUT DATA	2				
TELECOM OPERATIONS S	AVERAGE SALARY: $ 750	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
COMMUNICATION, VERBA	1	CONDUCT MEETING	1	DELIVER FORMS	1	EDUCATE SELF	1
EDUCATE TERMINAL USE	3	INSTRUCT TERMINAL US	10	PREPARE REPORTS	3	REVIEW PROCEDURES	1
TELEPHONING	15	UPDATE MANUALS	1	VERIFY OUTPUT VALIDI	1	WRITE MEMOS	5
WRITE USER GUIDE	3	WRITE INSTRUCTIONS	2				
COORDINATOR DP ACCTG	AVERAGE SALARY: $ 750	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
COMPUTER JOBS	1	CONSULT USERS	1	DOCUMENTATION	1	EDUCATE SELF	1
ESTABLISH POLICIES	1	FEASIBILITY STUDY	1	MAINTAIN PROGRAMS	1	MAINTAIN SYSTEMS	1
MONITOR OUTPUT	1	ORDER SUPPLIES	1	PLAN SYSTEMS	1	REVIEW MANUALS	1
SCHEDULING	1	SOLVE PROBLEMS	1	TEST PROGRAMS	1	TRAIN EMPLOYEES	1
UPDATE MANUALS	2	UPDATE LIBRARY	1	WRITE MANUALS	1	WRITE PROGRAMS	1
SCHEDULER JOB	AVERAGE SALARY: $ 760	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
CHANGE JOB CONTROL	1	COMMUNICATION, VERBA	1	COORDINATE WORK FLOW	1	CORRECT ERRORS	1
EDUCATE SELF	1	JOB ASSISTANCE	4	KEY DATA	1	LOG WORK	1
MAINTAIN FILES	4	MONITOR TERMINAL	1	MONITOR WORK FLOW	2	SPECIAL ASSIGNMENTS	1
SUPERVISE PERSONNEL	1	SYSTEM PREPARATION	4	TAPE, PREPARE LABELS	1	TEST PROGRAMS	1
TRAIN OPERATORS	1	UPDATE JOB CONTROL	1	WRITE MEMOS	1		
DETAILER SR	AVERAGE SALARY: $ 788	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				

TABLE V (Continued)

PLANNING	1	PREPARE INPUT DATA	1	PROCESS OUTPUT	1	REVIEW MANUALS	1
VERIFY INPUT DATA	1						

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

ANALYST RESEARCH	AVERAGE SALARY: $ 793	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
ANALYZE OUTPUT	1	ASSIGN WORK	1	CODE INPUT DATA	1	CONDUCT RESEARCH	1
COORDINATING	1	DESIGN TESTS	1	DESIGN OUTPUT FORMAT	1	DEVELOP INPUT DATA	1
FLOWCHART PROCEDURES	1	KEYPUNCH CARDS	1	PREPARE REPORTS	1	VERIFY CARDS	1
SUPERVISOR SECTION	AVERAGE SALARY: $ 800	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
ATTEND MEETING	3	COMMUNICATION, VERBA	2	COORDINATE MAINTENAN	1	JOB ASSISTANCE	1
MONITOR WORK FLOW	1	PREPARE EMPLOYEE TRA	1	RECEIVE INSTRUCTIONS	1	SCHEDULE COMPUTER TI	1
SOLVE PROBLEMS	1	SPECIAL ASSIGNMENTS	1	SUPERVISE PERSONNEL	1	TEST PROGRAMS	1
WRITE JOB DESCRIPTIO	1						
OPERATOR MASTER	AVERAGE SALARY: $ 800	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
ANALYZE PROBLEMS	1	ANALYZING	2	ASSIST OPERATORS	1	ASSIST PROGRAMMERS	1
ATTEND MEETING	1	COMMUNICATION, VERBA	1	COMPUTER JOBS	2	CONSULTATION	1
CORRECT ERRORS	1	DESIGN SYSTEMS	1	EVALUATE SYSTEMS	1	JOB ASSISTANCE	2
LIAISON	1	MONITOR SYSTEM	1	SCHEDULE COMPUTER TI	1	TRACE ERRORS	1
TRAIN OPERATORS	1	VERIFY WORK QUALITY	1				
CLERK SR	AVERAGE SALARY: $ 800	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
BALANCE REPORTS	1	CODE INPUT DATA	1	EDIT INPUT DATA	1	LOG	1
RECEIVE SOURCE DOCUM	1	TELEPHONING	1				
ADMINISTRATIVE ASSIS	AVERAGE SALARY: $ 800	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
ANALYZE SYSTEMS	1	ANSWER USER QUESTION	1	ASSIST USERS	1	COMPUTER JOBS	1
DESIGN SYSTEMS	1	DEVELOP PROGRAMS	1	PREPARE REPORTS	1	PROCESS CORRESPONDEN	2
SUPERVISING	1	WRITE PROGRAMS	1				
COORDINATOR NURSING	AVERAGE SALARY: $ 800	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
ATTEND MEETING	3	CODE INPUT DATA	1	COLLECT DATA	1	CONDUCT IN SERVICE T	1
COORDINATE WORK FLOW	1	CORRECT ERRORS	5	DELIVER DATA	1	EDIT INPUT DATA	1
JOB ASSISTANCE	2	LOG TERMINAL USAGE	1	OPERATE TERMINAL	2	READ	1
RELIEVE EMPLOYEE	2	VERIFY DATA	1	WRITE MEMOS	1		
ANALYST TRAFFIC SR	AVERAGE SALARY: $ 800	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 0			
ANALYZE OUTPUT	2	ANSWER QUESTIONS	2	PREPARE REPORTS	1	PROCESS CORRESPONDEN	1
SPECIAL ASSIGNMENTS	3						
INSTRUCTOR	AVERAGE SALARY: $ 800	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
ANALYZE SYSTEMS	1	ASSIGN WORK	1	CONSULT SUPERVISORS	2	COORDINATE OPERATION	5
DESIGN CARD LAYOUTS	1	DESIGN SYSTEMS	1	MAINTAIN SYSTEMS	1	ORDER SUPPLIES	1
TEACH CLASS	1	WRITE PROGRAMS	1				

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

PROGRAMMER ANALYST AVERAGE SALARY: $ 814 STANDARD DEVIATION: $ 327 PROMOTE PERCENT: 69

TASK LIST OVERFLOW; SEE SUPPLEMENTARY REPORT.

SUPERVISOR DP	AVERAGE SALARY: $ 822	STANDARD DEVIATION: $ 239	PROMOTE PERCENT: 25	
ANALYZE SYSTEMS	1	ANSWER QUESTIONS	2	ASSIGN WORK	2	ASSIST PROGRAMMERS	1
COMPUTER JOBS	4	COORDINATE WORK FLOW	2	CORRECT PROGRAMS	1	DEBUG PROGRAMS	1
DESIGN CARD LAYOUTS	1	DESIGN FORMS	3	DISTRIBUTE OUTPUT	1	DOCUMENT PROCEDURES	1
EDIT INPUT DATA	1	ESTABLISH STANDARDS	1	EVALUATE EMPLOYEES	2	INTERVIEW APPLICANTS	1
INVENTORY SUPPLIES	1	JOB ASSISTANCE	1	KEYPUNCH PROGRAMS	1	LOG WORK	2
LOG ATTENDANCE	1	LOG	1	OPERATE CARD EQUIPME	1	ORDER SUPPLIES	3
PREPARE REPORTS	1	PREPARE USER GUIDE	1	RECEIVE SALESMEN	1	RECEIVE TRAINING	1
SUPERVISE PERSONNEL	2	SUPERVISE OPERATIONS	1	SUPERVISING	2	TELEPHONING	1
TRAIN OPERATORS	1	TYPE MEMOS	1	UPDATE REPORTS	1	UPDATE FILES	1
UPDATE LOG	1	UPDATE PROCEDURES	1	VERIFY WORK QUALITY	2	VERIFY OUTPUT VALIDI	1
WIRE CONTROL PANELS	2	WRITE JOB DESCRIPTIO	1	WRITE MEMOS	1	WRITE PROGRAMS	2

AUDITOR JR	AVERAGE SALARY: $ 825	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0	
BALANCE REPORTS	4	COLLATE CARDS	1	COMPUTER JOBS	1	CORRECT ERRORS	1
FILE FORMS OR CARDS	1	INTERPRET CARDS	1	PREPARE REPORTS	1	REPRODUCE CARDS	1
SORT CARDS	1						

COORDINATOR DP AVERAGE SALARY: $ 826 STANDARD DEVIATION: $ 61 PROMOTE PERCENT: 66

TASK LIST OVERFLOW; SEE SUPPLEMENTARY REPORT.

AUDITOR	AVERAGE SALARY: $ 828	STANDARD DEVIATION: $ 134	PROMOTE PERCENT: 75	
ADJUST INVENTORY	1	ANALYZING	3	ANALYZE OUTPUT	6	ANSWER QUESTIONS	25
CONDUCT MEETING	1	CONSULT MANAGEMENT	1	COORDINATE OPERATION	1	CORRECT ERRORS	4
DESIGN INPUT FORMS	1	DESIGN SYSTEMS	1	DEVELOP PROCEDURES	1	DISTRIBUTE OUTPUT	4
EDIT FORMS	3	EDIT OUTPUT	3	EXTRACT DATA	1	FEASIBILITY STUDY	1
FLOWCHART	1	IMPLEMENT SYSTEMS	1	INVENTORY SUPPLIES	1	MAINTAIN LEDGERS	4
MONITOR SYSTEM	1	MONITOR INVENTORY	10	PREPARE REPORTS	2	PREPARE INPUT DATA	1
PROCESS INPUT DATA	2	PROCESS OUTPUT	7	RECEIVE LEDGERS	4	RECOMMEND CHANGES	1
REVIEW PROCEDURES	1	REVIEW SYSTEMS	1	SEPARATE OUTPUT	2	SPECIAL ASSIGNMENTS	7
SUPERVISE PERSONNEL	1	TELEPHONING	1	TRACE ERRORS	5	TRANSFER DATA	1
UPDATE PROCEDURES	1	UPDATE OUTPUT	4	VERIFY OUTPUT VALIDI	2	WRITE LETTERS	1
WRITE MEMOS	1						

MANAGER	AVERAGE SALARY: $ 834	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0	
ANSWER QUESTIONS	1	APPROVE MAINTENANCE	1	ATTEND SEMINAR	1	ATTEND MEETING	3
CONDUCT TOURS	1	CONDUCT MEETING	1	DESIGN FORMS	1	INTERVIEW APPLICANTS	1
ORDER SUPPLIES	1	ORDER EQUIPMENT	1	PREPARE BUDGET	2	REVIEW REQUESTS	1
SELECT PERSONNEL	1	TEACH CLASS	1	TELEPHONING	1	TROUBLESHOOTING	1
WRITE MANUALS	1						

SUPERVISOR DP SYSTEM	AVERAGE SALARY: $ 834	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100	
ANALYZE PROBLEMS	1	ANSWER QUESTIONS	1	CHANGE SYSTEMS	1	CONSULT USERS	1
CONSULT PROGRAMMERS	1	CONSULTATION	2	DESIGN FORMS	1	DOCUMENT SYSTEMS	1
OPERATE COMPUTER	1	ORDER SUPPLIES	1	REVIEW SYSTEMS	1	SUPERVISE PERSONNEL	1
TELEPHONING	1	TEST SYSTEMS	1	TEST PROGRAMS	1	TRACE ERRORS	1
VERIFY OUTPUT VALIDI	1	WRITE PROGRAMS	1	WRITE INSTRUCTIONS	2		

ANALYST SYSTEMS II	AVERAGE SALARY: $ 843	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100	
ANALYZE SYSTEMS	2	ANALYZE PROGRAMS	2	ASSIGN WORK	1	CONSULT USERS	1
DESIGN OUTPUT FORMAT	1	DESIGN INPUT FORMATS	1	DOCUMENT SYSTEMS	1	DOCUMENT PROGRAMS	1

TABLE V (Continued)

FLOWCHART	1	JOB ASSISTANCE	1	OPERATE COMPUTER	1	RECOMMEND CHANGES	1
REVIEW DOCUMENTATION	1	SCHEDULE COMPUTER TI	1	TEST SYSTEMS	1	TEST PROGRAMS	2

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

ANALYST SYSTEMS I	AVERAGE SALARY: $ 896	STANDARD DEVIATION: $ 104	PROMOTE PERCENT: 100		
ANSWER USER QUESTION	2	ASSIST SUPERVISORS	1	ASSIST PROGRAMMERS	1	CODE INPUT DATA	1
CONSULTATION	1	CONSULT SUPERVISORS	1	CONSULT MANAGEMENT	1	CONSULT USERS	1
CORRECT ERRORS	4	DESIGN JOB CONTROL	1	DESIGN OUTPUT FORMAT	2	DESIGN INPUT FORMATS	3
DISTRIBUTE REPORTS	1	DISTRIBUTE OUTPUT	2	DOCUMENT SYSTEMS	1	DOCUMENT PROGRAMS	1
FEASIBILITY STUDY	2	FLOWCHART SYSTEMS	1	INSTRUCT USERS	1	JOB ASSISTANCE	1
KEYPUNCH CARDS	1	OPERATE COMPUTER	1	PREPARE REPORTS	1	REVIEW SYSTEMS	3
TEST PROGRAMS	1	UPDATE SYSTEMS	3	VERIFICATION	1	VERIFY WORK QUALITY	1
WRITE MEMOS	1	WRITE FORMS	1	WRITE PROGRAMS	1	WRITE USER GUIDE	4
WRITE PROGRAMS, SPEC	1						

DIRECTOR ADM SYSTEMS	AVERAGE SALARY: $ 900	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100		
ATTEND MEETING	2	CHANGE SYSTEMS	1	CONSULT COORDINATORS	5	DESIGN FLOORPLAN	2
DESIGN SYSTEMS	1	EXPAND FACILITIES	2	SOLVE PROBLEMS	2	STUDY	1
SUPERVISE PERSONNEL	1	TEST SYSTEMS	1	TRACE MALFUNCTION	2	WRITE PROGRAMS	1

SUPERVISOR	AVERAGE SALARY: $ 910	STANDARD DEVIATION: $ 232	PROMOTE PERCENT: 33		
ANSWER QUESTIONS	1	APPROVE PAYMENTS	1	ASSIGN WORK	5	BALANCE REPORTS	1
BURST FORMS	1	CALCULATE PAYROLL	2	CODE INPUT DATA	1	COMPUTER JOBS	1
CONDUCT MEETING	1	CONSULT PROGRAMMERS	1	CONSULTATION	2	COORDINATE WORK FLOW	1
DISTRIBUTE OUTPUT	1	EDIT OUTPUT	3	EVALUATE EMPLOYEES	1	FILE FORMS OR CARDS	1
IMPLEMENT SYSTEMS	1	JOB ASSISTANCE	2	LIAISON	3	LOG ATTENDANCE	1
LOG	1	MAIL, PREPARE	3	MATCH DATA	2	OPERATE MTST	1
ORDER SUPPLIES	2	PLANNING	1	PREPARE USER GUIDE	1	PREPARE REPORTS	3
PROCESS INPUT DATA	1	PROCESS CORRESPONDEN	2	PROCESS OUTPUT	3	RECEIVE CARDS	1
RECOMMEND PROMOTIONS	1	REVIEWING	1	SCHEDULE COMPUTER TI	3	SELECT PERSONNEL	1
SEPARATE OUTPUT	3	SORT CARDS	1	STORE FORMS OR CARDS	1	SUPERVISE OPERATIONS	1
SUPERVISING	2	SUPERVISE PERSONNEL	3	TELEPHONING	2	UPDATE PROCEDURES	1
UPDATE REPORTS	2	VERIFY INPUT DATA	1	VERIFY OUTPUT VALIDI	3	WRITE REPORTS	4

ANALYST SYSTEMS	AVERAGE SALARY: $ 911	STANDARD DEVIATION: $ 213	PROMOTE PERCENT: 100		
ANALYZE PROGRAMS	1	ANALYZE SYSTEMS	2	APPROVE DOCUMENTATIO	1	ASSIST PROGRAMMERS	2
ASSIGN WORK	2	ATTEND MEETING	2	CHANGE PROGRAMS	1	CONDUCT MEETING	2
CONSULT USERS	1	DEBUG PROGRAMS	2	DESIGN SYSTEMS	7	DOCUMENT SYSTEMS	2
FILE OUTPUT	1	IMPLEMENT SYSTEMS	5	INSTRUCT EMPLOYEES	1	JOB ASSISTANCE	1
KEYPUNCH CARDS	1	MONITOR SYSTEM	2	OPERATE TERMINAL	10	ORAL PRESENTATIONS	1
ORIENT EMPLOYEES	1	REVIEW OUTPUT	2	REVIEW DOCUMENTATION	1	REVIEW REPORTS	1
REVIEW SYSTEMS	4	REVIEW PROGRAMS	4	SCHEDULING	1	SOLVE PROBLEMS	1
SPECIAL ASSIGNMENTS	1	STUDY	3	SUPERVISE PERSONNEL	1	TELEPHONING	3
TEST PROGRAMS	1	TEST SYSTEMS	1	TYPE	4	UPDATE DOCUMENTATION	1
UPDATE LIBRARY	1	UPDATE FILES	1	VERIFY OUTPUT VALDIT	1	VERIFICATION	2
WRITE PROGRAMS, SPEC	1	WRITE MANUALS	1	WRITE FORMS	1	WRITE MEMOS	3
WRITE USER GUIDE	3						

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

PROGRAMMER ENGNR	AVERAGE SALARY: $ 926	STANDARD DEVIATION: $ 143	PROMOTE PERCENT: 59				
ANALYZE SYSTEMS	1	ANSWER QUESTIONS	5	ARRANGE TRAVEL	1	ASSIST PROGRAMMERS	1
ASSIGN WORK	17	ASSIST USERS	14	ATTEND MEETING	1	CALCULATE	4
CHANGE PROGRAMS	1	COLLATE CARDS, MANUA	2	COMPUTER JOBS	1	CONSULTATION	3
CONSULT USERS	4	CORRECT INPUT DATA	1	CORRECT PROGRAMS	2	DEBUG PROGRAMS	3
DESIGN INPUT FORMS	1	DESIGN SYSTEMS	1	DOCUMENT PROGRAMS	6	EDIT INPUT DATA	1
EDUCATE USERS	1	FILE FORMS OR CARDS	1	FLOWCHART PROGRAMS	1	INSTRUCT USERS	2
INTERPRET CARDS	2	KEYPUNCH CARDS	11	LIAISON	6	LOG COMPUTER TIME	1
MAIL OUTPUT	2	OPERATE PLOTTER	1	PLANNING	1	PREPARE REPORTS	1
PROCESS CORRESPONDEN	1	REFER TO FILES	1	SOLVE PROBLEMS	2	SPECIAL ASSIGNMENTS	1
STUDY	4	TECHNICAL ADVICE	1	TELEPHONING	7	TEST PROGRAMS	2
TRAIN EMPLOYEES	1	UPDATE LIBRARY	1	UPDATE INPUT DATA	1	VERIFY WORK QUALITY	1
WRITE PROGRAMS, SPEC	1	WRITE INSTRUCTIONS	1	WRITE JOB CONTROL	5	WRITE PROGRAMS	6
WRITE LETTERS	7						
PROGRAMMER SYSTEMS	AVERAGE SALARY: $ 950	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ASSIST PROGRAMMERS	5	ATTEND MEETING	1	DESIGN SYSTEMS	1	DOCUMENTATION	2
EDUCATE SELF	1	IMPLEMENT SYSTEMS	2	MAINTAIN SOFTWARE	1	READ MANUALS	1
TEST PROGRAMS	2	UPDATE FILES	1	UPDATE LIBRARY	2	WRITE PROGRAMS	1
ANALYST SYSTEMS III	AVERAGE SALARY: $ 950	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ASSIGN WORK	1	ATTEND MEETING	1	CONSULT SUPERVISORS	1	CONSULT USERS	1
COORDINATE SYSTEMS	2	DESIGN FORMS	2	DOCUMENT SYSTEMS	2	ESTABLISH STANDARDS	1
EVALUATE EMPLOYEES	1	FLOWCHART SYSTEMS	1	LOG WORK	1	LOG ATTENDANCE	1
OPERATE COMPUTER	1	REVIEW SYSTEMS	1	REVIEW DOCUMENTATION	1	WRITE PROGRAMS	1
WRITE MEMOS	1						
PROGRAMMER III	AVERAGE SALARY: $ 954	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ANSWER USER QUESTION	1	ASSIST USERS	1	ASSIST PROGRAMMERS	1	ATTEND MEETING	4
CONSULT SUPERVISORS	1	DEBUG PROGRAMS	1	DESIGN FILES	1	DESIGN OUTPUT FORMAT	1
DESIGN INPUT FORMATS	1	DOCUMENT PROGRAMS	1	DOCUMENT SYSTEMS	1	FLOWCHART PROGRAMS	1
FLOWCHART SYSTEMS	1	MAINTAIN PROGRAMS	1	MONITOR WORK FLOW	1	PLANNING	1
RECEIVE INSTRUCTIONS	1	RELAY INFORMATION	1	STUDY	1	TEST PROGRAMS	1
WRITE PROGRAMS	1						
SYSTEMS DESIGNER	AVERAGE SALARY: $ 984	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ANALYZING	3	CONDUCT MEETING	1	CONSULT MANAGEMENT	1	DEVELOP SYSTEMS	1
DEVELOP PROCEDURES	1	DOCUMENT PROCEDURES	1	EDUCATE SELF	1	ESTABLISH POLICIES	1
EVALUATING	1	FLOWCHART	1	PLAN MEETINGS	1	SPECIAL ASSIGNMENTS	1
STUDY	1	TECHNICAL ADVICE	1	TEST PROGRAMS	1	TRACE ERRORS	1
TRAIN EMPLOYEES	1						

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

ENGINEER	AVERAGE SALARY: $ 989	STANDARD DEVIATION: $ 470		PROMOTE PERCENT: 100			
ANALYZE OUTPUT	1	ANSWER QUESTIONS	3	ASSIGN WORK	3	ATTEND MEETING	1
CODE INPUT FORMS	1	CODE INPUT DATA	3	COMMUNICATION, VERBA	1	CONSULT PROGRAMMERS	1
COORDINATING	1	DELIVER FORMS	1	DESIGN FORMS	1	DEVELOP PROCEDURES	3
DEVELOP DESIGNS	1	DEVELOP PROGRAMS	1	EDIT REPORTS	1	INSTRUCT PROGRAMMERS	1
JOB ASSISTANCE	1	LIAISON	2	ORAL PRESENTATIONS	2	PLANNING	1
PREPARE REPORTS	3	PREPARE INPUT DATA	4	PROCESS CORRESPONDEN	1	RELIEVE EMPLOYEE	1
REVIEW PROCEDURES	1	REVIEW REPORTS	5	REVIEW PROGRAMS	1	REVIEW OUTPUT	2
STUDY	1	SUPERVISE PERSONNEL	3	SUPERVISE OPERATIONS	1	SUPERVISING	3
TECHNICAL ADVICE	2	TRAVEL	2	UPDATE OUTPUT	1	UPDATE MANUALS	1
VERIFY OUTPUT VALIDI	2	WRITE LETTERS	1				
PROCESSOR PLANS	AVERAGE SALARY: $ 991	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 0			
PREPARE INPUT DATA	1	REVIEWING	1	WRITE REPORTS	1		
ANALYST RESEARCH OPE	AVERAGE SALARY: $ 1000	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
ANALYZE PROGRAMS	1	ANALYZING	3	ASSIST PROGRAMMERS	10	ASSIST ENGINEERING	10
CHANGE SYSTEMS	1	CONSULTATION	4	CORRECT MALFUNCTION	2	DESIGN FILES	1
DEVELOP PROGRAMS	1	DOCUMENT PROCEDURES	1	FLOWCHART SYSTEM	2	LIAISON	1
PLANNING	10	READ	1	SOLVE PROBLEMS	1	STUDY	1
TELEPHONING	3	TEST PROGRAMS	5	TRACE MALFUNCTION	2	WRITE PROGRAMS, SPEC	10
WRITE PROGRAMS	6	WRITE USER GUIDE	1				
DIRECTOR DP	AVERAGE SALARY: $ 1000	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 50			
ANSWER QUESTIONS	1	APPOINT COMMITTEES	1	ATTEND MEETING	1	AUTHORIZE PAYMENTS	1
COMMUNICATION, VERBA	2	CONDUCT MEETING	1	CONSULT MANUFACTURER	1	COORDINATE SYSTEMS	1
COORDINATE WORK FLOW	1	DESIGN SYSTEMS	1	DESIGN FLOORPLAN	1	ESTABLISH PRIORITIES	1
ESTABLISH STANDARDS	3	EVALUATING	1	EVALUATE EMPLOYEES	1	FEASIBILITY STUDY	1
IMPLEMENT SYSTEMS	2	INTERVIEW APPLICANTS	1	LIAISON	3	MONITOR WORK FLOW	1
ORAL PRESENTATIONS	1	PREPARE BUDGET	3	PROCESS CORRESPONDEN	1	SOLVE PROBLEMS	1
SPECIAL ASSIGNMENTS	2	SUPERVISE OPERATIONS	1	WRITE FORMS	1	WRITE PROGRAMS	1
MANAGER SYSTEMS PROG	AVERAGE SALARY: $ 1000	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 0			
ASSIGN WORK	1	ASSIST PROGRAMMERS	1	CONSULT USERS	1	CONSULT PROGRAMMERS	1
FEASIBILITY STUDY	1	LOG WORK	1	REVIEW DOCUMENTATION	1	REVIEW SYSTEMS	2
SCHEDULING	1	UPDATE SYSTEMS	1	VERIFY OUTPUT VALIDI	1	VERIFY WORK QUALITY	1
WRITE MANUALS	1						
COORDINATOR CONTROL	AVERAGE SALARY: $ 1000	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 0			
ASSIST MANAGEMENT	1	ASSIGN WORK	2	COORDINATE WORK FLOW	2	DESIGN FORMS	1
ESTABLISH PRIORITIES	1	EVALUATE EMPLOYEES	1	INVENTORY SUPPLIES	2	LIAISON	1
LOG WORK	1	ORDER SUPPLIES	2	TELEPHONING	1	TRACE MALFUNCTION	1
PROGRAMMER TECHNICIA	AVERAGE SALARY: $ 1000	STANDARD DEVIATION: $ 0		PROMOTE PERCENT: 100			
CHANGE PROGRAMS	1	CONSULT MANUFACTURER	2	COORDINATE SYSTEMS	1	CORRECT ERRORS	1
DEBUG PROGRAMS	1	DEBUG SYSTEMS	1	DEVELOP PROGRAMS	1	DOCUMENT PROGRAMS	1
FLOWCHART PROGRAMS	1	MAINTAIN SYSTEMS	1	MAINTAIN PROGRAMS	1	STUDY	2
TEST PROGRAMS	1	UPDATE SYSTEMS	1	WRITE PROGRAMS	1		

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

DESIGNER	AVERAGE SALARY: $ 1021	STANDARD DEVIATION: $ 88	PROMOTE PERCENT: 100				
ANSWER QUESTIONS	1	ASSIST PROGRAMMERS	1	CALCULATE	2	CONSULT PROGRAMMERS	1
CORRECT ERRORS	2	DEVELOP PROGRAMS	7	DOCUMENTATION	3	JOB ASSISTANCE	10
MONITORING	1	PREPARE INPUT DATA	6	REVIEW OUTPUT	1	REVIEW PROGRAMS	10
STORE FORMS OR CARDS	2	TRAIN EMPLOYEES	1	VERIFY PROGRAMS	1	VERIFY WORK QUALITY	1
VERIFY OUTPUT VALIDI	11	WRITE PROGRAMS	10	WRITE MANUALS	1		
MANAGER OFFICE	AVERAGE SALARY: $ 1025	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
CODE INPUT FORMS	5	MAIL, PROCESS	1	MAIL, SORT	1	SUPERVISE PERSONNEL	1
UPDATE OUTPUT	3						
OFFICER BUDGET CONTR	AVERAGE SALARY: $ 1073	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
COLLECT DATA	1	JOB ASSISTANCE	1	PREPARE REPORTS	2	PROCESS CORRESPONDEN	1
VERIFY OUTPUT VALIDI	1						
ANALYST SYSTEMS SR	AVERAGE SALARY: $ 1094	STANDARD DEVIATION: $ 154	PROMOTE PERCENT: 83				

TASK LIST OVERFLOW: SEE SUPPLEMENTARY REPORT.

PROGRAMMER SFTWRE AN	AVERAGE SALARY: $ 1100	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
ANALYZE PROBLEMS	1	ASSIST PROGRAMMERS	1	ATTEND MEETING	1	CONSULT USERS	2
CORRECT MALFUNCTION	5	DESIGN SYSTEMS	2	DEVELOP PROCEDURES	1	DISTRIBUTE REPORTS	1
DOCUMENT PROCEDURES	2	DOCUMENTATION	2	DOCUMENT PROGRAMS	2	EDUCATE SELF	2
ESTABLISH STANDARDS	1	EVALUATE SYSTEMS	1	FEASIBILITY STUDY	1	FLOWCHART	1
KEYPUNCH CARDS	1	TEST PROGRAMS	1	TRACE MALFUNCTION	1	UPDATE LIBRARY	1
VERIFICATION	1	WRITE PROGRAMS	1	WRITE MEMOS	1	WRITE INSTRUCTIONS	2
COORDINATOR PROGRAM	AVERAGE SALARY: $ 1100	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ASSIST USERS	2	ASSIST PROGRAMMERS	1	CHANGE PROGRAMS	1	LIAISON	1
REVIEW DOCUMENTATION	1	REVIEW WORK LOG	1	REVIEW SYSTEMS	1	SUPERVISING	1
WRITE PROGRAMS	2						
COORDINATOR	AVERAGE SALARY: $ 1157	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
BALANCE OUTPUT	2	CONSULTATION	1	DISTRIBUTE OUTPUT	1	LOG OUTPUT	1
PREPARE REPORTS	2	RECEIVE OUTPUT	1	STORE FORMS OR CARDS	1	SUPERVISE OPERATIONS	1
WRITE FORMS	1						
GROUP LEADER	AVERAGE SALARY: $ 1158	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ANALYZE OUTPUT	2	CORRECT ERRORS	1	FILE	1	PREPARE INPUT DATA	3
REVIEW PROGRAMS	1	SUPERVISE PERSONNEL	1	UPDATE INPUT DATA	1	VERIFY INPUT DATA	1
MANAGER DP	AVERAGE SALARY: $ 1190	STANDARD DEVIATION: $ 190	PROMOTE PERCENT: 39				
ANALYZE SYSTEMS	4	ANALYZING	2	APPROVE ORDERS	2	ATTEND MEETING	2
ATTEND SEMINAR	1	COLLECT DATA	1	CONSULT SUPERVISORS	1	CONSULT USERS	2
COORDINATE WORK FLOW	2	COORDINATE SYSTEMS	1	COORDINATING	2	DESIGN DATA FLOW	2
DESIGN SYSTEMS	6	DEVELOP SYSTEMS	1	EVALUATE SYSTEMS	1	JOB ASSISTANCE	1
LIAISON	2	MONITOR INVENTORY	1	MONITOR WORK FLOW	1	MONITOR SYSTEM	2
OPERATE COMPUTER	1	ORDER SUPPLIES	1	PLAN WORK FLOW	4	PLANNING	1
PREPARE REPORTS	1	PREPARE BUDGET	1	READ MANUALS	1	RECEIVE SALESMEN	2
REVIEW OPERATIONS	2	SELECT PERSONNEL	1	SOLVE PROBLEMS	1	STUDY SYSTEMS	1
SUPERVISE OPERATIONS	1	SUPERVISE PERSONNEL	6	SYSTEM PREPARATION	4	TRAVEL	2
WRITE MEMOS	1	WRITE PROGRAMS	1				

TABLE V (Continued)

JOBS ORDERED FROM LOWER TO HIGHER SALARIES WITH ASSOCIATED TASKS

ANALYST TECHNICIAN S	AVERAGE SALARY: $ 1217	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
CONDUCT MEETING	2	CONSULT MANAGEMENT	1	COORDINATE SYSTEMS	1	DELIVER FORMS	1
FILE REPORTS	1	ORAL PRESENTATIONS	1	PLANNING	2	PREPARE EMPLOYEE TRA	1
RECEIVE SALESMEN	1	RECOMMEND CHANGES	1	RELAY INFORMATION	3	REVIEW REPORTS	1
REVIEW SYSTEMS	1	SUPERVISE PERSONNEL	1	TRAIN EMPLOYEES	1	WRITE MEMOS	2
ANALYST RESEARCH DP	AVERAGE SALARY: $ 1250	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
COMMUNICATION, VERBA	1	DESIGN FORMS	1	DESIGN SYSTEMS	1	DOCUMENT SYSTEMS	1
IMPLEMENT SYSTEMS	1	MONITOR SYSTEM	1	STUDY	1	TRACE ERRORS	1
VERIFY OUTPUT VALIDI	1	WRITE LETTERS	1	WRITE REPORTS	1		
DIRECTOR	AVERAGE SALARY: $ 1250	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ANALYZE PROBLEMS	1	CONSULT USERS	1	DISCUSS PROBLEMS	1	EDUCATE SELF	1
ESTABLISH PRIORITIES	1	INTERVIEW APPLICANTS	4	PREPARE BUDGET	1	PROCESS CORRESPONDEN	1
REVIEW SYSTEMS	4	REVIEW REQUESTS	3	SUPERVISE PERSONNEL	4	TRACE MALFUNCTION	1
WRITE CORRESPONDENCE	1	WRITE MEMOS	4				
SUPERVISOR KP I	AVERAGE SALARY: $ 1301	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 0				
ANSWER QUESTIONS	1	ATTEND MEETING	1	CLERICAL WORK	1	CODE INPUT DATA	4
COMMUNICATION, VERBA	1	COORDINATE WORK FLOW	1	DELIVER FINISHED WOR	1	DUPLICATING	1
ESTABLISH PRIORITIES	1	EVALUATE EMPLOYEES	1	FILE FORMS OR CARDS	1	RECEIVE INSTRUCTIONS	1
RELAY INFORMATION	1	RELIEVE OPERATORS	1	SUPERVISE PERSONNEL	1	TELEPHONING	1
TRAIN OPERATORS	1	TYPE INSTRUCTIONS	1	UPDATE MANUALS	1	VERIFY INPUT DATA	1
MANAGER PROGRAMMING	AVERAGE SALARY: $ 1363	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ANSWER USER QUESTION	5	APPROVE PROGRAMS	6	ASSIGN WORK	1	ATTEND MEETING	2
CHANGE PROGRAMS	1	CODE INPUT DATA	1	COMMUNICATION, VERBA	2	DOCUMENTATION	1
LOG WORK	1	PLANNING	1	REVIEW PROGRAMS	5	REVIEW WORK LOG	1
TEST HARDWARE	1	TEST PROGRAMS	3	WRITE PROGRAMS	1		
MANAGER DATA SERVICE	AVERAGE SALARY: $ 1400	STANDARD DEVIATION: $ 0	PROMOTE PERCENT: 100				
ASSIGN WORK	1	DESIGN SYSTEMS	1	ESTABLISH PRIORITIES	2	SPECIAL ASSIGNMENTS	1
SUPERVISE PERSONNEL	1						

TABLE VI

JOB TITLES WITH MORE THAN 60 TASKS; FROM PROGRAM 3.

ANALYST SYSTEMS SR

ANALYZE SYSTEMS	1	ARRANGE TRAVEL	1	ASSIST ANALYSTS	1	ASSIST PROGRAMMERS	2
ASSIGN WORK	3	ATTEND CLASSES	1	ATTEND MEETING	5	CHANGE SYSTEMS	1
CONDUCT MEETING	1	CONSULT MANUFACTURER	1	CONSULT ANALYSTS	1	CONSULT SUPERVISORS	1
CONSULTATION	5	CONSULT USERS	2	COORDINATE SYSTEMS	1	COORDINATE WORK FLOW	1
COORDINATING	1	DEBUG PROGRAMS	1	DELIVER FORMS	2	DESIGN JOB CONTROL	1
DESIGN FORMS	1	DESIGN INPUT FORMS	1	DESIGN SYSTEMS	11	DEVELOP PROCEDURES	1
DISCUSS PROBLEMS	1	DOCUMENT SYSTEMS	4	EDUCATE USERS	1	EDUCATE SELF	2
ENFORCE POLICIES	1	EVALUATE SYSTEMS	1	EVALUATING	2	EVALUATE EMPLOYEES	2
IMPLEMENT SYSTEMS	11	INTERVIEW APPLICANTS	1	MAINTAIN SYSTEMS	1	MONITOR WORK FLOW	3
MONITORING	1	MONITOR SYSTEM	4	ORAL PRESENTATIONS	2	ORDER EQUIPMENT	2
ORIENT EMPLOYEES	1	PREPARE USER GUIDE	4	READ MANUALS	2	RECOMMEND PROMOTIONS	1
RECOMMEND CHANGES	2	REVIEW MANUALS	1	REVIEW OUTPUT	1	REVIEW DOCUMENTATION	1
REVIEW REPORTS	1	REVIEW PROGRAMS	1	REVISE MANUALS	1	REVIEW WORK LOG	1
REVIEW SYSTEMS	3	REVIEW OPERATIONS	1	SCHEDULE COMPUTER TI	1	SCHEDULE MAINTENANCE	1
STUDY	1	SUPERVISE PERSONNEL	3	TEST PROGRAMS	4	TRAVEL	2
TROUBLESHOOTING	2	UPDATE PROCEDURES	2	UPDATE SYSTEMS	2	VERIFICATION	1
VERIFY WORK QUALITY	2	WRITE FORMS	1	WRITE REPORTS	1	WRITE MANUALS	2
WRITE MEMOS	2	WRITE LETTERS	2				

COORDINATOR DP

ANALYZING	1	ANALYZE SYSTEMS	1	ANSWER QUESTIONS	1	ASSIST USERS	1
ASSIGN WORK	2	ATTEND MEETING	7	BALANCE REPORTS	1	CALCULATE	1
CHANGE PROGRAMS	1	COMMUNICATION, VERBA	3	COMPUTER JOBS	1	CONSULT USERS	1
CONSULTATION	2	CONSULT MANAGEMENT	6	COORDINATE OPERATION	1	COORDINATE WORK FLOW	6
CORRECT ERRORS	1	DESIGN DATA FLOW	1	DESIGN FORMS	1	DESIGN SYSTEMS	1
DESIGN FILES	1	DESIGN CARD LAYOUTS	2	DEVELOP EMPLOYEE TRA	1	DISTRIBUTE OUTPUT	1
DOCUMENTATION	1	ESTABLISH STANDARDS	4	EVALUATING	1	EVALUATE EMPLOYEES	4
FEASIBILITY STUDY	3	FILE FORMS OR CARDS	1	IMPLEMENT SYSTEMS	2	JOB ASSISTANCE	1
LIAISON	9	MAINTAIN SYSTEMS	2	MONITORING	1	MONITOR SYSTEM	1
MONITOR WORK FLOW	1	OPERATE OFFICE EQUIP	1	ORAL PRESENTATIONS	1	ORDER SUPPLIES	1
ORIENT EMPLOYEES	1	PLANNING	1	PREPARE REPORTS	7	PROCESS CORRESPONDEN	2
RELIEVE OPERATORS	1	REVIEW WORK LOG	1	SELECT PERSONNEL	1	SORT CARDS	1
SPECIAL ASSIGNMENTS	2	SUPERVISE PERSONNEL	1	SUPERVISING	1	SYSTEM PREPARATION	1
TAPE, DISTRIBUTE	1	TAPE, PREPARE LABELS	1	TELEPHONING	3	TRACE ERRORS	2
TRAIN EMPLOYEES	3	TROUBLESHOOTING	1	WRITE MEMOS	1	WRITE PROGRAMS, SPEC	1
WRITE INSTRUCTIONS	1	WRITE PROGRAMS	1				

TABLE VI (Continued)

JOB TITLES WITH MORE THAN 60 TASKS; FROM PROGRAM 3.

COORDINATOR HOSPITAL							
ANALYZING	1	ASSIST USERS	1	ASSIGN WORK	1	ATTEND SEMINAR	1
ATTEND MEETING	18	CALCULATE PAYROLL	1	CONDUCT MEETING	1	CONSULT USERS	2
CONSULT OPERATORS	1	CONSULT SUPERVISORS	1	CONSULT MANUFACTURER	1	CONSULTATION	8
CONSULT MANAGEMENT	2	COORDINATE OPERATION	2	COORDINATING	2	COORDINATE SYSTEMS	28
CORRECT ERRORS	3	COUNSEL EMPLOYEES	3	DESIGN DATA FLOW	1	DESIGN FORMS	4
DEVELOP EMPLOYEE TRA	1	DISCUSS PROBLEMS	3	DISTRIBUTE OUTPUT	2	DOCUMENT SYSTEMS	1
EDIT REPORTS	1	EDIT INPUT DATA	2	ESTABLISH POLICIES	1	EVALUATE SYSTEMS	1
EVALUATE EMPLOYEES	3	FILE	1	IMPLEMENT SYSTEMS	7	INTERPRET CARDS	1
JOB ASSISTANCE	1	LIAISON	10	LOG	1	MAIL, SORT	1
MAIL, PROCESS	1	MAINTAIN SECURITY	1	MONITOR SYSTEM	1	MONITOR INVENTORY	1
OPERATE TERMINAL	5	ORAL PRESENTATIONS	3	ORDER SUPPLIES	6	ORDER EQUIPMENT	4
ORIENT EMPLOYEES	4	PREPARE INPUT DATA	1	PREPARE REPORTS	2	READ	1
READ MEMOS	1	RECEIVE OUTPUT	5	RELAY INFORMATION	20	REPRODUCE CARDS	1
REVIEW WORK LOG	4	REVIEW REQUESTS	1	SEPARATE OUTPUT	2	SOLVE PROBLEMS	7
SORT CARDS	1	SPECIAL ASSIGNMENTS	7	STORE FORMS OR CARDS	1	SUPERVISE PERSONNEL	2
SUPERVISING	2	SUPERVISE OPERATIONS	3	TELEPHONING	4	TRAIN EMPLOYEES	4
UPDATE MANUALS	1	UPDATE DOCUMENTATION	1	UPDATE SYSTEMS	7	VERIFY DATA	1
VERIFY OUTPUT VALIDI	2	WRITE PROGRAMS	2	WRITE USER GUIDE	1	WRITE REPORTS	1
WRITE JOB DESCRIPTIO	4	WRITE PROGRAMS, SPEC	7	WRITE LETTERS	1	WRITE MEMOS	4

TABLE VI (Continued)

JOB TITLES WITH MORE THAN 60 TASKS; FROM PROGRAM 3.

OPERATOR COMPUTER							
ANSWER USER QUESTION	1	APPROVE ORDERS	1	ASSIST USERS	1	ASSIGN WORK	2
ASSIST OPERATORS	1	BALANCE OUTPUT	1	BALANCE REPORTS	7	BALANCE INPUT DATA	2
BUILD BACK UP	3	BURST FORMS	15	CALCULATE PAYROLL	1	CHANGE RIBBON	1
CLEAR PAPER JAMS	10	CLEAR CARD JAMS	30	CODE INPUT DATA	1	COLLATE CARDS	7
COLLATE FORMS	1	COLLECT DATA	4	COMPUTER JOBS	247	CONDUCT TOURS	1
CONSULT USERS	3	CONSULTATION	4	COORDINATING	4	COORDINATE SYSTEMS	4
COORDINATE WORK FLOW	25	CORRECT MALFUNCTION	1	CORRECT JOB CONTROL	21	CORRECT PROGRAMS	1
CORRECT ERRORS	6	CORRECT INPUT DATA	1	COUNSEL EMPLOYEES	1	DECOLLATE OUTPUT	4
DELIVER FINISHED WOR	1	DELIVER FORMS	1	DISK, MOUNT	75	DISK, SET UP DRIVES	50
DISK, BUILD BACK UP	1	DISK, COPY	1	DISTRIBUTE OUTPUT	3	DISTRIBUTE REPORTS	2
DOCUMENT SYSTEMS	1	EDIT OUTPUT	1	EDIT REPORTS	1	EDIT INPUT DATA	6
ENCODE DATA	1	ENFORCE POLICIES	1	FILE DISKS	5	FILE TAPES	23
FILE PRINTER LOOPS	1	HOUSEKEEPING	11	IMPLEMENT SYSTEMS	2	INSTRUCT EMPLOYEES	1
INTERPRET CARDS	10	INVENTORY SUPPLIES	1	JOB ASSISTANCE	5	KEYPUNCH PROGRAMS	1
KEYPUNCH CARDS	30	KEYPUNCH JOBS	9	KEYPUNCH JOB CONTROL	6	LABELING	6
LIAISON	1	LOAD OUTPUT DEVICES	11	LOAD INPUT DEVICES	11	LOG TAPES	5
LOG ATTENDANCE	1	LOG	1	LOG WORK	12	LOG MALFUNCTIONS	2
LOG COMPUTER TIME	1	MAINTAIN FILES	2	MAINTAIN SYSTEMS	5	MAINTAIN PROGRAMS	1
MAINTAIN EQUIPMENT	10	MICROFILMING	1	MONITOR INPUT	30	MONITOR TERMINALS	1
MONITOR EQUIPMENT	5	MONITOR WORK FLOW	6	MONITOR SYSTEM	25	MONITOR COMPUTER	20
MONITOR INVENTORY	7	MOUNT PLOTTAPE	4	MOVE CARDS OR FORMS	1	OPERATE PLOTTER	35
OPERATE CARD EQUIPME	2	OPERATE COMPUTER	6	OPERATE SYSTEM	1	ORDER SUPPLIES	1
PLAN MEETINGS	1	PREPARE REPORTS	6	PRINTER, MOUNT CHAIN	1	PRINTER, CUT LOOPS	4
PRINTER, CHANGE RIBB	14	PRINTER, LOAD FORMS	41	READ MEMOS	15	RECEIVE CARDS	1
RECEIVE JOB REQUESTS	1	RECOMMEND PROMOTIONS	1	RELAY INFORMATION	2	RELIEVE EMPLOYEE	1
RELIEVE OPERATORS	2	REPLENISH SUPPLIES	8	REPRODUCE CARDS	22	REVIEWING	1
REVIEW MANUALS	1	REVIEW DOCUMENTATION	1	REVIEW WORK LOG	1	SALVAGE UNUSED STOCK	2
SCHEDULE MAINTENANCE	2	SCHEDULE COMPUTER TI	1	SEPARATE OUTPUT	19	SORT INPUT DATA	4
SORT FORMS	7	SORT CARDS	15	SPECIAL ASSIGNMENTS	8	STORE FORMS OR CARDS	4
SUPERVISE OPERATIONS	1	SUPERVISING	3	SUPERVISE PERSONNEL	3	SYSTEM PREPARATION	20
TAB, LIST CARDS	21	TAKE TURN OVER	1	TAPE, DISTRIBUTE	1	TAPE, MOUNT	107
TAPE, LOG USAGE	1	TAPE, MAINTAIN	2	TAPE, FILE	1	TAPE, BLOCK	1
TAPE, CLEAN DRIVES	9	TAPE, PREPARE LABELS	31	TAPE, BUILD BACK UP	3	TELEPHONING	102
TEST PROGRAMS	22	TRAIN EMPLOYEES	1	TRAIN OPERATORS	3	TROUBLESHOOTING	4
UPDATE LOG	1	UPDATE LIBRARY	2	UPDATE MANUALS	2	UPDATE JOB CONTROL	1
UPDATE FILES	2	VERIFY OUTPUT VALDIT	2	VERIFY DATA	1	VERIFY OUTPUT VALIDI	3
WIRE CONTROL PANELS	4	WRITE MANUALS	1	WRITE NOTES	2	WRITE MEMOS	10
WRITE PROGRAMS	4						

TABLE VI (Continued)

JOB TITLES WITH MORE THAN 60 TASKS; FROM PROGRAM 3.

OPERATOR KP I							
ATTEND MEETING	1	BATCH FORMS	1	CHANGE RIBBON	2	CLERICAL WORK	5
CODE INPUT DATA	7	CODE INPUT FORMS	1	COLLATE FORMS	1	CONSULTATION	1
CORRECT ERRORS	2	DECOLLATE OUTPUT	2	DELIVER INPUT DATA	1	DELIVER FINISHED WOR	1
DELIVER COMPUTER JOB	1	DESIGN CARD LAYOUTS	2	DISTRIBUTE REPORTS	1	DISTRIBUTE OUTPUT	5
DOCUMENT SYSTEMS	1	EDIT INPUT DATA	16	EDIT FORMS	1	EVALUATING	1
FILE SOURCE DOCUMENT	10	FILE FORMS OR CARDS	5	FLOWCHART	1	HOUSEKEEPING	1
INTERPRET CARDS	11	KEYPUNCH JOB CONTROL	1	KEYPUNCH PROGRAMS	4	KEYPUNCH JOBS	172
LABELING	1	LOG TERMINAL USAGE	1	LOG WORK	2	MAIL, PREPARE	1
MAIL OUTPUT	1	MAIL, SORT	11	MAIL, DATE	10	MAIL, PICK UP	11
MAINTAIN FILES	1	MONITOR INVENTORY	1	MOVE CARDS OR FORMS	1	OPERATE OFFICE EQUIP	3
OPERATE PRINTER	1	OPERATE TERMINAL	29	ORDER SUPPLIES	1	PROCESS INPUT DATA	21
PROOFREAD	1	REPLENISH SUPPLIES	2	REPRODUCE CARDS	2	SCHEDULE MAINTENANCE	3
SEPARATE OUTPUT	4	SORT CARDS	1	SORT FORMS	1	STORE FORMS OR CARDS	2
TELEPHONING	22	TRACE ERRORS	1	UPDATE INPUT DATA	6	UPDATE FILES	3
UPDATE LOG	1	UPDATE REPORTS	1	UPDATE JOB CONTROL	2	UPDATE MANUALS	1
VERIFY CARDS	6	VERIFY DATA	1	VERIFY KEYPUNCHED JO	2	WRITE MEMOS	5
WRITE FORMS	15	WRITE PROGRAMS, SPEC	4	XERDXING	1		
OPERATOR KP II							
ANSWER QUESTIONS	31	ASSIST SUPERVISORS	2	ASSIGN WORK	6	ATTEND MEETING	2
BALANCE REPORTS	1	BALANCE INPUT DATA	1	BATCH FORMS	2	BUILD BACK UP	1
CALCULATE PAYROLL	1	CHANGE RIBBON	1	CLERICAL WORK	2	CODE INPUT DATA	7
CODE INPUT FORMS	3	COLLATE CARDS	1	CONSULTATION	1	CONSULT OPERATORS	1
CONSULT SUPERVISORS	4	COORDINATE WORK FLOW	4	CORRECT ERRORS	7	DECOLLATE OUTPUT	1
DELIVER INPUT DATA	1	DELIVER FINISHED WOR	1	DELIVER FORMS	1	DELIVER COMPUTER JOB	1
DESIGN SYSTEMS	1	DESIGN CARD LAYOUTS	2	DESIGN DRUM CARD	3	DISTRIBUTE WORK	2
DISTRIBUTE OUTPUT	8	EDIT INPUT DATA	14	ENFORCE POLICIES	2	EVALUATING	1
EVALUATE EMPLOYEES	3	FILE OUTPUT	1	FILE FORMS OR CARDS	4	FILE	1
FOLLOW INSTRUCTIONS	1	INSTRUCT EMPLOYEES	5	INVENTORY SUPPLIES	1	JOB ASSISTANCE	5
KEYPUNCH JOB CONTROL	2	KEYPUNCH PROGRAMS	1	KEYPUNCH DRUM CARD	3	KEYPUNCH JOBS	99
LIAISON	2	LOG ATTENDANCE	1	LOG TERMINAL USAGE	1	LOG	2
LOG WORK	4	LOG BATCHES	1	MAIL, SORT	1	MAIL, PREPARE	2
MAIL OUTPUT	2	MAINTAIN FILES	1	MAINTAIN MANUALS	2	MONITOR EQUIPMENT	2
MONITOR WORK FLOW	2	MONITOR SYSTEM	1	OPERATE PRINTER	2	OPERATE TERMINAL	25
ORDER SUPPLIES	3	PLAN WORK SCHEDULE	1	PREPARE REPORTS	6	PRINTER, CHANGE RIBB	2
PROCESS CORRESPONDEN	3	PROCESS INPUT DATA	21	PROOFREAD	1	REFER TO FILES	2
RELIEVE SUPERVISOR	4	REVIEW REPORTS	1	REVIEW WORK LOG	1	REVIEW PROCEDURES	3
SEPARATE OUTPUT	4	SORT CARDS	22	SPECIAL ASSIGNMENTS	3	STAMP FORMS	2
STORE FORMS OR CARDS	3	SUPERVISE PERSONNEL	1	TELEPHONING	36	TRACE ERRORS	16
TRAIN EMPLOYEES	2	TRAIN OPERATORS	3	TROUBLESHOOTING	1	TYPE REPORTS	1
TYPE	1	UPDATE DOCUMENTATION	1	UPDATE MANUALS	4	UPDATE FILES	1
UPDATE INPUT DATA	7	UPDATE JOB CONTROL	3	VERIFY CARDS	37	VERIFY INPUT DATA	8
VERIFY OUTPUT VALIDI	17	VERIFICATION	1	VERIFY KEYPUNCHED JO	34	WRITE FORMS	5
WRITE MEMOS	8	WRITE PROGRAMS, SPEC	6	XEROXING	3		

TABLE VI (Continued)

JOB TITLES WITH MORE THAN 60 TASKS; FROM PROGRAM 3.

PROGRAMMER							
ANALYZE SYSTEMS	1	ANALYZING	3	ANSWER USER QUESTION	1	APPROVE PROGRAMS	1
ASSIST USERS	1	ASSIST PROGRAMMERS	3	ASSIST OPERATORS	2	ATTEND MEETING	3
ATTEND SEMINAR	1	BUILD BACK UP	2	BURST FORMS	1	CHANGE PROGRAMS	5
CHANGE SYSTEMS	1	COMMUNICATION, VERBA	2	COMPUTER JOBS	9	CONSULT PROGRAMMERS	1
CONSULT USERS	2	CONSULT MANAGEMENT	1	CONSULTATION	1	COORDINATING	1
COORDINATE SYSTEMS	1	CORRECT ERRORS	3	CORRECT PROGRAMS	11	DEBUG PROGRAMS	8
DESIGN OUTPUT FORMAT	4	DESIGN INPUT FORMATS	1	DESIGN FILES	2	DESIGN SYSTEMS	3
DESIGN FORMS	2	DEVELOP PROGRAMS	2	DEVELOP PROCEDURES	2	DISK, MAINTAIN	2
DISK, COPY	1	DOCUMENTATION	1	DOCUMENT SYSTEMS	2	DOCUMENT PROGRAMS	7
EDUCATE SELF	2	FLOWCHART SYSTEM	1	FLOWCHART	1	FLOWCHART PROGRAMS	7
FOLLOW INSTRUCTIONS	2	INSTRUCT OPERATORS	1	INTERPRET CARDS	1	JOB ASSISTANCE	2
KEYPUNCH JOB CARDS	1	KEYPUNCH JOB CONTROL	2	KEYPUNCH PROGRAMS	2	KEYPUNCH CARDS	2
LOG COMPUTER TIME	1	MAINTAIN SYSTEMS	2	MAINTAIN PROGRAMS	4	MONITORING	1
MONITOR SYSTEM	2	OPERATE COMPUTER	1	ORDER SUPPLIES	1	PREPARE REPORTS	1
READ MANUALS	3	READ	1	RECOMMEND CHANGES	1	REFER TO FILES	1
REVIEW DOCUMENTATION	1	REVIEW PROGRAMS	3	SCHEDULE COMPUTER TI	1	SPECIAL ASSIGNMENTS	2
STUDY	1	TAPE, MAINTAIN	2	TAPE, PRINT	1	TEACH CLASS	2
TEST PROGRAMS	16	UPDATE REPORTS	2	VERIFY WORK QUALITY	1	VERIFICATION	1
VERIFY CARDS	1	VERIFY INPUT DATA	1	VERIFY OUTPUT VALIDI	3	WRITE MANUALS	2
WRITE PROGRAMS, SPEC	1	WRITE INSTRUCTIONS	2	WRITE LETTERS	1	WRITE PROGRAMS	23
PROGRAMMER ANALYST							
ANALYZING	2	ANALYZE PROGRAMS	1	ANALYZE SYSTEMS	6	ASSIGN USER ACCOUNTS	1
ASSIGN WORK	2	ASSIST ANALYSTS	3	ASSIST PROGRAMMERS	6	ASSIST SUPERVISORS	1
ASSIST USERS	3	ATTEND MEETING	1	CHANGE PROGRAMS	10	CHANGE SYSTEMS	2
COLLECT DATA	1	CONSULT PROGRAMMERS	1	CONSULT MANUFACTURER	2	CONSULT ANALYSTS	2
CONSULT USERS	7	DEBUG SYSTEMS	1	DEBUG PROGRAMS	7	DEMONSTRATE COMPUTER	1
DESIGN FORMS	3	DESIGN SYSTEMS	3	DEVELOP EMPLOYEE TRA	1	DISK TO TAPE CONVERS	1
DISK, MAP	1	DOCUMENT PROGRAMS	3	DOCUMENT SYSTEMS	3	DOCUMENT PROCEDURES	1
EDUCATE SELF	2	EVALUATE SYSTEMS	3	FEASIBILITY STUDY	1	FLOWCHART	1
FLOWCHART PROGRAMS	2	IMPLEMENT SYSTEMS	6	INSTRUCT PROGRAMMER	3	INSTRUCT OPERATORS	6
INSTRUCT USERS	2	KEYPUNCH CARDS	11	LOG COMPUTER TIME	1	MAINTAIN LIBRARY	2
MAINTAIN SYSTEMS	6	MAINTAIN PROGRAMS	1	MONITOR SYSTEM	3	ORAL PRESENTATIONS	1
PLAN SYSTEMS	5	PREPARE REPORTS	1	SPECIAL ASSIGNMENTS	4	STUDY SYSTEMS	8
SYSTEM PREPARATION	30	TAPE, BUILD BACK UP	2	TEACH CLASS	3	TELEPHONING	1
TEST SYSTEMS	1	TEST PROGRAMS	4	UPDATE SYSTEMS	1	UPDATE LOG	2
UPDATE LIBRARY	2	UPDATE FILES	1	UPDATE MANUALS	1	UPDATE JOB CONTROL	1
WRITE PROGRAMS, SPEC	4	WRITE JOB CONTROL	2	WRITE REPORTS	1	WRITE MANUALS	1
WRITE INSTRUCTIONS	2	WRITE LETTERS	1	WRITE MEMOS	1	WRITE PROGRAMS	6

TABLE VI (Continued)

JOB TITLES WITH MORE THAN 60 TASKS; FROM PROGRAM 3.

SUPERVISOR OPERATION

ANALYZING	1	ANSWER QUESTIONS	1	APPROVE DOCUMENTATIO	1	ASSIST USERS	7
ASSIST PROGRAMMERS	1	ASSIST OPERATORS	1	ASSIST SUPERVISORS	1	ASSIGN WORK	7
ATTEND MEETING	1	BALANCE REPORTS	1	BURST FORMS	2	CHANGE PROGRAMS	1
CLEAR PAPER JAMS	10	CLEAR CARD JAMS	10	COMPUTER JOBS	17	CONDUCT TOURS	1
CONSULT MANAGEMENT	5	CONSULT SUPERVISORS	1	COORDINATE MAINTENAN	3	COORDINATE WORK FLOW	6
COORDINATING	2	COUNSEL EMPLOYEES	2	DECOLLATE OUTPUT	5	DEVELOP PROCEDURES	1
DISK, PREPARE LABELS	1	DISTRIBUTE SUPPLIES	1	DOCUMENT PROCEDURES	1	ENCODE TAPE	1
ENFORCE POLICIES	2	EVALUATE SYSTEMS	1	EVALUATING	2	EVALUATE EMPLOYEES	3
FILE REPORTS	1	FILE TAPES	1	HOUSEKEEPING	2	IMPLEMENT SYSTEMS	1
INSTRUCT EMPLOYEES	1	INSTRUCT OPERATORS	2	INTERVIEW APPLICANTS	1	INVENTORY SUPPLIES	2
JOB ASSISTANCE	3	KEYPUNCH CARDS	2	LABELING	20	LIAISON	2
LOG MALFUNCTIONS	1	LOG WORK	4	LOG	1	LOG COMPUTER TIME	2
MAINTAIN EQUIPMENT	2	MAINTAIN SYSTEMS	2	MICR PROCESSING	1	MONITOR WORK FLOW	1
MONITOR EQUIPMENT	12	MONITORING	2	MONITOR INVENTORY	3	OPERATE COMPUTER	1
OPERATE CARD EQUIPME	1	ORDER SUPPLIES	3	PLAN WORK SCHEDULE	1	PREPARE REPORTS	2
PRINTER, CHANGE RIBB	10	PRINTER, CUT LOOPS	1	RECEIVE SALESMEN	1	RECOMMEND CHANGES	2
RELAY INFURMATION	1	RELIEVE OPERATORS	3	REVIEW MANUALS	1	REVIEWING	3
REVIEW WORK LOG	2	SCHEDULE MAINTENANCE	2	SCHEDULE COMPUTER TI	5	SCHEDULING	3
SELECT PERSONNEL	2	SEPARATE OUTPUT	1	SORT CARDS	2	SPECIAL ASSIGNMENTS	7
STORE FORMS OR CARDS	1	SUPERVISING	1	SUPERVISE PERSONNEL	3	SUPERVISE OPERATIONS	1
SYSTEM PREPARATION	1	TAPE, PREPARE LABELS	1	TAPE, CLEAN DRIVES	1	TAPE, BUILD BACK UP	1
TAPE, TEST	1	TELEPROCESSING	1	TELEPHONING	4	TRAIN OPERATORS	3
TRANSFER DATA	1	UPDATE PROGRAMS	1	UPDATE LIBRARY	1	UPDATE PROCEDURES	1
VERIFY INPUT DATA	1	VERIFY OUTPUT VALIDI	2	WIRE CONTROL PANELS	3	WRITE PROGRAMS	1
WRITE MEMOS	1	WRITE NOTES	1	WRITE REPORTS	1		

Purpose Number Four

To identify both the current and the projected usage status of computer equipment, input/output media, and programming languages used by the employers of this study's respondents.

Information was collected from 45 businesses about 14 equipment components, 8 types of input/output media, and 7 programming languages. The manufacturing origin of this group of installations was very similar to the distribution described by Awad (1971). (See Population and Sample, Chapter III.) IBM systems dominated the group with 84.4%; others were Univac, 2.2%; Honeywell, 4.5%; NCR, 4.5%; and others, 4.4%.

Each equipment component has presented under its name, in Table VII, 28 data items arranged in four columns. The column contents are identified in the accompanying legends. Line items are identified by side headings. Reading the "Sum" line, for instance, 261 keypunches were in use at the time of the study; 47 will be discarded by 1975; 59 were added since 1968; and 25 will be added by 1975.

Reading a portion of the same data vertically, 22 of the keypunches which are to be discarded by 1975 (column 2) were located outside Kansas City (Loc 1); 25 were in Kansas City; 47 keypunches were to be discarded and 44 of these were bring discarded by a large business (Size 5).

Considering columns 2 and 4 for each component, it seems that sorters, interpreters, reproducers, collators, and tabulators are being phased out. If the rates indicated remain stable, the sorters will stay in use about 9 years and the tabulators 4 years; but the interpreters, reproducers, and collators will be out of use in about three years.

INSTALLATION DESCRIPTION AND EQUIPMENT-PHASING DATA

		DATA RECORDER				KEYPUNCH				VERIFIER				SORTER				INTERPRETER				REPRODUCER				COLLATER			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
LOC	1	7	0	1	6	181	22	49	20	66	15	14	5	24	4	3	0	14	2	1	0	11	3	2	0	11	5	2	0
LOC	2	8	0	8	18	80	25	10	5	38	12	4	2	14	0	3	0	10	12	1	0	9	4	0	0	7	2	0	0
SIZE	2	7	0	1	1	26	2	4	0	4	1	0	1	9	0	1	0	4	0	0	0	5	1	1	0	5	2	1	0
SIZE	3	2	0	2	2	38	1	9	10	4	1	1	0	4	0	2	0	3	0	1	0	0	0	0	0	0	0	0	0
SIZE	4	0	0	0	0	37	0	20	6	8	0	5	1	3	1	0	0	2	0	0	0	3	1	0	0	1	1	0	0
SIZE	5	6	0	6	21	160	44	26	9	88	25	12	5	22	3	3	0	23	14	1	0	12	5	1	0	12	4	1	0
SUM	5	15	0	9	24	261	47	59	25	104	27	18	7	38	4	6	0	32	14	2	0	20	7	2	0	18	7	2	0

LEGEND:

1 UNITS IN USE
2 DISCARDING BY 75
3 NEW SINCE 1968
4 TO ADD BY 1975

Column Legend (in groups of 4)

		TABULATOR				TERMINAL				SCANNER				ENCODER				DISPLAY UNIT				AUDIO UNIT				MTST TYPEWRITER			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
LOC	1	4	1	0	0	170	0	99	154	2	0	2	0	5	0	5	0	51	0	16	57	1	0	1	0	57	0	55	2
LOC	2	5	1	0	0	42	0	41	97	6	1	1	2	0	0	0	8	54	0	54	176	0	0	0	0	0	0	0	0
SIZE	2	1	0	0	0	20	0	16	54	0	0	0	0	5	0	5	0	0	0	0	7	0	0	0	0	3	0	2	2
SIZE	3	0	0	0	0	105	0	45	32	0	0	0	0	0	0	0	0	45	0	12	7	0	0	0	0	0	0	0	0
SIZE	4	2	1	0	0	30	0	30	10	1	0	1	0	0	0	0	0	2	0	0	0	1	0	1	0	2	0	2	0
SIZE	5	6	1	0	0	57	0	49	155	7	1	2	2	0	0	0	0	58	0	58	219	0	0	0	0	52	0	51	0
SUM	5	9	2	0	0	212	0	140	251	8	1	3	2	5	0	5	0	105	0	70	233	1	0	1	0	57	0	55	2

LEGEND:

1 UNITS IN USE
2 DISCARDING BY 75
3 NEW SINCE 1968
4 TO ADD BY 1975

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LOC	1	15	4	1	30	2	6	18	3	16	12	9	11	8	2	12
LOC	2	7	0	0	10	0	2	9	1	8	3	2	7	4	5	1
SIZE	2	5	2	0	9	2	1	6	2	4	3	2	3	3	2	5
SIZE	3	4	0	0	4	0	0	5	2	3	2	2	3	3	2	1
SIZE	4	3	1	1	4	0	2	3	0	4	3	3	1	0	0	3
SIZE	5	10	1	0	23	0	5	13	0	13	7	4	11	6	3	4
SUM	5	22	4	1	40	2	8	27	4	24	15	11	18	12	7	13

LEGEND:

1	MAGNETIC TAPE	6	MARK SENSE	11	PL/1
2	PAPER TAPE	7	DISK	12	BAL
3	MAGNETIC CARD	8	OTHER MEDIA	13	RPG I
4	PUNCHED CARD	9	COBOL	14	RPG II
5	MAGNETIC INK	10	FORTRAN	15	OTHER LANGUAGE

Row Legend:
Loc 1 = outside Kansas City
Loc 2 = Kansas City

Size 2 = 4-24 employees
Size 3 = 25-99 employees
Size 4 = 100-500 employees
Size 5 = over 500 employees

Figure 11. Layout and Legend for Table VII

TABLE VII

MEDIA, LANGUAGE, AND EQUIPMENT DATA

INSTALLATION DESCRIPTION AND EQUIPMENT-PHASING DATA

	DATA RECORDER				KEYPUNCH				VERIFIER				SORTER				INTERPRETER				REPRODUCER				COLLATER			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
LOC 1	7	0	1	6	181	22	49	20	66	15	14	5	24	4	3	0	14	2	1	0	11	3	2	0	11	5	2	0
LOC 2	8	0	8	18	80	25	10	5	38	12	4	2	14	0	3	0	18	12	1	0	9	4	0	0	7	2	0	0
SIZE 2	7	0	1	1	26	2	4	0	4	1	0	1	9	0	1	0	4	0	0	0	5	1	1	0	5	2	1	0
SIZE 3	2	0	2	2	38	1	9	10	4	1	1	0	4	0	2	0	3	0	1	0	0	0	0	0	0	0	0	0
SIZE 4	0	0	0	0	37	0	20	6	8	0	5	1	3	1	0	0	2	0	0	0	3	1	0	0	1	1	0	0
SIZE 5	6	0	6	21	160	44	26	9	88	25	12	5	22	3	3	0	23	14	1	0	12	5	1	0	12	4	1	0
SUM 5	15	0	9	24	261	47	59	25	104	27	18	7	38	4	6	0	32	14	2	0	20	7	2	0	18	7	2	0

LEGEND:

1 UNITS IN USE
2 DISCARDING BY 75
3 NEW SINCE 1968
4 TO ADD BY 1975

	TABULATOR				TERMINAL				SCANNER				ENCODER				DISPLAY UNIT				AUDIO UNIT				MTST TYPEWRITER			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
LOC 1	4	1	0	0	170	0	99	154	2	0	2	0	5	0	5	0	51	0	16	57	1	0	1	0	57	0	55	2
LOC 2	5	1	0	0	42	0	41	97	6	1	1	2	0	0	0	0	54	0	54	176	0	0	0	0	0	0	0	0
SIZE 2	1	0	0	0	20	0	16	54	0	0	0	0	5	0	5	0	0	0	0	7	0	0	0	0	3	0	2	2
SIZE 3	0	0	0	0	105	0	45	32	0	0	0	0	0	0	0	0	45	0	12	7	0	0	0	0	0	0	0	0
SIZE 4	2	1	0	0	30	0	30	10	1	0	1	0	0	0	0	0	2	0	0	8	1	0	1	0	2	0	2	0
SIZE 5	6	1	0	0	57	0	49	155	7	1	2	2	0	0	0	0	58	0	58	219	0	0	0	0	52	0	51	0
SUM 5	9	2	0	0	212	0	140	251	8	1	3	2	5	0	5	0	105	0	70	233	1	0	1	0	57	0	55	2

LEGEND:

1 UNITS IN USE
2 DISCARDING BY 75
3 NEW SINCE 1968
4 TO ADD BY 1975

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LOC 1	15	4	1	30	2	6	18	3	16	12	9	11	8	2	12
LOC 2	7	0	0	10	0	2	9	1	8	3	2	7	4	5	1
SIZE 2	5	2	0	9	2	1	6	2	4	3	2	3	3	2	5
SIZE 3	4	0	0	4	0	0	5	2	3	2	2	3	3	2	1
SIZE 4	3	1	1	4	0	2	3	0	4	3	3	1	0	0	3
SIZE 5	10	1	0	23	0	5	13	0	13	7	4	11	6	3	4
SUM 5	22	4	1	40	2	8	27	4	24	15	11	18	12	7	13

LEGEND:

1 MAGNETIC TAPE
2 PAPER TAPE
3 MAGNETIC CARD
4 PUNCHED CARD
5 MAGNETIC INK
6 MARK SENSE
7 DISK
8 OTHER MEDIA
9 COBOL
10 FORTRAN
11 PL/1
12 BAL
13 RPG I
14 RPG II
15 OTHER LANGUAGE

Loc 1 = outside Kansas City
Loc 2 = Kansas City

Size 2 = 4-24 employees
Size 3 = 25-99 employees
Size 4 = 100-500 employees
Size 5 = over 500 employees

The keypunches and verifiers are showing mixed trends but a 5% net decrease in verifiers and a 1% net increase in keypunches are indicated by the data. Figures for data recorders were combined with the keypunch figures. A data recorder is the keypunch counterpart in an IBM System/3 computer installation or it is the new IBM Model 129 keypunch which has just been marketed. No respondent indicated a Mohawk Data Services key-to-tape recorder under this category.

Optical scanners, encoders, and audio units were almost too rare to indicate a trend. The MTST (magnetic tape selectric typewriter), which was included at the suggestion of the "jury" (see Instrumentation, Chapter III) was thought to be increasing in the area. The data in Table VII indicates relative stability.

Since a display unit is a type of terminal (cathode ray tube -- CRT), its data may well be considered along with that listed under "Terminal." The most change seems to center in this area of direct-access devices, i.e., terminals. About 66% of the 317 in use were added since 1968 and that number is expected to reach 801 by 1975 -- a 121% increase.

Perhaps the most significant implications of these considerations are (1) that a "phasing" is currently underway in the installations studied; and (2) that the "keying" components are still very much in use. It could also be inferred from the terminal trend that computer services are developing a new dimension -- outreach.

Information presented regarding media and languages may be read in much the same manner from the side heads. Vertically, however, there is a lone column of data for each media and language indicated in the legend of numbers 1 - 15. The columns contain totals representing the

number of users by location and by business size with the grand total as the Sum.

Obviously, punched card, magnetic disk, and magnetic tape are the most used media with COBOL leading the languages. BAL, FORTRAN, RPG I, and PL/1 were rather evenly distributed in use. The "Other" language category combined lesser used languages such as Autocoder, NEAT, ASSIST, BASIC.

A less obvious fact emerges with the realization that Sums 1 through 8 total more than 45 as do Sums 9 - 15. This indicates that some of the businesses surveyed were using multiple languages as well as more than one media.

Projected changes in media and languages were in the "to be added by 1975" direction. This data is not presented in Table VII, because it was processed manually. These items seem relatively stable. Four businesses were going to add disk; two were adding COBOL; and one each were going to add FORTRAN, RPG I, RPG II, and PL/1. All of the disk changes and four of the language changes were outside Kansas City. Three of the disk changes were in the smallest businesses reporting (Size 2) as were one COBOL and the RPG I change. All of the other changes were in Size 5 installations.

Chapter Summary

This study identified by occupational title personnel engaged in automated data-control employment. It also identified tasks performed by these data-control personnel. The titles and related tasks were combined into a hierarchy based upon the mean pay of each occupational title. That the illustrated and other similar types of data extraction

are possible seems to indicate that the information as presented has potential for educational decisions -- limited only by the perception and the energy of the user. Development of this type of broadly applicable information was the general purpose of this study.

A trend toward direct-access devices, i.e., terminals and display units was noted as was the stability of the media and language usage, in general, through the projection period, 1975.

A series of numeric data (usually means) were tabulated to describe such items as performance frequencies, task importances, hiring difficulty of the identified occupations, minimum recommended education, on-the-job training costs, and employees' perceptions of their jobs.

All data presented was developed by using seven computer programs. It was presented in seven tables. Suggestions for interpreting the data and for cross-referencing the material were demonstrated.

Some degree of commonality was found among the occupational titles; even more commonality was present in the body of related tasks. The current and projected usage status of computer equipment, media, and languages was identified. Phasing out of certain punched-card (unit-record) equipment was indicated but this did not include the keypunch or punched-card media.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The general purpose of this study was to gather regionally applicable information useful as guidelines for planning, implementing, and/or for updating educational data-processing programs.

Specifically, it was an occupational analysis designed to:

(1) identify both the occupational titles of persons engaged in automated data-control and the tasks performed by them;

(2) present the relationships of the occupations and tasks in hierarchial format;

(3) reflect the usage status of selected computer-related components.

Four-hundred selected employees in 45 west central Missouri businesses contributed data for the analysis. The businesses, ranging in size from 5 to over 500 employees, represented nine SIC codes. All were using computer services at the time of the study. These users were suggested by local computer manufacturers. An aggregate work force of approximately 1,400 employees was represented by the selected respondents.

Expanded versions of occupational-analysis forms used in similar previous research provided this study's instrumentation. Most of the form distribution and retrieval was done through personal contact. In four cases, it was initiated by personal contact and completed by mail.

Responses were coded and keypunched yielding 400 job-title cards, 2,100 task-title cards (punched two per card), and 88 installation-description cards. The data was processed with seven computer programs.

Briefly, the results indicated 178 different occupational titles and 458 different tasks performed in these occupations. The job titles appeared less common than the tasks and showed a tendency to be unique within SIC code classifications. The title deck was 55% redundant while the task deck contained 91% redundancy. This would seem to indicate that by concentrating on 45% (i.e., 178) of the original job titles the entire range of identified occupations would be covered. Similar logic would seem to point to building curriculum around 8% (i.e., 360) of the original task titles -- thus educating for the entire spectrum of data-processing employees as identified in this study.

At least eight clusters of occupational titles (Analysts, Clerks, Secretaries, Coordinators, Managers and Directors, Operators, Programmers, and Supervisors) were identified. Numerous task clusters were also visible in the data analysis.

In combination, the data presents descriptions of what data-processing employees are called along with what they do and where on the pay scale the occupations may be found -- according to mean salary.

Concomitant results indicated that 130 of the 178 occupations carried a minimum-education recommendation of less than junior college. Employers reported 145 of the occupations as difficult to very difficult to fill.

Average on-the-job training costs reported by employers of 144 of the occupations were $1,000 or more with 18 of these exceeding $9,999 - the maximum size allowed for the data. No training-cost data was

reported for 41 occupations, so only 34 were in the less than $1,000 category. Education could have lowered this cost on 102 of the occupations, said the employers.

Component data indicated over a 100% increase in direct-access devices (terminals and display units) by 1975 and 1% in keypunching equipment. Other unit-record (punched-card) equipment appeared to be phasing out with the sorter and the verifier having the slowest removal rates. The noticeable move to terminals and display units was in the Size 3 and Size 5 businesses with Kansas City respondents indicating a 326% increase in display units and a 220% increase in terminals.

Installations were using more than one media and more than one language. Both of these items appeared relatively stable to 1975. Ten percent of the businesses were going to add disk media; 5% were adding COBOL programming. Four other 2% language changes were indicated. All of the changes noted were outside Kansas City in Size 2 and Size 5 businesses.

Conclusions

The following conclusions were drawn from the results of this study:

(1) Data-control tasks did exist in identifiable areas other than in programming, systems analysis, keypunching, and unit-record operating. At least five other groups of workers were identified including some bearing office-occupations titles as suggested by Perkins (1966).

(2) The job titles did not necessarily reveal the actual nature of the work performed by the employee as pointed

out in the case of the Clerk Typist II who operated a terminal, card sorter, printer, et al. This, too, was supported by the Dade County Junior College Study by Koschler (1965).

(3) Clusters of data-processing tasks are identifiable and variation in occupational title does not necessarily mean variation in the work performed. Earlier research has said the same thing relative to other occupations (Perkins, 1968; LaSalle, 1964; U.S.O.Ed., 1964; Newman, 1965). That this study says the cluster concept is applicable to data-processing occupations is evident from the task reduction of 91%. The job titles may be relatively unique but the work is not nearly as unique.

(4) A growing emphasis is being placed on modern data-transmission methods but the keypunch will be used through 1975. Clark (1967) also predicted this.

(5) High school level data-processing programs could be used as springboards either into the labor market or into higher level programs.

(6) This study has provided information that should be useful in planning for educational data-processing programs in west central Missouri, particularly in two areas: curriculum development and equipment implementation.

Recommendations

Based upon the results of the study and the conclusions made, it is recommended that:

(1) The occupational hierarchy and companion tables be used as a frame of reference for planning local data-processing programs at educational levels paralleling the occupational distribution indicated.

(2) The local office education courses be phased toward data-processing occupations.

(3) If employers are "phasing" so should the vocational education institutions. Installations donating obsolete equipment should attach a permanent notice saying "Employers probably will not be using these machines by the time you reach the labor market!".

(4) To phase "with" the indicators means that repeated regional research is necessary to keep information current; more specifically occupational analyses.

(5) An Occupational Analyst should be required on every vocational institution staff. Thus, the occupations for which the school offers training may be surveyed regularly with the feedback being used to maintain relevant educational objectives and procedures.

(6) The data presented is regional and should be interpreted only as such. Similar studies in other regions with other SIC code compositions could disprove or strengthen and complement these findings.

(7) If this study were replicated, a check-list task-instrument (always open-ended) should be considered. This would permit a more accurate replication of the same task coding used here. This recommendation is made with the assumption

> that the check-list instrument presumes that the researcher already has relatively complete, accurately stated items to present to the respondent -- such a presumption was not made in this study.

Ideally, high schools and probably area vocational schools could concentrate on the occupations in the distribution's lower segment; 13th and 14th year institutions on the central section's occupations. If the same general guidelines were used by each institution, the transition from one educational level to another would become efficient.

Additionally, a guidance value exists if this hierarchy were used with Table I. It is conceivable that a student at any level could be told (a) the cluster(s) of occupations requiring the abilities which he had or was interested in acquiring; (b) what the probable job titles were according to the particular SIC code in which an employment application might be made; (c) an approximation of salary and (d) some hint as to the type of career that could be expected.

Component-wise, media-wise, language-wise, it is relatively clear what local users intend to change. Educational decision-makers should phase with the indicators, not after the indicators. Indications now would be for students to be offered opportunities to learn multi-media multi-language approaches to these occupations with hands-on experience in the operatives.

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APPENDIX A

DATA-COLLECTION INSTRUMENTS

DCP-1

RETURN TO: Missouri State Department of Education
P. O. Box 480
Vocational Division; Business & Office Ed.
Attention Jane Bucks; Data-Control Project
Jefferson City, Missouri 65101

Company_____
Address_____
Contact_____ Telephone_____

Industry_____ SIC Code_____
Respondent's Job Title_____
Respondent's Name if not same as Contact:
Name_____

_____Check here if you desire a copy of the findings.

Appointment: Date_____
Time_____

Interview Number_____
Interviewer_____

CALL BACK

Date	Time	Explanation

COMPONENTS OF PROCESSING AND/OR TRANSMITTING SYSTEM	Number of units in use	Units to be discontinued in next 5 years	Units added since 1968	Anticipated additions within next 5 years--expand list as needed	Tape, Card, Inquiry, Transmission Type: (for example)	Manufacturer and Model Number or
Data Recorder						
Key Punch						
Verifier						
Sorter						
Interpreter						
Reproducer						
Collator						
Tabulator (Acct'g. Mach.)						
Console						
Terminal						
Reader, Card						
Reader (specify type)						
Punch (" ")						
Printer						
Optical Scanner						
Magnetic Encoder						
Display Unit						
Audio Response						
Word Processing: MTST						
CPU						
Other						
Other						
Other						

✓ Those in use

✓✓ To be added by 1975

MEDIA
Magnetic tape_____
Paper tape_____
Magnetic cards_____
Punched cards_____
Magnetic ink_____
Mark sense_____
Disk_____
Other:
_____
_____

WATFOR compiler_____
Other_____

COBOL_____
FORTRAN IV_____
FORTRAN other_____
PL/I_____
BAL_____
RPG I_____
RPG II_____
OTHER_____
OTHER_____

DCP-2 Page _____of_____.

TASK LISTING SHEET

Job Title_____

No.	Task	Performance Frequency	Importance

Importance Code: 1=vital to job; 2=necessary to job; 3=extra assignments
Performance Frequency: Examples=once a week; 1 to 10 times daily; continuously, twice monthly

DCP-2 ***SAMPLE COMPLETION*** Page 1 of 3 .

TASK LISTING SHEET

Note: Words 'Edit' and 'Process' should probably be more specifically defined.

Job Title Computer Data Handler

No.	Task	Performance Frequency	Importance
1	Update & process work I.D.	Weekly	1
2	Keypunch job cards	Daily	1
3	Prepare tape labels	Daily	2
4	Update & process project listing	Weekly	1
5	Edit & process full-time, part-time, and overtime payroll	Monthly	1
6	Update & process all insurance runs (hosp., life, permit, etc.)	Bi-weekly	1
7	Wire, operate & maintain IBM PCAM equipment	Daily	1
8	Maintain storage of paper & cards	Weekly	3
9	Separate Output	Continuously	1
10	Put packets with jobs	20 times daily	1
11	Interpret cards	5-15 times daily	2
12	Operate burster	when needed	3
13	Read requistions	Continuously	1
14	File tapes	5-10 times daily	2
15	Make back-up tapes	1-5 times daily	2
16	Write inter-office communications (forms & memos)	1-10 times daily	2

Importance Code: 1=vital to job; 2=necessary to job; 3=extra assignments
Performance Frequency: Examples=once a week; 1 to 10 times daily; continuously, twice monthly

DCP-3 3a_____ Page_____of_____.
3b_____
3c_____
3d_____
3e_____

EMPLOYEE LOG SHEET

Job Title_____ Approx. Salary_____
Job Title of next higher position to which you could be promoted_____

Please log (list) yesterday's job activities, whether or not you feel that they represent a typical day's activities:

Possible detractions from maximum-job performance: NONE_____; or: (describe as necessary)
Noise_____; Crowding_____; Interruptions_____;
Extra tasks_____; Other_____.

SUPERVISOR'S SUMMARY

Company_____

Computer System:_____ Operating Level:_____

Approximate Number of Employees in Company:

1-3	4-24	25-99	100-500	over 500

Approximate number of persons to be added for data control classifications in the next three years; specify job title, if possible:

_____

_____

_____

Approximate number of persons in data control classifications:_____

Re: Project Studying Data-Control Practices in Missouri and Implications for Business-Information Occupational Training

Reference: Missouri State Department of Education; Vocational Division
Jane Bucks, Data-Control Project; 314-635-8125, Ext. ~~132~~ 126

Supervisor's Participation:

1. Complete one set of forms for own occupational title.

2. Distribute green forms to sampling of employees in typical data-processing job categories as well as to other employees directly related (including part-time) to the planning, processing, and/or transmitting system(s).

   Distribution and re-collection mechanics are subject to the supervisor's judgment; however, please request employees' completion of all sections of the forms and that TASKS should be detailed enough to reveal the skills necessary to performance.**

3. On the first employee Log Sheet for each job classification, please indicate:
   a. Minimum education recommended for the classification:
      1=H.S.; 2=Jr. College; 3=Degree; 4=Other (please specify)
   b. Hiring difficulty for the classification:
      1=very difficult; 2=difficult; 3=no problem
   c. Size of the sample represented; i.e. approximate number of employees having the same job title
   d. _____Estimated cost (in $ or time) of getting a new employee of the type being surveyed to an acceptable production level.
   e. Do you feel that this cost could have been reduced through previous education?_____

**NOTE: The central purpose of the study is to discover necessary components for employee-training programs in Missouri.

ARTHUR L. MALLORY
[redacted]
COMMISSIONER

Area Code 314
Phone 635-8125

STATE DEPARTMENT OF EDUCATION
DIVISION OF PUBLIC SCHOOLS
JEFFERSON BUILDING
P. O. BOX 480
JEFFERSON CITY, MISSOURI 65101

Are you interested in helping your company gain access to a better trained labor supply for data-processing and/or related office-information occupations?

An August, 1971 survey of Metropolitan St. Louis large employers has established both the feasibility of and the need for developing appropriate curriculum for data-control practices throughout the State.

A second project is now underway to analyze the necessary components for employee-training programs in Missouri. You can assist with this project by responding to the enclosed requests and by letting a representative sample of your data-system employees indicate their job titles and the actual tasks that they perform.

Any assistance you provide will be treated confidentially and will not in any way be identified with the name of your company in the final report.

So that your suggestions may be included in the analysis, please complete and return the enclosed materials in the provided envelope on or before September 10, 1971.

Thank you for your contribution.

Sincerely yours,

Jane Bucks; Data-Control Project
Vocational Division; Business & Off. Ed.

Enclosures

APPENDIX B

CARD FORMATS

IBM

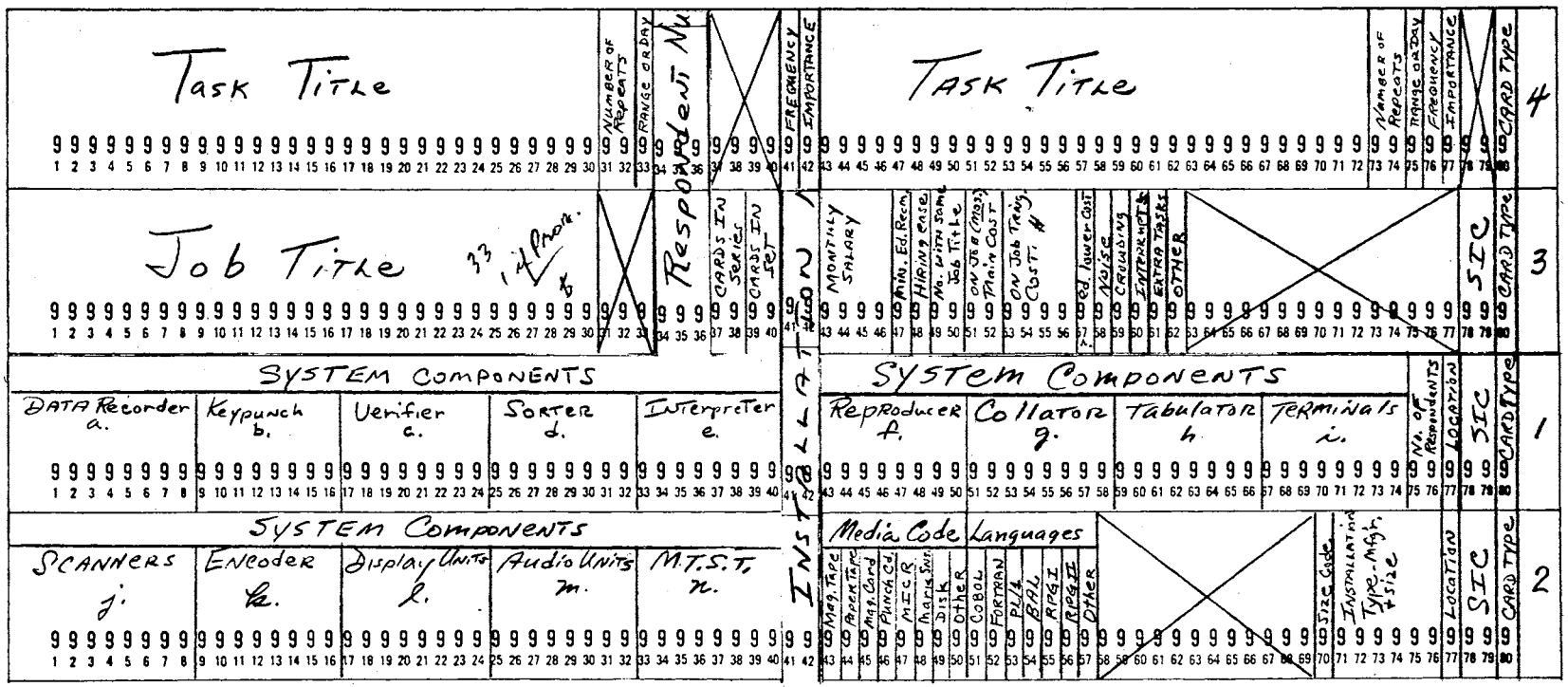
INTERNATIONAL BUSINESS MACHINES CORPORATION

GX24-6599-0
Printed in U.S.A.

MULTIPLE-CARD LAYOUT FORM

Company Data-Control Occupations

Application Respondent Card-Sat by Jane Bucks Date 1-21-72/2-2-72 Job No. _____ Sheet No. 1 of 1



APPENDIX C

COMPUTER PROGRAMS

PROGRAM TWO
(Page 1)

```
FORTRAN IV G LEVEL  19                  MAIN              DATE = 72118        20/48/09              PAGE 0001

0001              DIMENSION D(180,32),MASK(30) ,A(10),TITLE(49),INT(20),INFO(4,180),
                 1MD(180,30)
0002              DATA B/'A'/,BL/' '/
0003              DO 1 I=1,3
0004              DO 1 J=1,180
0005            1 INFO (I,J) = 0
0006              DO 2 I=1,180
0007              DO 2 J=10,32
0008            2 D(I,J)=0.
0009              II=1
0010              ICARD=0
0011              READ(5,4) TITLE
0012            4 FORMAT (16A4/20A4/13A4)
                C READ IN AND LIST DATA IN LOOP 30.
0013              DO 30 MM=1,2000
0014            5 READ(5,7,END=32) MASK,PR,NN,A,KODE,NTYPE
0015            7 FORMAT(30A1,  2X,F1.0,5X,I2,2X,F4.0,2F1.0,F2.0,2X,F4.0,5F1.0,
                 116X,I2,I1)
0016              IF(A(2).EQ.0.) A(2)=1.
0017              DO 6 I=1,20
0018              IF (MASK (I).LT.0) GO TO 6
0019              MASK (I) = MASK (I) * (-2)
0020              IF (MASK (I+ 1).LT.0) GO TO 6
0021              MASK (I + 1) = MASK (I + 1) * (-2)
0022              MASK (I + 2) = MASK (I + 2) * (-2)
0023              GO TO 11
0024            6 CONTINUE
0025           11 ICARD= ICARD+NN
0026              IF(NTYPE.EQ.3) GO TO 9
0027              WRITE(6,8) II,(MASK(I),I=1,30) ,ICARD
0028            8 FORMAT(I5,4X,30A1,  4X,' CARD NO.',I5,' ERROR IN DECK.')
0029              STOP
0030            9 I1=II
0031              DO 12 I=1,I1
0032              IF(I.EQ.I1) GO TO 13
0033              DO 10 J=1,30
0034              IF(MASK(J).NE.MD(I,J)) GO TO 12
0035           10 CONTINUE
0036              CALL MARK(D,A,KODE,I,PR)
0037              GO TO 20
0038           12 CONTINUE
0039           13 II=II+1
0040           16 DO 18 J=1,30
0041           18 MD(I1,J) = MASK(J)
0042              CALL MARK(D,A,KODE,I1,PR)
0043           20 N=NN-1
0044              DO 21 I=1,N
0045           21 READ(5,22) MOVE
0046           22 FORMAT(A4)
0047           30 CONTINUE
                C CONVERT TO MEANS AND PERCENTS IN LOOP 38.
0048           32 II=II-1
0049              DO 38 I=1,II
0050              D(I,11)=D(I,11)/D(I,10)
0051              D(I,32)=  (D(I,32)/D(I,10)-D(I,11)**2)**.5
0052              D(I,31)=(D(I,31)/D(I,10))*100.
0053              DO 36 J=21,29
0054              IF(J.EQ.23) GO TO 36
```

PROGRAM TWO
(Page 2)

```
FORTRAN IV G LEVEL  19                  MAIN              DATE = 72118          20/48/09              PAGE 0002

0055                D(I,J)= D(I,J)/D(I,10)
0056             36 CONTINUE
0057                DO 37 J=26,29
0058                D(I,30)=D(I,30)+D(I,J)/4.
0059             37 D(I,J)=D(I,J)*100.
C060             38 CONTINUE
0061                DO 75 MM=1,2
0062                DO 39 I=1,II
0063             39 D(I,9)=1.
0064                I4=II-1
0065                IF(MM.EQ.2) GO TO 50
C066                DO 44 I=1,I4
0067                I2=I+1
0068                DO 44 J=I2,II
0069                DO 42 K=1,20
0070                IF (MD(I,K)- MD(J,K))  40, 42, 41
C071             40 D(J,9)=D(J,9)+1.
0072                GO TO 44
0073             41 D(I,9)=D(I,9)+1.
C074                GO TO 44
0075             42 CONTINUE
0076             44 CONTINUE
C077                DO 45 I = 1,II
0078                DO 45 J = 5,22
0079             45 IF (MD(I,J).GT.8) MD (I,J) = BL
C080            111 WRITE (6,100)
0081            100 FORMAT (2X,//1H ,'D MATRIX DUMP'//)
0082                WRITE (6,78) ((MD(LL,L),L=1,24),(D(LL,L),L=9,28),LL=1,II)
0083             78 FORMAT(1X,24A1,20F5.0)
0084                DO 46 I=1,II
C085                K=D(I,9)
0086             46 INFO(MM,K)=I
0087                GO TO 60
0088             50 DO 54 I=1,I4
0089                I2=I+1
0090                DO 54 J=I2,II
C091                IF(D(I,11)-D(J,11)) 51,51,52
0092             51 D(J,9)=D(J,9)+1.
0093                GO TO 54
0094             52 D(I,9)=D(I,9)+1.
0095             54 CONTINUE
C096                DO 56 I=1,II
0097                K=D(I,9)
0098                INFO(3,K)=D(I,11)
C099                INFO(1,K)=D(I,31)
0100                INFO(4,K)=D(I,32)
0101             56 INFO(MM,K)=I
0102             60 DO 75 I=1,II,50
0103                I2=MINO(I+49,II)
0104                WRITE(6,70) TITLE
0105             70 FORMAT('1', T37, 16A4// 33A4/)
0106                DO 72 JJ=I,I2
0107                J=INFO(MM,JJ)
0108                DO 71 M=10,20
0109             71 INT(M)=D(J,M)
0110                NEMP = D(J,23)
0111                NED =D(J,24)
0112             72 WRITE (6,74) JJ,(MD(J,N),N=1,28),(INT(N),N=10,20),
```

PROGRAM TWO
(Page 3)

```
FORTRAN IV G LEVEL  19                  MAIN              DATE = 72118        20/48/09          PAGE 0003

     1D(J,21),D(J,22),NEMP,NED,(D(J,N),N=25,30)
0113      74 FORMAT (1H ,I4,2X,28A1, 2I5,2X,9I3,2X,2F5.1,I4,I6,F5.1,2X,5F6.1)
0114      75 CONTINUE
0115         DO 80 I1=1,II,18
0116         I2=MIN0(II,I1+17)
0117         ICARD = 1 + I1/18
0118         WRITE (7,77) (INFO(1,J),J=I1,I2),II,ICARD
0119      77 FORMAT (    18I4,3HPRO, I3,I2)
0120         WRITE (7,88) (INFO(2,J),J=I1,I2),II,ICARD
0121      88 FORMAT (18I4,3HPAY,I3,I2)
0122         WRITE(7,79) (INFO(3,J),J=I1,I2),II,ICARD
0123      79 FORMAT (18I4,3H8UX,I3,I2)
0124         WRITE (7,81)(INFO(4,J),J=I1,I2),II,ICARD
0125      81 FORMAT(18I4,3HSDV,I3,I2)
0126      80 CONTINUE
0127         STOP
0128         END

FORTRAN IV G LEVEL  19                  MARK              DATE = 72118        20/48/09          PAGE 0001

C001         SUBROUTINE MARK (D,A,KODE,I,PR)
0002         DIMENSION D(180,32),A(10)
0003         D(I,11)=D(I,11)+A(1)
C004         D(I,31)=D(I,31)+PR
0005         D(I,32)=D(I,32)+A(1)**2
0006         D(I,10)=D(I,10)+1.
C007         KK=KODE+4/KODE+8
0008         D(I,KK)=D(I,KK)+1.
0009         DO 10 J=21,29
0010      10 D(I,J)=D(I,J)+A(J-19)
0011         RETURN
0012         END
```

PROGRAM THREE

(Page 1)


```
      DIMENSION D(2000,15),T(22),CLASS(4),LIMIT(8),TITLE(20)
      DATA CLASS/'DZZZ','LZZZ','RZZZ','    '/
      DO 1 I=1,2000
      DO 1 J=1,15
    1 D(I,J)=0.
      NCARD=0
      READ(5,2) TITLE
    2 FORMAT(20A4)
      DO 3 I=1,2000,500
      J=1+I/500
      LIMIT(J)=I
    3 LIMIT(J+4)=I
    4 READ(5,5,END=22) T,KTYPE
    5 FORMAT(7A4,2X,F2.0,F1.0,7X,2F1.0,7A4,2X,F2.0,3F1.0,2X,I1)
      IF(KTYPE.EQ.3)  GO TO 4
      NCARD = NCARD + 1
      DO 26 M=1,12,11
      IF(T(M).EQ.CLASS(4)) GO TO 4
      MJ=M-1
      N1=1
      DO 12 I=1,3
      IF(T(M).GT.CLASS(I)) GO TO 13
   12 N1=N1+500
   13 L=5+N1/500
      N2=LIMIT(L)
      IF(N2.GT.LIMIT(L-4)+499) GO TO 18
      DO 16 I=N1,N2
      IF(I.EQ.N2) GO TO 17
      M4=M+3
      DO 14 K=M,M4
      KK=K-M+1
      IF(T(K).NE.D(I,KK)) GO TO 16
   14 CONTINUE
      D(I,8)=D(I,8)+T(8+MJ)
      KOL=T(9+MJ)
      D(I,11+KOL)=D(I,11+KOL)+1.
      IF(KOL.EQ.2) GO TO 26
      IF(T(10+MJ).EQ.7.)T(10+MJ)=4.
      D(I,9)=D(I,9)+T(10+MJ)
      D(I,10)=D(I,10)+T(11+MJ)
      GO TO 26
   16 CONTINUE
   17 KOL=T(9+MJ)
      DO 15 NN=1,7
   15 D(N2,NN)=T(NN+MJ)
      D(N2,11+KOL)=1.
      D(N2,8)=D(N2,8)+T(8+MJ)
      IF(T(10+MJ).EQ.7.)T(10+MJ)=4.
      D(N2,9) = D(N2,9) + T(10+MJ)
      D(N2,10)=D(N2,10)+T(11+MJ)
   18 LIMIT(L)=LIMIT(L)+1
      IF(LIMIT(L).LE.LIMIT(L-4)+499) GO TO 26
      WRITE(6,19) L,(LIMIT(K),K=5,8)
   19 FORMAT(' LIST',I5,'  EXCEEDS 500.',4I6)
   26 CONTINUE
      GO TO 4
   22 LINE=3
      LAG=1
```

PROGRAM THREE
(Page 2)


```
0059            DO 51 II=5,8
0060         51 LIMIT(II)=LIMIT(II)-1
0061            DO 54 N1=1,1501,500
0062            N2=LIMIT(5+N1/500)
0063            DO 52 J=N1,N2
0064         52 D(J,14)=LAG
0065         54 LAG=LAG+LIMIT(5+N1/500)-N1+1
0066            DO 59 N1=1,1501,500
0067            N4=LIMIT(5+N1/500)
0068            N3=N4-1
0069            DO 59 I=N1,N3
0070            N2=I+1
0071            DO 59 J=N2,N4
0072            DO  56 MM=1,4
0073            IF((D(I,MM).GT.0.).OR.(D(J,MM).GT.0.)) GO TO 55
0074            IF(D(I,MM)-D(J,MM)) 57,56,58
0075         55 IF(D(I,MM)-D(J,MM)) 58,56,57
0076         56 CONTINUE
0077         58 D(J,14)=D(J,14)+1.
0078            GO TO 59
0079         57 D(I,14)=D(I,14)+1.
0080         59 CONTINUE
0081            WRITE(6,30) TITLE
0082         30 FORMAT('1'/20A4/)
0083            L=0
0084            N=LIMIT(5)
0085            N1=LIMIT(2)
0086            N2=LIMIT(8)
0087            DO 28 K=N1,N2
0088            IF(D(K,1).EQ.0.) GO TO 28
0089            N=N+1
0090            DO 27 NN=1,14
0091         27 D(N,NN)=D(K,NN)
0092         28 CONTINUE
0093            DO 31 I=1,N
0094            K=D(I,14)
0095            D(K,15)=I
0096            F=D(I,11)+D(I,12)
0097            IF (F.LT.1.) F=1.
0098            DO 31 J=9,10
0099         31 D(I,J)=D(I,J)/F
0100            DO 40 II=1,N
0101            I= D(II,15)
0102            L=L+1
0103            J1=D(I,8)+D(I,11)+D(I,13)+1.
0104            J2=D(I,11)
0105            J3=D(I,12)
0106            J4=D(I,13)
0107            IF(MOD(L,2).EQ.0) GO TO 38
0108            IF(LINE.LT.58) GO TO 34
0109            WRITE(6,30) TITLE
0110            LINE=3
0111         34 LINE=LINE+1
0112            WRITE(6,37) L,(D(I,J),J=1,7),J1,D(I,9),D(I,10),J2,J3,J4
0113         37 FORMAT(I6,2X,7A4,I5,2F5.1,3I4)
0114            GO TO 40
0115         38 WRITE(6,39) L,(D(I,J),J=1,7),J1,D(I,9),D(I,10),J2,J3,J4
0116         39 FORMAT('+',T70,I4,2X,7A4,I5,2F5.1,3I4)
```

FORTRAN IV G LEVEL 19

```
0117            40 CONTINUE
0118               STOP
0119               END
```

PROGRAM FOUR
(Page 1)

```
FORTRAN IV G LEVEL  19                MAIN              DATE = 72118          20/55/32              PAGE 0001

            C DATA DECK REQUIRES PAY SEQUENCE AND PAY CARDS ALTERNATING.
0001              DIMENSION TITLE(20),ID(60,1074),IR(5),IT(12),INFO(5,180)
0002                DO 2 I=1,180
0003              2 INFO(5,I)=60
0004                READ(5,5) TITLE
0005              5 FORMAT(20A4)
0006                DATA NIL/'ZZZZ'/
0007              , DO 8 I=1,180,18
0008                I2=I+17
0009                READ(5,6) ((INFO(L,J),J=I,I2),1PAY,II,L=1,4)
0010              6 FORMAT ( 18I4,A3,I3/18I4,A3,I3/18I4,A3,I3/18I4,A3,I3)
0011              8 CONTINUE
0012              9 LAT=1
0013                NCARD=0
0014             10 READ(5,12,END=60) IR,NN,KODE
0015             12 FORMAT(5A4,18X,I2,39X,I1)
0016                NCARD=NCARD+NN
0017                IF(KODE.EQ.3) GO TO 14
0018                WRITE(6,13) NCARD,IR
0019             13 FORMAT(' DECK INCORRECT. CARD:',I5,2X,4A4)
0020                STOP
0021             14 DO 40 M1=1,LAT,6
0022                M5=M1+4
0023                M6=M1+5
0024                IF(M1.EQ.LAT) GO TO 45
0025                DO 15 I=1,5
0026                K=M1+I-1
0027                IF(IR(I).NE.ID(1,K)) GO TO 40
0028             15 CONTINUE
            C  LOOP 35 MATCHES TASKS TO LIST, AND TOTALS OR ADDS IF NO MATCH.
0029                DO 35 N=2,NN
0030                READ(5,17) IT
0031             17 FORMAT(5A4,10X,I2,10X,5A4,10X,I2)
0032                DO 30 L1=1,7,6
0033                IF(IT(L1).GT.NIL) GO TO 10
0034                L2=L1+4
0035                L6=L1+5
0036                NT=IT(L6)+1/(IT(L6)+1)
0037                I2=ID(1,M6)
0038                DO 22 I=2,I2
0039                DO 21 M=M1,M5
0040                JJ=M-M1+L1
0041                IF(IT(JJ).NE.ID(I,M)) GO TO 22
0042             21 CONTINUE
0043                ID(I,M6)=ID(I,M6)+NT
0044                GO TO 30
0045             22 CONTINUE
0046             24 IF(ID(1,M6).LT.60) GO TO 26
0047                INFO(5,1+M1/6)=INFO(5,1+M1/6)+1
0048                GO TO 30
0049             26 I2=I2+1
0050                DO 29 M=M1,M5
0051                JJ=M-M1+L1
0052             29 ID(I2,M)=IT(JJ)
0053                ID(I2,M6)=NT
0054                ID(1,M6)=ID(1,M6)+1
0055             30 CONTINUE
0056             35 CONTINUE
```

PROGRAM FOUR
(Page 2)

```
FORTRAN IV G LEVEL  19                MAIN              DATE = 72118          20/55/32              PAGE 0002

            GO TO 10
         40 CONTINUE
      C THROUGH  LOOP 52 A NEW JOB AND ITS TASK LIST IS ENTERED.
         45 DO 46 M=M1,M5
            JJ=M-M1+1
         46 ID(1,M)=IR(JJ)
            NZ=1
            DO 51 LL=2,NN
            READ(5,17) IT
            DO 50 L1=1,7,6
            IF(IT(L1).GT.NIL)  GO TO 52
            DO 48 NQ=2,NZ
            DO 47 M=M1,M5
            JJ=M-M1+L1
            IF(IT(JJ).NE.ID(NQ,M))GO TO 48
         47 CONTINUE
            ID(NQ,M6)=ID(NQ,M6)+1
            GO TO 51
         48 CONTINUE
         49 NZ=NZ+1
            IT(L1+5)=IT(L1+5)+1/(IT(L1+5)+1)
            DO 50 M=M1,M6
            JJ=M-M1+L1
         50 ID(NZ,M)=IT(JJ)
         51 CONTINUE
         52 ID(1,M6)=NZ
            LAT=LAT+6
            IF(LAT.LT.1080) GO TO 10
         60 WRITE (6,61)(J,J=1,40),(INFO(5,J),J=1,II)
         61 FORMAT(/' OFLOW >60 ',40I3)
            LINE=60
            DO 80 I=1,II
            LOW=INFO(2,I)
            M6=LOW*6
            M1=M6-5
            M5=M6-1
            NN=ID(1,M6)
            N=NN-1
            DO 64 L=2,N
            L2=L+1
            DO 64 L4=L2,NN
            IF(ID(L,M1).LT.ID(L4,M1)) GO TO 64
            DO 62 J=M1,M6
            KEEP=ID(L,J)
            ID(L,J)=ID(L4,J)
         62 ID(L4,J)=KEEP
         64 CONTINUE
            LN=(NN+3)/4+1
            IF(LINE+LN.LT.58) GO TO 68
            LINE=4
            WRITE(6,66) TITLE
         66 FORMAT('1'/20A4/)
         68 WRITE(6,69) (ID(1,M),M=M1,M5),INFO(3,I),INFO(4,I),INFO(1,I)
         69 FORMAT(/2X,5A4,2X,' AVERAGE SALARY: $',I5,'    STANDARD DEVIATION:
          1$',I5,'   PROMOTE PERCENT: ',I4)
            IF(INFO(5,LOW).LT.61) GO TO 71
            WRITE(6,70)
         70 FORMAT(/' TASK LIST OVERFLOW;  SEE SUPPLEMENTARY REPORT.'//)
```

```
FORTRAN IV G LEVEL  19                MAIN              DATE =

            GO TO 80
         71 LINE=LINE+(NN+3)/4+2
            WRITE(6,72) ((ID(J,M),M=M1,M6),J=2,NN)
         72 FORMAT(4(4X,5A4,2X,I5))
         80 CONTINUE
            STOP
            END
```

PROGRAM FIVE
(Page 1)

```
FORTRAN IV G LEVEL  19                 MAIN                DATE = 72118          21/06/37              PAGE 0001

      C   PROGRAM LISTS OVERFLOW TASKS FROM PROGRAM 3  DOES NOT NEED INFO DECK.
          DIMENSION TITLE(20),ID(220,54), IR(5),IT(12),JB(45)
          READ(5,5) TITLE
        5 FORMAT(20A4)
          DATA NIL/'ZZZZ'/
          READ(5,6) JB
        6 FORMAT (20A4)
          DO 7 I1=1,49,6
          I5=I1+4
          J1=I1-I1/6
          ID(1,I1+5)=1
          DO 7 I=I1,I5
          J=I-I1+J1
        7 ID(1,I)=JB(J)
          NCARD=0
       10 READ(5,12,END=60) IR,NN,KODE
       12 FORMAT(5A4,18X,I2,39X,I1)
          NCARD=NCARD+NN
          IF(KODE.EQ.3) GO TO 14
          WRITE(6,13) NCARD,IR
       13 FORMAT(' DECK INCORRECT. CARD:',I5,2X,4A4)
          STOP
       14 DO 40 M1=1,49,6
          M5=M1+4
          M6=M1+5
          DO 15 I=1,5
          K=M1+I-1
          IF(IR(I).NE.ID(1,K)) GO TO 40
       15 CONTINUE
          DO 35 N=2,NN
          READ(5,17) IT
       17 FORMAT(5A4,10X,I2,10X,5A4,10X,I2)
          DO 30 L1=1,7,6
          IF(IT(L1).GT.NIL) GO TO 10
          L6=L1+5
          NT=IT(L6)+1/(IT(L6)+1)
          I2=ID(1,M6)
          IF(I2.EQ.1) GO TO 26
          DO 22 I=2,I2
          DO 21 M=M1,M5
          JJ=M-M1+L1
          IF(IT(JJ).NE.ID(I,M)) GO TO 22
       21 CONTINUE
          ID(I,M6)=ID(I,M6)+NT
          GO TO 30
       22 CONTINUE
       26 I2=I2+1
          DO 29 M=M1,M5
          JJ=M-M1+L1
       29 ID(I2,M)=IT(JJ)
          ID(I2,M6)=NT
          ID(1,M6)=ID(1,M6)+1
       30 CONTINUE
       35 CONTINUE
          GO TO 10
       40 CONTINUE
          DO 41 I = 2,NN
       41 READ (5,42) MOVE
```

PROGRAM FIVE
(Page 2)

```
FORTRAN IV G LEVEL  19                MAIN              DATE = 72118        21/06/37            PAGE 0002

0058           42 FORMAT (A4)
0059              GO TO 10
0060           60 LINE=60
0061              DO 80 M6=6,54,6
0062              M1=M6-5
0063              M5=M6-1
0064              NN=ID(1,M6)
0065              N=NN-1
0066              DO 64 L=2,N
0067              L2=L+1
0068              DO 64 L4=L2,NN
0069              IF(ID(L,M1).LT.ID(L4,M1)) GO TO 64
0070              DO 62 J=M1,M6
0071              KEEP=ID(L,J)
0072              ID(L,J)=ID(L4,J)
0073           62 ID(L4,J)=KEEP
0074           64 CONTINUE
0075              LN=(NN+3)/4+1
0076              IF(LINE+LN.LT.58) GO TO 68
0077              LINE=4
0078              WRITE(6,66) TITLE
0079           66 FORMAT('1'/2X,20A4/)
0080           68 WRITE(6,69) (ID(1,M),M=M1,M5)
0081           69 FORMAT (/2X,5A4)
0082              LINE=LINE+(NN+3)/4+2
0083              WRITE(6,72) ((ID(J,M),M=M1,M6),J=2,NN)
0084           72 FORMAT(4(4X,5A4,2X,I5))
0085           80 CONTINUE
0086              STOP
0087              END
```

PROGRAM SIX
(Page 1)

```
FORTRAN IV G LEVEL  19                MAIN              DATE = 72139        14/46/48            PAGE 0001

0001              DIMENSION TITLE (20),ID(60,1074),IR(5),IT(12),INFO(5,180),
                 1JL(180,5)
0002               LINE=60
0003               DO 2 I=1,180
0004             2 INFO(5,I)=60
0005               READ(5,5) TITLE
0006             5 FORMAT(20A4)
0007               DATA NIL/'ZZZZ'/
0008               DO 8 I=1,180,18
0009               I2=I+17
0010               READ(5,6) ((INFO(L,J),J=I,I2),IPAY,II,L=1,4)
0011             6 FORMAT ( 18I4,A3,I3/18I4,A3,I3/18I4,A3,I3/18I4,A3,I3)
0012             8 CONTINUE
0013             9 LAT=1
0014               NCARD=0
0015            10 READ(5,12,END=53) IR,NN,KODE
0016            12 FORMAT(5A4,18X,I2,39X,I1)
0017               NCARD=NCARD+NN
0018               IF(KODE.EQ.3) GO TO 14
0019               WRITE(6,13) NCARD,IR
0020            13 FORMAT(' DECK INCORRECT. CARD:',I5,2X,4A4)
0021               STOP
0022            14 DO 40 M1=1,LAT,6
0023               M5=M1+4
0024               M6=M1+5
0025               IF(M1.EQ.LAT) GO TO 45
0026               DO 15 I=1,5
0027               K=M1+I-1
0028               IF(IR(I).NE.ID(1,K)) GO TO 40
0029            15 CONTINUE
0030               DO 35 N=2,NN
0031               READ(5,17) IT
0032            17 FORMAT(5A4,10X,I2,10X,5A4,10X,I2)
0033               DO 30 L1=1,7,6
0034               IF(IT(L1).GT.NIL) GO TO 10
0035               L2=L1+4
0036               L6=L1+5
0037               NT=IT(L6)+1/(IT(L6)+1)
0038               I2=ID(1,M6)
0039               DO 22 I=2,I2
0040               DO 21 M=M1,M5
0041               JJ=M-M1+L1
0042               IF(IT(JJ).NE.ID(I,M)) GO TO 22
0043            21 CONTINUE
0044               ID(I,M6)=ID(I,M6)+NT
0045               GO TO 30
0046            22 CONTINUE
0047            24 IF(ID(1,M6).LT.60) GO TO 26
0048               INFO(5,1+M1/6)=INFO(5,1+M1/6)+1
0049               GO TO 30
0050            26 I2=I2+1
0051               DO 29 M=M1,M5
0052               JJ=M-M1+L1
0053            29 ID(I2,M)=IT(JJ)
0054               ID(I2,M6)=NT
0055               ID(1,M6)=ID(1,M6)+1
0056            30 CONTINUE
0057            35 CONTINUE
```

PROGRAM SIX
(Page 2)


```
0058            GO TO 10
0059         40 CONTINUE
0060         45 DO 46 M=M1,M5
0061            JJ=M-M1+1
0062         46 ID(1,M)=IR(JJ)
0063            NZ=1
0064            DO 50 LL=2,NN
0065            READ(5,17) IT
0066            DO 50 L1=1,7,6
0067            IF(IT(L1).GT.NIL)  GO TO 52
0068            NZ=NZ+1
0069            IT(L1+5)=IT(L1+5)+1/(IT(L1+5)+1)
0070            DO 50 M=M1,M6
0071            JJ=M-M1+L1
0072         50 ID(NZ,M)=IT(JJ)
0073         52 ID(1,M6)=NZ
0074            LAT=LAT+6
0075            IF(LAT.LT.1068)GO TO 10
0076         53 DO 54 I1=1,1068,6
0077            LL=ID(1,I1+5)
0078         54 CALL SORT (ID,JL,I1,1,LL)
0079            NT = 1
0080            DO 80 N1 = 1,1062,6
0081            N5=N1+4
0082            N6=N1+5
0083            L9=ID(1,N6)
0084            DO 80 L = 2,L9
0085            IF (ID(L,N1).EQ.0)  GO TO 80
0086            DO 64 J = N1,N5
0087            M=J-N1+1
0088            JL(1,M) = ID(L,J)
0089         64 JL(2,M) = ID(1,J)
0090            LIN = 2
0091            NN=N1+6
0092            DO 70 N11 = NN, 1068,6
0093            N55=N11+4
0094            N66=N11+5
0095            L99=ID(1,N66)
0096            DO 60 LL = 2,L99
0097            IF(ID(LL,N11).EQ.0)  GO TO 60
0098            DO 58 J = N1,N5
0099            M=N11+J-N1
0100            IF (ID(L,J).NE.ID(LL,M)) GO TO 60
0101         58 CONTINUE
0102            LIN = LIN + 1
0103            DO 59 JJ = N11, N55
0104            M=JJ-N11+1
0105         59 JL(LIN,M) = ID(1,JJ)
0106            ID(LL,N11)=0
0107            GO TO 70
0108         60 CONTINUE
0109         70 CONTINUE
0110            IF(LIN.LT.3) GO TO 80
0111            L4 = LIN + 4
0112            L1 = LIN + 1
0113            DO 72 I= L1,L4
0114            DO 72 J= 1,5
0115         72 JL (I,J) = 0
```

```
FORTRAN IV G LEVEL  19                  MAIN              DATE = 72139        14/46/48            PAGE 0003

0116                CALL SORT (ID,JL,1,2,LIN)
0117                NN=LIN
0118                LN=(NN+4)/5+1
0119             71 LINE=LINE+(NN+4)/5+2
0120                IF (LINE+LN.LT.58) GO TO 73
0121                LINE=4
0122                WRITE(6,66) TITLE
0123             66 FORMAT('1' /2X,20A4/)
0124             73 WRITE (6,74) NT,(JL(1,J),J=1,5)
0125             74 FORMAT (/1X,'  TASK:',I3,2X,5A4)
0126                NT = NT + 1
0127                DO 81 J1=2,LIN,5
0128                J5=J1+4
0129             81 WRITE(6,82) ((JL(J,M),M=1,5),J=J1,J5)
0130             82 FORMAT(5X,5(5X,5A4))
0131             80 CONTINUE
0132                LN=ID(1,1068)
0133                WRITE(6,88)
0134             88 FORMAT('1',' LIST OF UNMATCHED TASKS AT END.'//)
0135                DO 85  I=1,LN
0136             85 IF(ID(I,1063).NE.0) WRITE(6,86) I,(ID(I,J),J=1063,1067)
0137             86 FORMAT(/I4,2X,5A4)
0138                STOP
0139                END


FORTRAN IV G LEVEL  19                  SORT

0001                SUBROUTINE SORT(ID,JL,M1,IWAY,LAST)
0002                DIMENSION ID(60,1074),JL(180,5)
0003                LL=LAST-1
0004                M5=M1+4
0005                DO 10 I=2,LL
0006                J1=I+1
0007                DO 10 J=J1,LAST
0008                IF(IWAY.EQ.2) GO TO 7
0009                IF(ID(I,M1).LT.ID(J,M1)) GO TO 10
0010                DO 4 M=M1,M5
0011                KEEP=ID(I,M)
0012                ID(I,M)=ID(J,M)
0013             4  ID(J,M)=KEEP
0014                GO TO 10
0015             7  IF(JL(I,M1).LT.JL(J,M1)) GO TO 10
0016                DO 8 M=M1,M5
0017                KEEP=JL(I,M)
0018                JL(I,M)=JL(J,M)
0019             8  JL(J,M)=KEEP
0020            10  CONTINUE
0021                RETURN
0022                END
```

PROGRAM SEVEN

```
FORTRAN IV G LEVEL  19                MAIN                DATE = 72139        14/32/10            PAGE 0001

0001              DIMENSION IN(76), L(7,71),TAG(152),LB(3)
0002              DATA LB/'LOC ','SIZE','SUM '/
0003                 DO 1 I=1,7
0004                 DO 1 J=1,71
0005               1 L(I,J)=0
0006                 NCARD = 0
0007                 READ (5,2) TAG
0008              2  FORMAT (20A4)
0009              4  NCARD = NCARD + 2
0010                 READ (5,5, END = 20) IN
0011              5  FORMAT (20I2,2X,17I2,I1,2X,I1/20I2,2X,15I1,12X,I1,9X,I1)
0012                 IF (IN(76)/IN(39).EQ.2)  GO TO 8
0013                 WRITE (6,6) NCARD, IN
0014              6  FORMAT(2X,'DECK DISORDERED, NCARD:   ',I5/2X,60I2)
0015              8  NUM = IN(37)
0016                 LOC = IN(38)
0017                 MASS = IN(75) + 1
0018                 DO 9 I = 60,73
0019              9  IF (IN(I).EQ.2)  IN(I) = 0
0020                 DO 10 I = 1,71
0021                 K=I+3*(I/37)
0022                 L(LOC,I) = L(LOC,I) + IN(K)
0023              10 L(MASS,I) = L(MASS,I) + IN(K)
0024                 GO TO 4
0025              20 CONTINUE
0026                 WRITE (6,25) (TAG (I), I=1,20)
0027              25 FORMAT ('1',2X,20A4//)
0028                 DO 28 I = 1,2
0029                 DO 28 J = 1,71
0030              28 L(7,J) = L(7,J) + L(I,J)
0031                 DO 50 J1 = 1,71,28
0032                 J2 = MIN0(J1 + 27,71)
0033                 M1 = J1 + 20
0034                 M2 = M1 + 27
0035                 IF (J1.LT.57) WRITE (6,32) (TAG (M),M=M1,M2)
0036              32 FORMAT (14X,28A4)
0037                 IF(J1.LT.57) WRITE(6,33) ((J,J=1,4),I=1,7)
0038                 IF(J1.EQ.57) WRITE(6,33) (J,J=1,15)
0039              33 FORMAT (9X,28I4/)
0040                 DO 35 I = 1,7
0041                 IL= (I + 5) /4
0042                 II = I - (I+1) / 4
0043              35 WRITE (6,36) LB(IL),II,(L(I,J),J=J1,J2)
0044              36 FORMAT (2X,A4,I2,2X,28I4)
0045                 WRITE (6,38)
0046              38 FORMAT (/' LEGEND:'/)
0047                 IF (J1.EQ.57) GO TO 42
0048                 DO 39 I1 =137,152,4
0049                 I2 = I1 + 3
0050                 LL = (I1 -137) / 4 + 1
0051              39 WRITE (6,40) LL, (TAG(I),I = I1,I2)
0052              40 FORMAT (4X,I2,2X,4A4)
0053                 WRITE(6,41)
0054              41 FORMAT(//)
0055                 GO TO 50
0056              42 DO 45  I1 = 77,96,4
0057                 K1=I1+20
0058                 M1=I1+40

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0059                 I4=I1+3
0060                 K4=K1+3
0061                 M4=M1+3
0062                 N1=(I1-77)/4+1
0063                 N6=N1+5
0064                 N11=N1+10
0065              45 WRITE(6,46) N1,(TAG(I),I=I1,I4),N6,(TAG(K),K=K1,K4),
                    1   N11,(TAG(M),M=M1,M4)
0066              46 FORMAT (3(I6,2X,4A4))
0067              50 CONTINUE
0068                 WRITE(6,55)
0069              55 FORMAT('1')
0070                 STOP
0071                 END
```

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